## QUEENS ANIMAL SHELTER AND CARE CENTER 151 WOODWARD AVENUE QUEENS, NEW YORK

# SITE MANAGEMENT PLAN

NYSDEC Site Number: C241230 AKRF Project Number: 180291

## **Prepared for:**

New York State Department of Environmental Conservation Division of Environmental Remediation, Remedial Bureau B 625 Broadway, 12<sup>th</sup> Floor Albany, New York 12233

## **On Behalf Of:**

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## **Revisions to Final Approved Site Management Plan:**

Revision	Date		NYSDEC
No.	Submitted	Summary of Revision	<b>Approval Date</b>
1	6/10/2024	Groundwater analytical method revision	

## **CERTIFICATION STATEMENT**

I, **Michelle Lapin**, P.E., certify that I am currently a New York State registered Professional Engineer (P.E.) as defined in 6 New York Codes, Rules and Regulations (NYCRR) Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).



Michelle Lapin, P.E. NYS Professional Engineer #073934-1

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## LIST OF ACRONYMS

Acronym	Definition	
ASTM	American Society for Testing and Materials	
AWQSGVs	Ambient Water Quality Standards and Guidance Values	
BCA	Brownfield Cleanup Agreement	
ВСР	Brownfield Cleanup Program	
bgs	Below Ground Surface	
BMS	Building Management System	
BTEX	A group of VOCs comprising benzene, toluene, ethylbenzene, and xylenes	
C&D	Construction and Demolition	
CAMP	Community Air Monitoring Plan	
CFM	Cubic Feet per Minute	
CFR	Code of Federal Regulations	
CoC	Chain of Custody	
COC	Certificate of Completion	
СР	Commissioner's Policy	
СРР	Citizen Participation Plan	
CSCO	Commercial Soil Cleanup Objective	
DD	Decision Document	
DER	Division of Environmental Remediation	
DUSR	Data Usability Summary Report	
EC	Engineering Control	
ECL	Environmental Conservation Law	
ELAP	Environmental Laboratory Approval Program	
EPA	United States Environmental Protection Agency	
ESA	Environmental Site Assessment	
ESC	Environmental Studies Corporation	
ESI	Environmental Site Investigation	
EWP	Excavation Work Plan	
ft bgs	Feet Below Ground Surface	
GPA	Gas-permeable Aggregate	
HASP	Health and Safety Plan	
HDPE	High-density Polyethylene	
IC	Institutional Control	
in H2O	Inches of Water	
ISCO	In-Situ Chemical Oxidation	
MFR	Modified Fenton's Reagent	
mg/kg	Milligrams per Kilogram	
MP	Monitoring Point	
MS	Matrix Spike	
MSD	Matrix Spike Duplicate	
msl	Mean Sea Level	

Acronym	Definition	
MTBE	Methyl Tert Butyl Ether	
MW	Monitoring Well	
NY	New York	
NYC	New York City	
NYCDOHMH	New York City Department of Health and Mental Hygiene	
NYCRR	New York Codes, Rules and Regulations	
NYS	New York State	
NYSDEC	New York State Department of Environmental Conservation	
NYSDOH	New York State Department of Health	
NYSDOT	New York State Department of Transportation	
РАН	Polycyclic Aromatic Hydrocarbon	
РСВ	Polychlorinated Biphenyl	
PE	Professional Engineer	
PFAS	Per- and Polyfluoroalkyl Substances	
PGWSCO	Protection of Groundwater Soil Cleanup Objective	
PID	Photoionization detector	
ppm	Parts per Million	
PRR	Periodic Review Report	
psi	Pounds per Square Inch	
PVC	Polyvinyl Chloride	
QA	Quality Assurance	
QACC	Queens Animal Shelter and Care Center	
QAPP	Quality Assurance Project Plan	
QC	Quality Control	
QEP	Qualified Environmental Professional	
QHHEA	Qualitative Human Health Exposure Assessment	
RAO	Remedial Action Objective	
RAWP	Remedial Action Work Plan	
REC	Recognized Environmental Condition	
RI	Remedial Investigation	
RIR	Remedial Investigation Report	
RIWP	Remedial Investigation Work Plan	
RSO	Remedial Site Optimization	
SB	Soil Boring	
scfm	Standard Cubic Feet per Minute	
SCG	Standard, Criteria, and Guidance	
SIM	Selective Ion Monitoring	
SMP	Site Management Plan	
SPDES	State Pollutant Discharge Elimination System	
SRI	Supplemental Remediation Investigation	
SRIR	Supplemental Remedial Investigation Report	

Acronym	Definition
SSDS	Sub-slab Depressurization System
SV	Soil Vapor
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TOGS	Technical Operational and Guidance Series
UST	Underground Storage Tank
UUSCOs	Unrestricted Use Soil Cleanup Objective
VFD	Variable Frequency Drive
VMP	Vapor Monitoring Point
VOC	Volatile Organic Compound
µg/L	Micrograms per Liter
$\mu g/m^3$	Micrograms per Cubic Meter

## **EXECUTIVE SUMMARY**

Table I provides a brief summary of the controls implemented for the property, as well as the inspections, monitoring, maintenance, and reporting activities required by this Site Management Plan (SMP).

	Site No. C241230		
	Oueens Animal Shelter and Care Center		
Site Identification	151 Woodward Avenue (also referred to as 1906 Flushing Avenue)		
	Queens, New York		
	1. The property may be used for commercial and industrial uses		
	only, as set forth in the Environmental Easement.		
	2. All Engineering Controls (ECs) must be operated and maintained		
	as specified in the SMP.		
	3. All ECs must be inspected at a frequency and in a manner		
	defined in the SMP.		
	4. The use of groundwater underlying the property is prohibited without pagagany water quality treatment as determined by the		
	New York State Department of Health (NVSDOH) or the New		
	York City Department of Health and Mental Hygiene		
	(NYCDOHMH) to render it safe for use as drinking water or for		
	industrial purposes, and the user must first notify and obtain		
	written approval to do so from the New York State Department		
	of Environmental Conservation (NYSDEC).		
	5. Groundwater and other environmental or public health		
	monitoring must be performed as defined in the SMP.		
Institutional Controls (ICs)	6. Data and information pertinent to Site Management of the		
· · · · ·	property must be reported at the frequency and in a manner		
	7 All future activities on the property that will disturb remaining		
	contaminated material must be conducted in accordance with the		
	SMP.		
	8. Monitoring to assess the performance and effectiveness of the		
	remedy must be performed as defined in the SMP.		
	9. Operation, maintenance, inspection, and reporting of the		
	mechanical or physical components of the remedy shall be		
	performed as defined in the SMP.		
	10. Access to the property must be provided to agents, employees,		
	or other representatives of the State of New York with		
	compliance with the restrictions identified in the Environmental		
	Easement		
	11. In-ground vegetable gardens and farming on the property are		
	prohibited.		
	1. Site Cover System.		
<b>Engineering Controls (ECs)</b>	2. Active Sub-Slab Depressurization System (SSDS).		
	3. Biosparge System.		

Table ISite Management Plan Summary

Inspections	Frequency		
Site Cover System Inspection	Annually.		
Active SSDS Inspection	Quarterly for the first year, and annually thereafter.		
Biosparge System Inspection	Monthly for first quarter, and quarterly thereafter.		
Groundwater Monitoring	Quarterly for first year. Frequency after the first year will be included in the First PRR		
Reporting	Frequency		
Deriodic Deview Deport (DDD)	First PRR, 18 months after receipt of the Certificate of		
renound Review Report (FRR)	Completion (COC). Subsequent PRRs, annually.		

Further descriptions of the above requirements are provided in detail in the latter sections of this SMP.

## **1.0 INTRODUCTION**

#### 1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Queens Animal Shelter and Care Center (QACC) located at 151 Woodward Avenue in Queens, New York (hereafter referred to as the Site). The Site, which is identified as Tax Block 3376, Lot 1 on the New York City (NYC) Tax Map, is currently enrolled in the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C241230, which is administered by the New York State Department of Environmental Conservation (NYSDEC). A Site Location map is provided as Figure 1.

Animal Care and Control of New York City, Inc. entered into a Brownfield Cleanup Agreement (BCA) (Index No. C241230-03-19) with NYSDEC on April 1, 2019, to remediate the Site. The BCA was amended on January 22, 2021 to reflect a change in ownership and add 1906 Flushing LLC to the BCA. A Site Plan is shown on Figure 2, and the Site boundaries are fully described in the metes and bounds Site description that is part of the Environmental Easement provided in Appendix A.

After completion of the remedial work, some contamination was left at the Site, which is hereafter referred to as "remaining contamination." Institutional and Engineering Controls (ICs/ECs) have been incorporated into the Site remedy to control exposure to remaining contamination and ensure protection of public health and the environment. An Environmental Easement granted to NYSDEC and recorded with the Queens County Clerk requires compliance with this SMP and all ICs/ECs placed on the Site.

This SMP was prepared to manage remaining contamination at the Site until the Environmental Easement is extinguished, in accordance with Environmental Conservation Law (ECL) Article 71, Title 36. This plan has been approved by NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor's successors and assigns. This SMP may only be revised with the approval of NYSDEC.

It is important to note that:

- This SMP details the Site-specific implementation procedures that are required by the Environmental Easement. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC); and
- Failure to comply with this SMP is also a violation of ECL 6 New York Codes, of Rules and Regulations (NYCRR) Part 375 and the BCA for the Site, and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting NYSDEC or its successor agency managing environmental issues in NYS. Contact information for persons involved with the Site is provided in Appendix B of this SMP.

This SMP was prepared by AKRF Inc. (AKRF), on behalf of the Volunteers, in accordance with the requirements of NYSDEC's Division of Environmental Remediation (DER) -10 (DER-10) (Technical Guidance for Site Investigation and Remediation), and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the ICs/ECs that are required by the Environmental Easement for the Site. The responsibilities of the owner and remedial party are included as Appendix C.

## **1.2** Revisions and Alterations

Revisions and alterations to this plan will be proposed in writing to the NYSDEC Project Manager. NYSDEC can also make changes to the SMP or request revisions from the Site owner or "remedial party." Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shutdown of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant changes to the Site conditions. All approved alterations must conform with Article 145 Section 7209 of the Education Law regarding the application of professional seals and alterations. For example, any changes to as-built drawings must be stamped by a New York State Professional Engineer. In accordance with the Environmental Easement for the Site, the NYSDEC Project Manager will provide a notice of any approved changes to the SMP and append these notices to the SMP that is retained in its files.

## 1.3 Notifications

Notifications will be submitted by the property owner to NYSDEC, as needed, in accordance with NYSDEC's DER-10, for the following reasons:

- 1. Sixty-day advance notice of any proposed changes in Site use that are required under the terms of the BCA Index No. C241230-03-19, 6 NYCRR Part 375, and/or ECL;
- 2. Seven-day advance notice of any field activity associated with the remedial program;
- 3. Fifteen-day advance notice of any proposed ground-intrusive activity, pursuant to the Excavation Work Plan (EWP). If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required;
- 4. Notice within 48 hours of any damage or defect to the foundation, structures, or ECs that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect;
- 5. Notice within 48 hours of any non-routine maintenance activities;
- 6. Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake, that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public; and
- 7. Follow-up status reports submitted to NYSDEC within 45 days describing and documenting the actions taken to respond to any emergency event requiring ongoing responsive action, and the actions to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- 8. At least 60 days prior to the change, NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/remedial party has been provided with a copy of the BCA and all approved work plans and reports, including this SMP; and
- 9. Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to NYSDEC.

Table II includes contact information for the above notifications. The information will be updated as necessary. A full listing of Site-related contact information is provided in Appendix B.

i o i				
Agency	Name, Role	<b>Contact Information</b>	<b>Required Notification<sup>2</sup></b>	
NYSDEC	Michael MacCabe, Project Manager	(518) 402-9687	All Notifications	
NYSDEC	Sarah Quandt, Section Chief	(518) 402-9116	All Notifications	
NYSDEC	Jane O'Connell, Regional Chief	(718) 482-4599	All Notifications	
NYSDOH	Steven Berninger, Project Manager	(518) 402-7860	Notifications 4, 6, and 7	
Notes:				

Table IIKey Regulatory Contacts1

<sup>1</sup>Contacts are subject to change and will be updated as necessary.

<sup>2</sup> Numbers in this column reference the numbered bullets in the notification list in this section.

## 2.0 SITE BACKGROUND AND PREVIOUS INVESTIGATIONS

### 2.1 Site Location and Description

The Site is located in Ridgewood, Queens County, New York and is identified as Block 3376, Lot 1 on the NYC Tax Map. The Site is currently zoned M1-1. The Site is an approximately 0.986acre area bounded to the north by a shelving warehouse and distribution facility; to the east by Troutman Street, followed by a parking lot, unspecified storage, and multi-family residential buildings; to the south by Woodward Avenue, followed by residential and commercial buildings and a gasoline station; and to the west by Flushing Avenue, followed by mixed-use buildings with street-level commercial uses (auto repair/tire shop and deli) and an auto storage/junk yard (see Figure 1 for a Site Location Map.) The boundaries of the Site are more fully described in the Environmental Easement (Appendix A).

The owner of the Site at the time of issuance of this SMP is 1906 Flushing LLC.

#### 2.2 Physical Setting

#### 2.2.1 Land Use

The Site is currently being redeveloped into a new three-story slab-on-grade animal shelter and care center. The animal shelter and care center are part of the NYC Mayor's initiative to provide full-service animal shelters and care centers in each borough. The new facility will include animal housing and medical facilities, work/office spaces, and a rooftop terrace. An asphalt-paved visitors' parking lot will be located in the northern portion of the Site along Flushing Avenue, and a concrete-paved employee parking lot will be located on the second floor along Troutman Street. The new building will front Flushing Avenue with entrances along Flushing Avenue and Troutman Street.

The properties adjoining the Site are commercial and residential. The surrounding neighborhood is primarily developed with commercial and residential properties, with some industrial uses. The properties to the immediate south and east of the Site include primarily residential and commercial properties, and the properties to the immediate west and north of the Site include primarily industrial and commercial properties, with some mixed-use residential properties.

## 2.2.2 Geology

Based on a Site elevation survey prepared by Empire State Land Surveyor, P.C. in August 2021, the sidewalk elevation surrounding the Site ranges from 26.36 feet above the North American Vertical Datum of 1988 (NAVD88) at the intersection of Woodward Avenue and Flushing Avenue (the southeast corner of the Site) to 41.47 feet at the intersection of Troutman Street and Woodward Avenue (the northwest corner of the Site). During the implementation of the remedial action, the elevation of the Site was brought down to grade along Flushing Avenue, or approximately 27.5 feet. The Site survey performed for the environmental easement is included in Appendix A. During the Remedial Investigation (RI) and Supplemental Remedial Investigation (SRI), a total of 14 soil borings were advanced at the Site or within Site-adjacent sidewalks along Flushing Avenue, Woodward Avenue, and Troutman Street. Soil observed in the borings during the RI and SRI consisted of fill comprising sand, silt, and gravel with varying amounts of concrete, brick, wood, coal, ash, metal shards, and roots extending from grade to between 6 and 24 feet below grade. At a minimum, the upper one foot of soil and fill was excavated from the Site during remedial activities. Bedrock was not

encountered during the implementation of the remedy. Soil boring logs from the RI and SRI are provided in Appendix D.

## 2.2.3 Hydrogeology

Depth to groundwater beneath the Site ranges from approximately 9 to 20 feet below sidewalk grade or between approximately 21.91 to 16.76 feet NAVD88 and flows in a generally northwesterly direction.

A groundwater contour map is shown on Figure 3. Groundwater elevation data is provided in Table 1. Groundwater monitoring well construction logs from wells installed and sampled during the RI and SRI are provided in Appendix D.

## 2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References. Copies of all reports and documents referenced were placed in the Site document repositories.

## Phase II Environmental Site Investigation, 151 Flushing Avenue, Soil Mechanics, December 2008

Based on the results of a May 2007 Phase I Environmental Site Assessment (ESA) (not provided for review but summarized in this report), Soil Mechanics conducted a subsurface investigation at the Site on behalf of 59-15 Holding Corp. (one of the previous property owners). The scope of work included the advancement of eight soil borings, installation of three temporary groundwater wells, and collection and analysis of eight soil samples and three groundwater samples. Findings of the investigation included the following:

- Numerous volatile organic compounds (VOCs) were detected in soil above their respective NYSDEC 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs). Detected semivolatile organic compounds (SVOCs) primarily included polycyclic aromatic hydrocarbons (PAHs), which are commonly found in fill material in NYC. Chromium, cadmium, mercury, and lead were detected above their respective UUSCOs, but below their respective commercial Use Soil Cleanup Objectives (CSCOs), in several samples.
- The VOC methyl tert-butyl ether (MTBE) was detected above its NYSDEC Technical and Operational Guidance Series (TOGS) (1.1.1): Class GA Ambient Water Quality Standard and Guidance Value (AWQSGV) of 10 micrograms per liter (µg/L) in each of three groundwater samples at concentrations ranging from 111 µg/L to 1,557 µg/L. Arsenic, barium, chromium, mercury, and lead were detected above their respective AWQSGVs in the groundwater samples.

## Phase I ESA, 151 Woodward Avenue, Environmental Studies Corporation, May 2018

A Phase I ESA of the Site was prepared by Environmental Studies Corporation (ESC) in May 2018 on behalf of Animal Care and Control of NYC, Inc. The Phase I ESA was performed in conformance with American Society for Testing and Materials (ASTM) Standard E1527-13, Standard Practice for ESAs: Phase I ESA Practice. The report identified the following Recognized Environmental Conditions (RECs):

- The presence of contaminants in excess of regulatory standards and guidelines found in soil and groundwater samples collected at the Site in 2008;
- The potential for additional contaminated soil and groundwater at the Site from current and historic automobile maintenance, wrecking, and salvage operations;

- The possible presence of one or more out-of-service petroleum underground storage tanks (USTs) that had not been closed or removed in accordance with applicable regulations; and
- The potential for groundwater contamination from off-site sources in the immediate vicinity of the Site.

#### Phase II Environmental Site Investigation (ESI), 151 Woodward Avenue, ESC, June 2018

Based on the results of the May 2018 Phase I ESA, ESC conducted a subsurface investigation at the Site on behalf of the Volunteer. The scope of work included a geophysical survey, the advancement of six soil borings, the installation of two temporary groundwater wells, the installation of two temporary soil vapor points, and collection and analysis of six soil samples, two groundwater samples, and two soil vapor samples. The findings of the investigation are summarized below:

- The geophysical survey identified an oil-water separator tank in the Tire Wheel and Glass Depot building located on Flushing Avenue. The report did not indicate the specific location of the tank.
- Petroleum-related VOCs, including 1,2,4-trimethylbenzene, ethylbenzene, total xylenes, and 2-butanone, were detected above their respective UUSCOs in several soil samples.
- PAHs, including benzo(a)pyrene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene, were detected above their respective UUSCOs in several soil samples. Benzo(a)pyrene was also detected above its CSCO in one soil sample located in the central portion of the Site.
- Lead and mercury were detected above the UUSCOs, but below the CSCOs, in several soil samples.
- The VOC MTBE was detected in both groundwater samples at concentrations of 260 µg/L and 240 µg/L, exceeding its AWQSGV of 10 µg/L. Two SVOCs, diethyl phthalate and 2,6-dinitrotoluene, were detected above their respective AWQSGVs.
- Several petroleum-related compounds were detected in the two soil vapor samples collected at the Site. In addition, trichloroethylene (TCE) was detected at a concentration of 170 micrograms per cubic meter ( $\mu$ g/m<sup>3</sup>) and cis-1,2-dichloroethylene was detected at a concentration of 90  $\mu$ g/m<sup>3</sup> in sample SV-1. Both chlorinated solvent compounds are included on the New York State Department of Health (NYSDOH) Soil Vapor/Indoor Air Matrices.

#### Supplemental Phase II Environmental Site Investigation, AKRF, September 2018

AKRF conducted a Supplemental Subsurface (Phase II) Investigation to further investigate whether current and historical uses at the Site had adversely affected the Site's subsurface. The scope of the investigation was based on the findings of the Phase I ESA and Phase II Site Investigation conducted at the Site by ESC in May and June 2018, respectively. Field activities included the advancement of seven soil borings with the collection and analysis of nine soil samples and the installation of three temporary groundwater monitoring wells with the collection and analysis of three groundwater samples. The findings of the investigation are summarized below:

 The VOCs benzene, ethylbenzene, toluene, and total xylenes (collectively referred to as BTEX) and acetone were detected above their respective UUSCOs, but below their respective CSCOs, in up to five shallow soil samples. The VOCs m,p-xylenes and MTBE were detected in groundwater at concentrations above their AWQSGVs of 5 μg/L and 10 μg/L, respectively. MTBE was detected in both groundwater samples at concentrations of 260  $\mu g/L$  and 240  $\mu g/L.$ 

- Two SVOCs were detected above their respective CSCOs in two soil samples: benzo(a)pyrene was detected above its CSCO of 1 milligram per kilogram (mg/kg) in two samples at concentrations of 4.2 mg/kg and 1.3 mg/kg, respectively, and dibenz(a,h)anthracene was detected above its CSCO of 0.56 mg/kg in one soil sample at a concentration of 1 mg/kg. The detected concentration of phenol (5.5  $\mu$ g/L) in one groundwater sample exceeded the AWQSGV of 1.0  $\mu$ g/L.
- Two metals were detected in two soil samples above CSCOs. Mercury was detected in one sample at a concentration of 3.3 mg/kg, above the CSCO of 2.8 mg/kg, and copper was detected in another sample at a concentration of 391 mg/kg, above the CSCO of 270 mg/kg. Arsenic, barium, chromium, iron, lead, magnesium, manganese, mercury, and selenium were also detected above their respective AWQSGVs.
- Total polychlorinated biphenyls (PCBs) were detected in one soil sample at a concentration of 8.7 mg/kg, above the CSCO of 1 mg/kg.

The report concluded that the petroleum-related VOCs and SVOCs, and the PCBs, detected in the shallow soil/fill and in the groundwater samples were likely related to current and historical automobile uses as the Site. The PAHs detected in soil, as well as detections of metals that exceeded the UUSCOs and/or CSCOs in shallow soil samples, were likely related to historic fill at the Site. The report also noted that iron and manganese are earthen metals that are expected to be present within the aquifer and are generally not attributable to a Site-related discharge.

#### <u>BCP Application, Queens Animal Shelter and Care Center, Queens, New York, AKRF, March</u> 2019

AKRF prepared a BCP Application for the Site in March 2019, which discussed soil, groundwater, and soil vapor contamination associated with the Site's former uses. The Site was entered into the BCP in April 2019 (BCA Index No. C241230-03-19).

## Citizen Participation Plan (CPP), Queens Animal Shelter and Care Center, Queens, New York, AKRF, May 2019

AKRF prepared a CPP for the Site in May 2019, which provided details on major issues of public concern related to the Site and surrounding areas. The CPP provided this information to the public and encouraged citizen involvement in decisions being made about the Site that regarded their health.

## <u>Remedial Investigation Work Plan (RIWP), Queens Animal Shelter and Care Center, Queens,</u> <u>New York, AKRF, May 2019</u>

AKRF prepared an RIWP, a Quality Assurance Project Plan (QAPP), and an associated Health and Safety Plan (HASP) for the Site in May 2019. The work plan proposed the advancement of 14 soil borings with the collection and laboratory analysis of up to 4 soil samples from each boring, the installation of 10 permanent groundwater monitoring wells with the collection and analysis of 10 groundwater samples, and the installation of 7 temporary soil vapor points with the collection and safety measures to be followed during implementation of the investigation. The RIWP was approved by NYSDEC on June 4, 2019.

## <u>Remedial Investigation Report (RIR), Queens Animal Shelter and Care Center, Queens, New</u> <u>York, AKRF, October 2019</u>

AKRF prepared an RIR in October 2019 that reported on RI sampling conducted at the Site in December 2018 and June 2019. The investigation consisted of: the advancement of 25 soil borings with the collection and laboratory analysis of 81 soil samples; the collection of one sludge sample; the installation of 10 permanent groundwater monitoring wells with the collection and laboratory analysis of 7 soil vapor samples. A Geoprobe® direct-push probe equipped with a 2-inch-diameter macrocore sampler was used to advance the soil borings and install the soil vapor points.

Historic fill material (comprising sand, silt, and gravel with varying amounts of concrete, brick, wood, coal, ash, metal shards, and roots) extended from grade to between 6 and 24 feet below grade surface (bgs) across the Site. The historic fill was underlain by apparent native sand, gravel, and silt to boring termination depths (up to 24.5 feet bgs). Groundwater was encountered at depths between approximately 12.5 and 20 feet bgs. Soil samples were screened for VOCs with a photoionization detector (PID). Field evidence of contamination, including petroleum-like odors, dark staining, and/or elevated PID readings, was encountered in multiple soil borings across the Site. Elevated PID readings were observed in most of the soil borings at concentrations ranging from 0.4 parts per million (ppm) to 162.8 ppm. Bedrock was not encountered during the RI.

During the December 2018 sampling, 43 soil samples were submitted for laboratory analysis. Up to four soil samples were collected from each soil boring location: one soil sample was collected from the interval beneath the Site-wide concrete cap (approximately 2 feet below existing grade surface), a second sample was collected from the proposed new building foundation depth (between approximately 5 and 12 feet bgs), and a third sample was collected from the 2-foot interval directly above the groundwater interface (between approximately 10 and 18 feet bgs). A fourth sample was collected from RI-SB-06 at 5 to 7 feet bgs based on visual evidence of contamination that did not correspond with the shallower interval, foundation depth, or groundwater interface. During the June 2019 sampling, 38 samples were submitted for laboratory analysis. Three to four soil samples were collected from each soil boring. One soil sample was collected from the interval beneath the Site-wide concrete cap (approximately two feet below existing grade surface). A second sample was collected between approximately two and eight feet below existing grade surface across the Site, and a third sample was collected from the interval solution depth.

Soil samples were submitted to TestAmerica, Inc. (TestAmerica) of Edison, New Jersey, a NYSDOH Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, in accordance with United States Environmental Protection Agency (EPA) chain of custody (CoC) protocol. The December 2018 soil samples and sludge sample were analyzed by for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, pesticides by EPA Methods 8081 and 8151A, PCBs by EPA Method 8082, Target Analyte List (TAL) metals by EPA Method 6000/7000 series, and hexavalent chromium by EPA Method 7196A. The June 2019 soil samples were analyzed for 1,4-dioxane by EPA Method 8270D selected ion monitoring (SIM), and per- and polyfluoroalkyl substances (PFAS) by EPA Method 537 (modified).

The groundwater samples were analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, pesticides by EPA Methods 8081 and 8151A, PCBs by EPA Method 8082, TAL total and dissolved metals by EPA Method 6000/7000 series, 1,4-dioxane by EPA Method 8270C SIM, and the 21-compound list of PFAS by Modified EPA Method 537. Soil vapor samples were

analyzed for VOCs by EPA Method TO-15. Soil sample results were compared to the NYSDEC 6 NYCRR Part 375 UUSCOs and CSCOs. Groundwater samples were compared to AWQSGVs.

The RI documented fill Site-wide from surface grade down to between 6 and 24.5 feet below grade (into the groundwater table in some places), which contained elevated concentrations of VOCs, SVOCs, PCBs, PFAS, and metals. VOC and SVOC concentrations above the UUSCOs, CSCOs, and/or Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) were detected primarily in the top two feet of soil at the Site, with only xylenes detected above UUSCOs in two deeper samples. Field evidence of contamination, including petroleum-like odors, dark staining, and/or elevated PID readings, was encountered in the subsurface across the Site. The highest total concentrations of VOCs were detected in soil borings RI-SB-05, RI-SB-06, and RI-SB-09, which were located in the southern and eastern portions of the Site. Detected concentrations of VOCs and SVOCs in soil likely reflected the historical use of the Site for auto wrecking and salvage. Additionally, total metals and PCBs were detected in shallow and deep samples throughout the Site. The highest total concentrations of metals were detected in the shallow soil sample collected from RI-SB-04 and the sample collected from RI-SB-12 (between 9 and 11 feet bgs). These borings were located in the central and northern portions of the Site. RI-SB-12 was located in a section of the Site designated for auto part storage and repair. PFAS was also detected across the Site at variable concentrations down to 25 feet bgs. The highest concentration was detected in shallow soil (0 to 2 feet) along the Flushing Avenue-adjacent Site boundary. Historical auto wrecking and salvage operations were deemed to have contributed to the detected concentrations.

The sludge sample (RI-SL-01\_20181204) was collected from a location where sludge on the concrete surface was most prevalent, where most of the wrecked cars' engines were drained and dismantled. The laboratory detections were consistent with field observations, which were used to determine that historic fill was present from surface grade to between approximately 6 and 24 feet bgs across the entire Site.

Petroleum-related VOCs (BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and MTBE) were detected above the AWQSGVs in each of the groundwater samples collected. Metals were also detected at concentrations above their respective AWQSGVs in groundwater. Total metals, including beryllium, chromium, lead, nickel, and thallium, were detected at elevated concentrations in groundwater samples; however, these metals were not detected at elevated concentrations in the dissolved metals samples, and were detected in soil samples collected throughout the Site. Therefore, these detections were likely the result of sediment entrained in the samples. The metals manganese, magnesium, and sodium were detected in both the total and dissolved samples; thus, the elevated concentrations are most likely related to regional groundwater conditions as opposed to an on-site release, because these metals are common constituents in native soil and bedrock in the region. PFAS was detected in all of the groundwater samples, with the highest concentration found in the central portion of the Site. The presence of PFAS in groundwater was likely the result of historical automobile wrecking operations, as well as off-site industrial uses on surrounding properties.

Petroleum and chlorinated-solvent related VOCs were detected at elevated concentrations in all of the soil vapor samples collected. The concentrations of VOCs in soil vapor are likely related to the current and historical automobile wrecking operations at the Site. The compound 2,2,4trimethylpentane (also known as isooctane) was found at very high concentrations in the soil vapor. Isooctane is an additive mixed into gasoline to increase the knock resistance of fuel and is typically added along with n-heptane. Due to the detection of these contaminates, a direct correlation of the on-site contamination to automobile wrecking and salvage operations was concluded.

## Supplemental Remedial Investigation Report (SRIR), Queens Animal Shelter and Care Center, Queens, New York, AKRF, November 2019

AKRF conducted an SRI to inform the Site's Qualitative Human Health Exposure Assessment (QHHEA) and determine whether petroleum-related contamination identified during AKRF's October 2019 RI was migrating off-site in November 2019. The scope included the installation of three permanent 2-inch-diameter groundwater monitoring wells on sidewalks adjacent to the Site along Flushing Avenue, Woodward Avenue, and Troutman Street, with the collection and laboratory analysis of three groundwater samples; the installation of three temporary soil vapor probes co-located with the permanent monitoring wells, with the collection and laboratory analysis of three soil vapor samples; and the performance of a groundwater monitoring wells.

Based on the SRI results, contaminated groundwater and soil vapor were identified in the subsurface adjacent to the Site. MTBE was detected above the AWQSGV in groundwater sample SRI-MW-13\_20190830 at a concentration of 56  $\mu$ g/L. MTBE was also detected in groundwater sample SRI-MW-11\_20190830 below the AWQSGV. MTBE was detected in groundwater samples collected during the December 2018 RI from 8 of the 10 on-site groundwater monitoring wells, with concentrations ranging from non-detect in one well (RI-MW-03) in the western portion of the Site to 4,300  $\mu$ g/L (RI-MW-06) in the center of the Site. Although relatively low concentrations of MTBE were detected in two off-site wells, their presence may be indicative of off-site migration of groundwater contamination or related to off-site sources. The detected concentrations of petroleum-related VOCs off-site were highest in sample SV-11\_20190731, and based on the similar concentrations detected in the nearby on-site soil vapor point (RI-SV-02\_20181210), this may be indicative of a potential preferential pathway for off-site migration of soil vapor. Preferential pathways may be present due to anomalies in the subsurface, such as utility trenches and variations in geology.

The metals antimony, iron, manganese, magnesium, and sodium were detected above their respective AWQSGVs in groundwater (total) analyses in one or more of the off-site groundwater samples; and iron, manganese, magnesium, and sodium were detected above their respective AWQSGVs in groundwater (dissolved) analyses in one or more of the off-site samples. The metals detected and the concentrations of the detected metals were similar to groundwater samples collected from the on-site monitoring wells. The elevated concentrations of metals in on- and- off-site groundwater samples were deemed most likely related to regional groundwater conditions as opposed to an on-site release, because these metals are common constituents in native soil and bedrock in the region.

## <u>Remedial Action Work Plan (RAWP), Queens Animal Shelter and Care Center, Queens, NY,</u> <u>AKRF, October 2019</u>

AKRF prepared a RAWP in October 2019, which outlined the remedial activities and cleanup objectives for the Site. The RAWP proposed removal of the source of petroleum contamination, which would include any USTs, fill ports, vent pipes, and other associated piping, and excavation and off-site disposal of petroleum-contaminated soil/fill between grade and 7 feet bgs at the source area in the central portion of the Site and from grade to 1 foot bgs throughout the remainder of the Site, in accordance with applicable federal, state, and local laws and regulations as defined by 6 NYCRR Part 375-6.8. The remedy also included the installation of ICs/ECs, including the installation of a Site Cover system, an active sub-slab depressurization system (SSDS), and a contingent groundwater treatment program integrated into the proposed building design as part of construction.

RAWP approval and the NYSDEC Decision Document (DD) were both issued in November 2019.

Groundwater Treatment Design Report, Queens Animal Shelter and Care Center, Queens, NY, AKRF, January 2020

AKRF prepared a Groundwater Treatment Design Report to summarize the results of a treatability study and further describe the in-situ groundwater treatment program to be implemented at the Site in accordance with the NYSDEC-approved RAWP and DD.

The Bench-Scale Treatability Study was performed by Terra Systems of Claymont, Delaware to evaluate the effectiveness of the reagent mix required to oxidize the MTBE and BTEX in groundwater in the central portion of the Site. One groundwater sample and one soil sample were collected from the proposed treatment area and analyzed by Terra Systems under various dosages of four primary reagents: alkaline activated persulfate, calcium peroxide activated persulfate, carbohydrate activated sodium persulfate activated persulfate, and modified Fenton's reagent (MFR). The results of the study indicated that MFR reduced the MTBE concentration in groundwater by 99% and in soil by 96% in the high dosage analysis, and was shown to be more effective than the other three reagents. Therefore, MFR was selected.

### 2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site, as listed in the DD dated November 18, 2019, are as follows:

RAOs for Public Health Protection

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

**RAOs** for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

<u>Soil</u>

**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.

### <u>Soil Vapor</u>

**RAOs for Public Health Protection** 

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

### 2.5 Remaining Contamination

#### 2.5.1 Soil

Remedial excavation was conducted to one foot below grade across the Site with additional soil excavation to seven feet below grade within the petroleum contaminated source area. Following completion of soil excavation and removal activities, 53 documentation soil samples were collected. Analytical results of the soil documentation sampling indicate that residual soil contamination remains in place below the remedial excavation extents. A site cover system consisting of a combination of concrete building slabs and exterior concrete sidewalks and asphalt pavement was constructed during the remedial action to prevent future exposure to remaining contamination.

The laboratory analytical results for the documentation samples are summarized in Tables 2 through 7, and Figure 4 shows the extent of remaining contamination at the Site based on the documentation sample analytical results.

#### 2.5.2 Groundwater

Groundwater quality was characterized during previous investigations prior to entering the BCP and during the RI and SRI as described in Section 2.3. Groundwater beneath the Site was found to have concentrations above the AWQSGVs, including: the VOCs 1,2-dichloroethane, acetone, benzene, xylenes, methyl ethyl ketone, 1,2dimethylbenzene, methyl ethyl ketone, MTBE, and toluene; and the dissolved metals iron, magnesium, manganese, and sodium. These metals are naturally occurring metals commonly found in groundwater.

A one-time application of MFR to the subsurface of the Site via 45 temporary injection points was completed at the Site between March 2 and 19, 2020. The injection points are presented on Figure 5. Following the MFR application, three permanent post-remedial groundwater monitoring wells (MW-05B, MW-06B, and MW-08B) were installed at the locations of the three RI monitoring wells that were destroyed during construction (MW-05, MW-06, and MW-08, respectively). The wells were developed following installation, and the first round of post-remediation groundwater samples (30 days post-MFR application) were collected and submitted for laboratory analysis of VOCs on April 17, 2020.

Laboratory analytical results for VOCs were detected at concentrations above the AWQSGVs in all of the groundwater samples, including the blind duplicate. The petroleum-related compounds 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, n-propelybenzene, and o-xylene were detected above their AWQSGV of 5  $\mu$ g/L at respective concentrations of 130  $\mu$ g/L, 39  $\mu$ g/L, 7.0  $\mu$ g/L, 5.9  $\mu$ g/L, and 28  $\mu$ g/L in MW-08B 20200417. MTBE was detected at concentrations of 690 µg/L, 600 µg/L, µg/L in samples MW-06B 20200417, MW-05B 20200417, and 730 and duplicate 20200417 (the blind duplicate of MW-06B 20200417), above the AWQSGV of 10 µg/L. Monitoring well construction and development logs for the three posttreatment wells are included as Appendix E.

Groundwater contamination, including the contaminants of concern discussed above, remains in the subsurface at the Site. The highest concentrations of petroleum VOCs are located in the approximately 6,600-square-foot area in the central portion of the Site, where the MFR injections points were located and the Biosparge System was constructed. The Biosparge System will continue to address residual groundwater contamination by enhancing natural attenuation of contaminants of concern.

Groundwater use at the Site is subject to the ICs documented within the Environmental Easement.

Table 8 summarizes the results of the post-remedial groundwater samples that exceeded the standards, criteria, and guidance (SCGs) after completion of the remedial action. Exceedances of the AWQSGVs are identified on Figure 6.

#### 2.5.3 Soil Vapor

VOCs in soil vapor are being addressed by the active SSDS installed within the new building (refer to Section 3.3.2). The SSDS piping layout is shown on Figure 8.

#### 2.6 Management of Remaining Contamination

The remaining contamination at the Site is managed via utilization of ICs and ECs to isolate the remaining contamination, prevent exposure, and be protective of human health and the environment. The ICs are in the form of an Environmental Easement for the Site that requires periodic certification, allows the use and development of the Site for restricted commercial use; restricts the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH; and requires compliance with this NYSDEC-approved SMP.

Section 3 (Institutional and Engineering Control Plan) includes descriptions and plans for the ECs, and the requirements for monitoring, inspection, operation and maintenance, and reporting to confirm that remediation goals continue to be met.

## 3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

#### 3.1 General

Since remaining contamination exists at the Site, ICs/ECs are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all ICs/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by NYSDEC.

This plan provides:

- A description of all ICs/ECs on the Site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ICs/ECs, such as the implementation of the EWP (Appendix F) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the ICs/ECs required by the Site remedy, as determined by the NYSDEC project manager.

Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a HASP and associated Community Air Monitoring Plan (CAMP) prepared for the Site (provided in Appendix G).

## **3.2 Institutional Controls**

A series of ICs are required by NYSDEC's November 2019 DD to: (1) implement, maintain and monitor ECs; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the Site to commercial or industrial uses only. Adherence to these ICs on the Site is required by the Environmental Easement and will be implemented under this SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 2. These ICs are as follows:

- The Site may be used for commercial or industrial use only;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the Site is prohibited without necessary water quality treatment, as determined by NYSDOH or the Queens Department of Health, to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from NYSDEC;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this SMP;

- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the Site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- In-ground vegetable gardens and farming on the Site are prohibited; and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

## **3.3 Engineering Controls**

## 3.3.1 Site Cover System

Exposure to potential soil, groundwater, and soil vapor is prevented by a Cover System built on the Site. The cover system is comprised of a concrete building foundation, and exterior sidewalks and pathways; an asphalt-paved parking lot; and a minimum one-foot clean fill buffer with a demarcation barrier in all landscaped and non-covered areas. Figure 7 presents the location and typical cross-sections of the Cover System.

The EWP (Appendix F) outlines the procedures to be implemented in the event the cover system is breached, penetrated, or temporarily removed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a HASP and associated CAMP prepared for the Site and provided in Appendix G. Any breach of the Site's cover system must be overseen by a Professional Engineer (PE) who is licensed and registered in NYS, or a qualified person who directly reports to a QEP or NYS-licensed PE.

## 3.3.2 Active Sub-Slab Depressurization System

An active SSDS was installed at the new building and became operational on October 13, 2023. The SSDS consists of slotted and solid polyvinyl chloride (PVC) piping beneath the entire Site building footprint, which is connected via a network of aboveground piping to a riser and exhaust stack. The installed SSDS consists of:

- Six horizontal 4-inch-diameter, 0.020-inch slotted and solid PVC pipe runs;
- A minimum 6-inch layer of <sup>3</sup>/<sub>4</sub>-inch gas-permeable aggregate (GPA) stone bedding under, around, and above all active SSDS piping;
- Four vacuum monitoring points (VMPs) (MP-01 through MP-04);
- A fan capable of operating at 10 inches of water (in H<sub>2</sub>O) and 300 cubic feet per minute (CFM) air flow rate; and
- A 6-inch PVC riser pipe extending from the ground floor to an exhaust stack on the  $2^{nd}$  floor roof.

- A variable-frequency drive (VFD) to throttle blower operation, to be installed along with the blower on the roof of the building;
- Installation of a control panel equipped with a telemetry alarm system to notify select personnel (AKRF Project Manager, Deputy Project Manager, and building operations personnel) of alarm conditions; and
- Accessories, including cleanouts, sample ports, vacuum indicators/pressure gauges, flow meters, butterfly valves, and differential pressure switches.

During construction, non-woven geotextile fabric overlain by a minimum 6-inch layer of <sup>3</sup>/<sub>4</sub>-inch GPA stone bedding was installed under, around, and above all SSDS piping, and below the vapor barrier and building slab. The installation of GPA in the treatment areas is expected to promote favorable subsurface conditions for ventilation of vapors. The four VMPs were installed around the perimeter of the Site.

A suction fan or blower is located in a secure enclosure on the rear bulkhead roof. The operational capabilities of the suction fan has a minimum rating of 160 cubic feet per minute (cfm) and will operate at a vacuum of approximately 8 in H<sub>2</sub>O (subject to balancing). The vacuum capabilities of the proposed fan are intended to overcome frictional losses within the subsurface and aboveground piping and induce a minimum vacuum of 0.004 in H<sub>2</sub>O at each of the vacuum monitoring points.

The SSDS layout is shown on Figure 8, and the as-built drawings of the active SSDS are provided in Appendix H.

## 3.3.3 Biosparge System

A Biosparge System was installed beneath the new building foundation and became operational on October 13, 2023. The Biosparge System consists of 23 biosparge wells installed in two rows aligned from east to west, each with a 2-inch-diameter PVC casing and 3 feet of screen, to a total depth of 25 feet. Piping trenches were installed to connect a 1-inch-diameter high-density polyethylene (HDPE) line to each well to the treatment system room. Trenches were dug that were approximately 2 feet deep by 2 feet wide and included the primary HDPE line and a spare 6-inch-diameter corrugated pipe and tracer line. Trenches were then backfilled with crushed stone. The treatment system room includes a skid-mounted air sparge compressor, silencer, and aftercooler, with manifolded lines. The compressor provides up to 2 standard cubic feet per minute (scfm) of air flow to each well, for a total flow rate of approximately 46 scfm. A minimum sparging pressure of approximately 9 pounds per square inch (psi) is applied from the compressor to account for hydrostatic pressure, air entry pressure, and friction losses in the 1-inch HDPE lines.

The Biosparge System is designed to intercept the general direction of groundwater flow. The biosparging rows act as barriers to prevent off-site migration of MTBE and provide sufficient oxygen to degrade MTBE up and downgradient of the source area treatment zone. The Biosparge System layout is shown on Figure 9, and as-built drawings of the Biosparge System are provided in Appendix H.

#### 3.3.4 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the RAOs identified by the DD. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the Site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all Site-related monitoring, injection, and recovery wells, as per the NYSDEC CP-43 policy.

The remedial party will also conduct any needed Site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the remedial party will conduct any necessary restoration of vegetation coverage, trees, and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the Site.

#### Site Cover System

The Site Cover System is a permanent control, and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with this SMP in perpetuity.

The Site Cover System will not be decommissioned unless prior written approval is granted by the NYSDEC and NYSDOH project managers, as it is anticipated to be a permanent EC.

#### Active SSDS

The active SSDS will not be decommissioned unless prior written approval is granted by the NYSDEC and NYSDOH project managers, as it is anticipated to be a permanent EC. If future monitoring and/or sampling data indicates that the SSDS may no longer be required, a proposal to discontinue the SSDS will be submitted by the remedial party to the NYSDEC and NYSDOH project managers.

#### **Biosparge System**

The Biosparge System will not be decommissioned unless prior written approval is granted by the NYSDEC and NYSDOH project managers, as it is anticipated to be a permanent EC. If future monitoring and/or sampling data indicates that the Biosparge System may no longer be required, a proposal to discontinue the Biosparge System will be submitted by the remedial party to the NYSDEC and NYSDOH project managers.

## Post-Remedial Monitoring Wells

Groundwater monitoring activities to assess effectiveness of the Biosparge System to enhance natural attenuation will continue, as determined by NYSDEC with consultation with NYSDOH, until residual groundwater concentrations are found to be consistently below AWQSGVs or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicates that monitoring for natural attenuation may no longer be required, a proposal to discontinue such monitoring will be submitted by the remedial party but will otherwise continue until permission to discontinue is granted in writing by NYSDEC.

If groundwater contaminant levels become asymptotic at a level that is not acceptable to NYSDEC, a revised chemical oxidation injection/treatment plan would be developed for the Site and submitted to NYSDEC for review and approval. The dosage of any reagents

may change based on the results of the post-remedial groundwater samples. If a revision to the treatment plan is warranted, notification will be made to NYSDEC with the proposed changes.

## 4.0 MONITORING AND SAMPLING PLAN

#### 4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the groundwater treatment remedy. This Monitoring and Sampling Plan may only be revised with the approval of NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of Site management for the Site are included in the QAPP provided in Appendix I.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater and soil vapor);
- Assessing compliance with applicable NYSDEC SCGs, particularly NYSDEC TOGS (1.1.1): Class GA AWQSGVs; and
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment.

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells; and
- Monitoring well decommissioning procedures.

Reporting requirements are provided in Section 7.0 of this SMP.

#### 4.2 Site-Wide Inspection

Site-wide inspections will be performed annually. The inspections must be conducted when the ground surface is visible (i.e. no snow cover). Site-wide inspections will be performed by a QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in NYS, or a qualified person who directly reports to a PE who is licensed and registered in NYS. Modification to the frequency or duration of the inspections will require approval from the NYSDEC project manager. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed, as provided in Appendix J – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- The condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection;
- Whether stormwater management systems, such as basins and outfalls, are working as designed;
- The Site management activities being conducted. including, where appropriate, confirmation sampling and a health and safety inspection; and

• Whether Site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive Site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with the requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If Site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs, occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC project manager must be given by noon of the following day. In addition, an inspection of the Site by a QEP, as defined in 6 NYCRR Part 375, will be conducted within 5 days of the event to verify the effectiveness of the ICs/ECs implemented at the Site. Written confirmation must be provided to the NYSDEC project manager within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. The remedial party will submit follow-up status reports to the NYSDEC within 45 days of the event on actions taken to respond to any emergency event requiring ongoing responsive action describing and documenting actions taken to restore the effectiveness of the ECs.

## 4.3 Biosparge System Monitoring and Sampling

Monitoring of the Biosparge System will be performed on a routine basis, as identified in Table III. The monitoring of Biosparge System must be conducted by a QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in NYS, or a qualified person who directly reports to a NYS-licensed PE. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager. A visual inspection of the complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of the Biosparge System has been reported or an emergency occurs that is deemed likely to affect the operation of the system. The Biosparge System components to be monitored include, but are not limited to, the components included in Table III.

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Biosparge Wells	Flow Rate	2 scfm	Monthly for the first quarter, and quarterly thereafter
Air Sparge Compressor	Flow Rate	46 scfm	Monthly for the first quarter, and quarterly thereafter
1-inch HDPE lines	Applied Pressure	9 psi	Monthly for the first quarter, and quarterly thereafter

 Table III

 Remedial System Monitoring Requirements and Schedule

A complete list of components to be inspected is provided in the Inspection Checklist, provided in Appendix J - Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair (as per the Operation and Maintenance Plan) is required immediately.

#### 4.4 Post-Remediation Media Monitoring and Sampling

Post-remediation groundwater samples shall be collected from the monitoring wells on a routine basis. Sampling locations required analytical parameters, and a schedule are provided in Tables IV and V, below. Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

#### 4.4.1 Groundwater Sampling

Groundwater monitoring will be performed on a quarterly basis for one year, with one sample collected from each of the three groundwater monitoring wells (MW-05B, MW-06B, MW-08B). The frequency after the first year will be specified in the first . Modification to the frequency or sampling requirements will require approval from the NYSDEC project manager.

The network of monitoring wells, as shown on Figures 5 and 9, has been installed to monitor remaining groundwater contamination at upgradient, on-site, and downgradient groundwater at the Site. The network of on-site wells on-site. Table IV summarizes each well's purpose, location, depth, diameter, and screened interval. The remedial party will measure depth to the water table for each monitoring well in the network before sampling.

Monitoring Well ID	Well Location	Coordinates (longitude/ latitude) <sup>1</sup>	Well Diameter (inches)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Elevation (above msl) <sup>1</sup>
MW-05B	Downgradient	40.1854347°/ 064.4436503°	2	12	17	31.50
MW-06B	Central	40.1844432°/ 064.4433424°	2	14	24	27.79
MW-08B	Upgradient	40.1835119°/ 064.4431737°	2	14	24	27.73

Table IVMonitoring Well Construction Details

Notes:

<sup>1</sup>All elevations are measured using North American Vertical Datum of 1988 (NAVD88) and locations are measured using the North American Datum of 1983 – Long Island Zone.

ft bgs = feet below ground surface, msl = mean sea level

 $^{\circ} = degrees$ 

Monitoring well construction logs are included in Appendix E of this SMP. Deliverables for the groundwater monitoring program are specified below and in Section 7.0 - Reporting Requirements.

The samples will be submitted to a NYSDOH-certified laboratory for analysis of Part 375 and Target Compound List (TCL) VOCs using Category B deliverables, as

summarized in Table V. One blind duplicate, one field blank, one trip blank, and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected for quality assurance/quality control (QA/QC) purposes. The groundwater data will be reviewed by a third-party validator and a DUSR will be prepared to document the usability and validity of the data. All purged groundwater will be containerized in 55-gallon drums for future off-site disposal at a permitted facility.

Sampling Location	Analytical Parameters	Schedule
MW-05B	TCL and Part 375 VOCs (EPA Method 8260)	Quarterly for first year.
MW-06B	TCL and Part 375 VOCs (EPA Method 8260)	Quarterly for first year.
MW-08B	TCL and Part 375 VOCs (EPA Method 8260)	Quarterly for first year.

Table V			
Post Remediation Groundw	ater Sampling Re	quirements and Sche	dule

The groundwater analytical results will be reported to NYSDEC in a brief letter report, which will include a summary of the ongoing the Biosparge System operation, laboratory analytical results, a comparison to the baseline groundwater analytical results, and recommendations for additional groundwater treatment, if necessary. The first post-remediation groundwater sampling event occurred in April 2020, one month after the ISCO groundwater treatment event. Quarterly sampling events will begin in March 2024, and quarterly thereafter for one year (March, June, September, and December 2024).

Based on the first post-remediation sampling results, additional ISCO treatment events are not needed at this time. Additional groundwater monitoring will be conducted if subsequent ISCO treatment events are requested. Modification to the frequency or sampling requirements will require approval from NYSDEC.

#### 4.4.2 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix J – Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will also be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network.

Prior to collecting the samples, but after removing the well cap, each well will be screened for the presence of VOCs using a PID. The depth to groundwater will then be measured in the wells using an electronic oil/water interface probe attached to a measuring tape accurate to 0.01 foot; this will also be used to gauge potential measurable product on the surface of the water table. The water level data, well diameter, and depth to bottom will be used to calculate the volume of water in each well and any free-phase product will be documented, if present. The wells that do not contain free-phase product will then be purged using low-flow purging techniques.

Groundwater samples will be collected using dedicated polyethylene tubing and placed directly into laboratory-supplied sample bottles. The samples will be analyzed by a NYSDOH ELAP-certified laboratory with NYSDEC Category B deliverables. For wells that contain free-phase product (not anticipated), a sample of the product will be collected and analyzed for flashpoint. All non-dedicated sampling equipment (e.g., submersible pumps and oil/water interface probes) will be decontaminated between sampling locations using the following procedure:

- 1. Scrub equipment with a bristle brush using a tap water/Simple Green® or Alconox® solution.
- 2. Rinse with tap water.
- 3. Scrub again with a bristle brush using a tap water/Simple Green® or Alconox® solution.
- 4. Rinse with tap water.
- 5. Rinse with distilled water.
- 6. Air-dry the equipment.

#### 4.4.3 Monitoring Well Repairs and Decommissioning

If biofouling or silt accumulation occurs in the on-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, if an event renders the wells unusable, the monitoring wells will be properly decommissioned and replaced. Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent PRR. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled CP-43: Groundwater Monitoring Well Decommissioning Procedures. Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by NYSDEC.

The sampling frequency may only be modified with the approval of NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by NYSDEC. Deliverables for the groundwater monitoring program are specified in Section 7.0 - Reporting Requirements.

#### 4.4.4 Soil Vapor Intrusion Evaluation

The potential for soil vapor intrusion was evaluated as part of the remedy and during the preparation of this SMP. The evaluation was based on the following: 1) after completion of soil removal activities, VOCs remaining in soil were documented through end-point sample results; 2) the ISCO program addressed VOCs in groundwater; and the biosparge system will continue to address remaining VOCs in groundwater; and, 3) an active SSDS was installed in the new building. As these measures will address any potential vapor intrusion concerns, a post-remedial soil vapor intrusion investigation is not warranted and no additional mitigation, monitoring, or sampling is required at this time.

A Soil Vapor Intrusion Evaluation (SVIE) will be conducted for any newly constructed buildings on-site. A change in use may also prompt a SVIE at the discretion of the NYSDEC and NYSDOH. A SVIE workplan will be prepared in accordance with the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006), with updates, and submitted to NYSDEC and NYSDOH for review/approval. Preliminary data will be provided to the agencies as soon as possible, but no later than 10 days after

receipt of preliminary data. A SVIE Report will be provided to the agencies after receipt of validated data with a recommendation for actions or no actions depending on the results of the SVIE.

#### 4.4.5 Soil Vapor Intrusion Sampling

Based on the soil vapor intrusion evaluation conducted for the proposed new building, soil vapor intrusion sampling is not needed at this time. In the event that the active SSDS is proposed to be converted into a passive system, sub-slab soil vapor, indoor air, and ambient air sampling will be conducted in accordance with NYSDOH Soil Vapor Intrusion Guidance. A vapor intrusion work plan outlining the proposed sampling plan will be submitted to NYSDEC/NYSDOH for their review and approval prior to conducting any sampling.

## 5.0 OPERATION AND MAINTENANCE PLAN

#### 5.1 Introduction

This Operation and Maintenance (O&M) Plan provides a brief description of the measures necessary to operate, monitor, and maintain the mechanical components of the remedy selected for the Site, which include the active SSDS and Biosparge System. This O&M Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the active SSDS and Biosparge System; and
- Will be updated periodically to reflect changes in Site conditions or the manner in which the active SSDS and Biosparge System are operated and maintained.

The following sections provide a description of the O&M of the active SSDS and Biosparge System. Cut-sheets, as-built drawings, and maintenance and operating manuals for each system are included in Appendices K and L, respectively. A copy of this O&M Plan, along with the complete SMP, is to be maintained at the Site at all times. This O&M Plan is not to be used as a standalone document, but as a component of this SMP.

## 5.2 Active SSDS

Intrusion of contaminated soil vapor (if any) from the subsurface to the Site building's interior is being prevented by an active SSDS, which applies negative pressure (vacuum) beneath the slabon-grade portion of the Site building to collect and discharge the vapor to the atmosphere above the  $2^{nd}$  floor building roof. The Site-specific design for the active SSDS was developed based on elevated concentrations of VOCs detected during previous soil vapor sampling events completed as part of the RI and SRI, and was designed to maintain a minimum 0.004 in H<sub>2</sub>O.

The major components of the SSDS include:

- Six horizontal 4-inch-diameter, 0.020-inch slotted and solid PVC pipe runs;
- A minimum 6-inch layer of <sup>3</sup>/<sub>4</sub>-inch gas-permeable aggregate (GPA) stone bedding under, around, and above all active SSDS piping;
- Four vacuum monitoring points (VMPs) (MP-01 through MP-04);
- A fan capable of operating at 10 inches of water (in H<sub>2</sub>O) and 300 cubic feet per minute (CFM) air flow rate; and
- A 6-inch PVC riser pipe extending from the ground floor to an exhaust stack on the 2<sup>nd</sup> floor roof.
- A variable-frequency drive (VFD) to throttle blower operation, to be installed along with the blower on the roof of the building;
- Installation of a control panel equipped with a telemetry alarm system to notify select personnel (AKRF Project Manager, Deputy Project Manager, and building operations personnel) of alarm conditions; and
- Accessories, including cleanouts, sample ports, vacuum indicators/pressure gauges, flow meters, butterfly valves, and differential pressure switches.

The active SSDS is designed to operate continuously, 24 hours a day, 7 days a week, 365 days a year, without any required adjustments or repairs beyond the routine maintenance items discussed

in this SMP. Manufacturer's specifications for each of the active SSDS components are included in Appendix K.

## 5.2.1 Active SSDS Start-Up and Testing

The SSDS became operation on October 13, 2023; SSDS inspection logs from that day are included in Appendix J. Startup comprised vacuum, temperature, and pressure gauge readings for the active SSDS influent lines, blower accessory readings including variable frequency drive (VFD) settings, pre- and post-blower particulate filters vacuum and air flow rate readings, sample port VOC screening, vacuum balancing, and system alarm checks.

Specifically, the following inspections and testing were performed to ensure the system is balanced:

- Confirmation of acceptable air flow rate from each of the active SSDS pipe runs by a visual inspection of gauges affixed to each of the manifold legs;
- Confirmation of acceptable vacuum readings from each of the active SSDS runs by a visual inspection of gauges affixed to each of the manifold legs and use of an appropriate manometer or portable vacuum gauging device; and
- Confirmation of acceptable induced vacuum beneath the entire ground floor slab from VMPs MP-1 through MP-4 through the manual access of each point and use of an appropriate manometer or portable vacuum gauging device.

## 5.2.2 Active SSDS Routine System Inspection

The routine active SSDS inspection check will consist of a visual inspection noting the individual flow rate and vacuum readings for each of the active SSDS riser legs. The routine check will also note any alarms or unusual conditions (e.g., unusual odors, leaks, blower noise etc.). Typical routine maintenance items that should be addressed during these inspections include:

- Confirmation that the blower is operating and air is discharging through the exhaust piping to the roof;
- Confirmation that the gauges on each manifold leg are clean and within normal ranges; and
- Confirmation that the exterior of the active SSDS control panel is clean.

In the event than an unusual condition is identified, a key contact listed in Appendix B of this SMP will be notified. Any maintenance completed for the active SSDS should be documented in the Site Management Forms included as part of Appendix J.

## 5.2.3 Active SSDS Operation and Maintenance

Operation of the active SSDS will be monitored in accordance with the frequency and detail set forth in Table VI. Monitoring of the active SSDS will consist of a visual inspection of the complete system, including checking to confirm that the active SSDS blower is operating properly, observing all associated air flow and vacuum gauges and alarms to confirm system diagnostics, and identification and repair of any system malfunctions or problems (i.e., leaks, cracks, collection of condensation, etc.).
Monitoring Inspection on			
Sampling Type	Frequency	Maintenance Task	
SSDS Routine Operations Inspection	Quarterly	System Inspections	
SSDS Detailed Operations Inspection	Annually	System Components	

 Table VI

 Active SSDS Routine and Detailed Inspection Schedule

The active SSDS will operate continuously at the Site and will not be discontinued without written approval by NYSDEC and NYSDOH.

### System Component Maintenance

The detailed operations check will be performed to identify/rectify operations-based maintenance items, such as malfunctioning active SSDS risers, piping runs, and/or other system components. Typical detailed maintenance items that should be addressed during these inspections include:

- Confirm/assess blower performance and integrity;
- Assess blower and determine need for replacement;
- Confirm/assess the operating condition of VMPs MP-01 though MP-04; and
- Confirm/assess the structural integrity of concrete floor slabs overlying constructed active SSDS manifold and piping runs.

In the event that a condition warranting system component maintenance or repair is identified, the appropriate reporting and maintenance should be conducted immediately. Manufacturer's recommendations for system component maintenance and maintenance logs are included in Appendix K.

### 5.2.4 Active SSDS Non-Routine Checks and Equipment Maintenance

In most instances, non-routine maintenance will be required due to operating conditions that are governed by the active SSDS alarms and system telemetry, which will operate on a dedicated internet connection connected to the building management system (BMS). The primary objective of system telemetry is to notify personnel when operating conditions are likely to reduce or otherwise compromise efficiency, which could lead to the uncontrolled intrusion of contaminated soil vapor into the Site building.

In the event that low active SSDS air flow rates or vacuum are observed anywhere in the system, further system balancing may be necessary following moisture removal to ensure that the combined air flow rates and vacuum in a given area of the Site achieve the minimum design requirements. Throttling valves for individual active SSDS lines are located on the manifold legs detailed in the as-built drawings (Appendix H).

### Monitoring Devices and Alarms

The SSDS has a warning alarm to indicate that the system is not operating properly (e.g., vacuum blower failure or a low vacuum condition at the blower). In the event that a warning alarm is activated, applicable maintenance and repairs will be conducted, as

specified in this O&M Plan, and the SSDS will be restarted. Operational problems will be noted in the PRR prepared for that reporting period.

### 5.3 Biosparge System

To enhance the degradation of MTBE and BTEX compounds, and to prevent contaminated groundwater from migrating off-site, a network of biosparging wells was installed during Site redevelopment within the building footprint and in the exterior parking area to continuously inject low flow rates of atmospheric air into the shallow aquifer. Nutrients and the microbial culture will be injected using the piping and well network to stimulate and augment the natural microbial population in the subsurface.

The major components of the Biosparge System include:

- Twenty-three 2-inch-diameter PVC biosparge wells (SW-01 through SW-23), each constructed with 0.020-inch slotted well screen from approximately 23 feet below grade to approximately 25 feet below the bottom of the concrete slab-on-grade;
- Dedicated airlines consisting of 1-inch-diameter HDPE tubing connecting each individual biosparge well to a remediation room on the eastern portion of the Site; and
- An enclosed, skid-mounted air compressor, silencer, and aftercooler with manifolded piping.

The Biosparge System is designed to operate continuously, 24 hours a day, 7 days a week, 365 days a year, without any required adjustments or repairs beyond the routine maintenance items discussed herein. Manufacturer's specifications for each of the Biosparge System components are included in Appendix L.

### 5.3.1 Biosparge System Start-Up and Testing

Startup of the Biosparge System occurred on October 13, 2023; biosparge system inspection logs from that day are included in Appendix J. Startup included obtaining pressure gauge readings for each of the 23 biosparge wells and dedicated lines, air flow rate and line pressure of the skid-mounted compressor and piping manifold, and system alarm checks.

Specifically, the following inspections and testing were performed to ensure the system was balanced:

- Confirmation of an acceptable air flow rate from each of the 23 biosparge wells and dedicated lines by a visual inspection of gauges affixed to each of the manifold legs;
- Confirmation of an acceptable flow rate at each of the biosparge wells (SW-01 through SW-23) through the manual access of each point and use of an appropriate manometer or portable vacuum gauging device; and
- Confirmation of acceptable air flow and pressure readings from a skid-mounted compressor and wall-mounted piping manifold.

### 5.3.2 Biosparge System Routine System Inspection

The routine Biosparge System inspection check will consist of a visual inspection noting the individual flow rate for each of the Biosparge System air lines. The routine check will also note any alarms or unusual conditions (e.g., unusual odors, leaks, compressor noise etc.). Typical routine maintenance items that should be addressed during these inspections include:

- Confirmation that the compressor is operating and air is discharging through each air line to the network of biosparge wells;
- Confirmation that the gauge on each air line is clean and within normal range; and
- Confirmation that the exterior of the Biosparge System control panel is clean.

In the event than an unusual condition is identified, a key contact listed in Appendix B of this SMP will be notified. Any maintenance completed for the Biosparge System will be documented in the Maintenance Log included as part of Appendix J.

### 5.3.3 Biosparge System Routine Operation and Maintenance

Operation of the Biosparge System will be monitored in accordance with the frequency and detail set forth in Table VII, below. Monitoring of the system will consist of a visual inspection of the complete system, including checking to confirm that the skid-mounted compressor and piping manifold is operating properly, observing all associated air flow gauges and alarms to confirm system diagnostics, and identification and repair of any system malfunctions or problems (i.e., leaks, cracks, collection of condensation, etc.).

Table VII	
Biosparge System Routine and Detailed Inspection Schedule	)

Monitoring Inspection or Sampling Type	Frequency	Maintenance Task
Biosparge System Routine Operations Inspection	Monthly	System Inspections
Biosparge System Detailed Operations Inspection	Quarterly	System Components

The Biosparge System will operate continuously at the Site and will not be discontinued without written approval by NYSDEC and NYSDOH.

### System Component Maintenance

The detailed operations check will be performed to identify/rectify operations-based maintenance items, such as malfunctioning compressor, airline piping runs, and/or other system components. Typical detailed maintenance items that should be addressed during these inspections include:

- Confirm/assess compressor performance and integrity;
- Assess compressor and determine need for replacement;
- Assess airlines and determine need for replacement;
- Confirm/assess the operating condition of biosparge wells SW-01 through SW-23; and
- Confirm/assess the structural integrity of concrete floor slabs overlying constructed biosparge manifold and airline piping runs.

In the event that a condition warranting system component maintenance or repair is identified, the appropriate reporting and maintenance will be conducted immediately. Manufacturer's recommendations for system component maintenance and maintenance logs are included in Appendix L.

### 5.3.4 Biosparge System Non-Routine Checks and Equipment Maintenance

In most instances, non-routine maintenance will be required due to operating conditions that are governed by the Biosparge System alarms and system telemetry, which will operate on a dedicated internet connection connected to the BMS. The primary objective of system telemetry is to notify personnel when operating conditions are likely to reduce or otherwise compromise efficiency.

In the event that low airline flow rates are observed anywhere in the system, further system balancing may be necessary following moisture removal to ensure that the air flow rates in a given area of the Site achieve the minimum design requirements. Throttling valves for individual biosparge lines are located on the manifold legs.

### 5.3.5 Monitoring Devices and Alarms

The Biosparge System has a warning alarm to indicate that the system is not operating properly (e.g., high temperature or blower failure). In the event that a warning alarm is activated, applicable maintenance and repairs will be conducted, as specified in this O&M Plan, and the Biosparge System will be restarted. Operational problems will be noted in the PRR to be prepared for that reporting period.

### 5.4 Fire Safety

The remedial party will conduct an annual facility walk with the local fire chief and/or fire suppression team. The site walk will allow for the addition of the facility to any local preplanning efforts. The NYSDEC project manager will be provided with the local fire chief's/fire suppression team's recommendations as soon as they become available. Following review, the NYSDEC project manager may direct the remedial party to implement the recommendations and/or revise the SMP.

### 6.0 PERIODIC ASSESSMENTS/EVALUATIONS

### 6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns, and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness, and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that a site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or ECs to severe storms/weather events and associated flooding.

- Flood Plain: The Site is not located within a flood plain.
- Site Drainage and Storm Water Management: Stormwater at the Site and the surrounding area flows to the NYC combined sewer system.
- **Erosion:** As a majority of the Site is covered with a building, erosion is not anticipated to be an issue of concern.
- **High Wind:** All permanent building components are secured against high winds. In the event that high winds are forecast for the Site, proper precautions will be taken to secure or shelter any Site components that are not protected against high winds.
- **Electricity:** Electricity to the buildings is supplied via newly installed underground vaults and conduits and is not expected to be affected by severe weather events.
- **Spill/Contaminant Release:** Storage of large amounts of fuel oil or other chemicals is not expected at the Site. Nominal amounts of cleaning chemicals are likely to be stored throughout the Site but are not expected to be affected by severe weather conditions.

### 6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires consideration of green remediation concepts and techniques during all stages of the remedial program, including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This SMP does not require any green remediation evaluations to be completed for the Site during site management. Any updates or related site improvements will be incorporated in the PRR.

### 6.3 Remedial System Optimization

A Remedial System Optimization (RSO) study will be conducted any time that NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the DD;
- The management and operation of the remedy is exceeding the estimated costs;
- The remedy is not performing as expected or as designed;

- Previously unidentified source material may be suspected;
- A plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of site management to another remedial party or agency; or
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information, and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on overall site cleanup strategy, process optimization, and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness, and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

### 7.0 **REPORTING REQUIREMENTS**

### 7.1 Site Management Reports

All site management inspection events will be recorded on the appropriate site management forms provided in Appendix J. These forms are subject to NYSDEC revision. All site management inspection, maintenance, and monitoring events will be conducted be performed by a QEP as defined in 6 NYCRR Part 375, a PE who is licensed and registered in NYS, or a qualified person who directly reports to a PE who is licensed and registered in NYS.

All applicable inspection forms and other records generated for the Site during the reporting period will be provided in electronic format to NYSDEC as part of the PRR, in accordance with the requirements summarized in Table VIII.

 Table VIII

 Monitoring/Inspection Report Deliverables

Task/Report	Reporting Frequency*					
PRR	First PRR 18 months after receipt of COC. Subsequent PRRs					
(Inclusive of all monitoring	every year until termination of the Environmental Easement,					
and sampling events)	or as otherwise determined by NYSDEC.					
Note:						
* The frequency of events will be conducted as specified until otherwise approved by NYSDEC.						

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- If applicable, the type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc.);
- Copies of all field forms completed (e.g., CoC documentation, etc.);
- If applicable, sampling results in comparison to appropriate standards/criteria;
- If applicable, a figure illustrating sample type and sampling locations;
- If applicable, copies of all laboratory data sheets and the laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether conditions have changed since the last reporting event.

If data is collected, it will be reported in digital format as determined by NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS<sup>TM</sup> database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

### 7.2 Periodic Review Report

A PRR will be submitted to the NYSDEC project manager beginning 18 months after the COC is issued. After submittal of the initial PRR, the next PRR shall be submitted every year to the NYSDEC project manager or at another frequency as may be required by the NYSDEC project manager. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in the Environmental Easement (see Appendix A). The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will be incorporated into the PRR. The report will include:

- Identification, assessment, and certification of all ECs/ICs required by the remedy for the Site;
- Results of the required annual Site inspections and severe condition inspections, if applicable;
- A description of any change of use, import of materials, or excavation that occurred during the certifying period;
- All applicable site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted;
- Identification of any wastes generated during the reporting period, along with waste characterization data, manifests, and disposal documentation;
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions (if applicable);
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), including a listing of all compounds analyzed, along with the applicable standards and all exceedances highlighted. These tables and figures will include a presentation of past data as part of an evaluation of contaminant concentration trends, including but not limited to:
  - Trend monitoring graphs that present groundwater contaminant levels from before the start of the remedy implementation to the most current sampling data;
  - Trend monitoring graphs depicting system influent analytical data on a per event and cumulative basis;
  - O&M data summary tables;
  - A current plume map for sites with remaining groundwater contamination; and
  - A groundwater elevation contour map for each gauging event.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period, submitted in digital format as determined by NYSDEC;
- A Site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the Site-specific DD;
  - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan;

- An evaluation of trends in contaminant levels in the affected media to determine if the remedy continues to be effective in achieving remedial goals as specified by the DD; and
- The overall performance and effectiveness of the remedy.
- A performance summary for the biosparge system at the Site during the calendar year, including information such as:
  - The number of days the system operated for the reporting period;
  - The average, high, and low flows per day;
  - The contaminant mass removed and the cost per pound of mass removed during the certification period and during the life of the treatment system;
  - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
  - A description of the resolution of performance problems;
  - Alarm conditions;
  - Trends in equipment failure;
  - A summary of the performance, effluent, and/or effectiveness monitoring; and
  - Comments, conclusions, and recommendations based on data evaluation. Recommendations must address how receptors would be impacted. Recommendations can include:
    - Proposals to address efficiency and costs, such as instituting remote operation, system changes to decrease maintenance costs and downtime, and system changes to decrease energy use; and
    - Proposals to modify or shut down a treatment system due to remediation completion, system performance, or changed conditions. System shutdowns are addressed in Section 6.4 of DER-10.

If explicitly requested or required by NYSDEC, a summary of the Green Remediation evaluation will be included in the PRR.

### 7.2.1 Certification of Institutional and Engineering Controls

Certification of ICs/ECs will be included in the PRR.

Following the last inspection of the reporting period, a QEP as defined in 6 NYCRR Part 375 or PE licensed to practice in NYS will prepare, and include in the PRR, the following certification, as per the requirements of NYSDEC DER-10:

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

- The inspection of the Site to confirm the effectiveness of the ICs/ECs required by the remedial program was performed under my direction;
- The ICs/ECs employed at this Site are unchanged from the date the control was put in place, or last approved by NYSDEC;
- Nothing has occurred that would impair the ability of the control to protect public health and the environment;

- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the Site will continue to be provided to NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of these controls;
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the Site is compliant with the Environmental Easement;
- *The ECs are performing as designed and are effective;*
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] for the Site."

The signed certification will be included in the PRR.

The PRR will be submitted, in electronic format, to the NYSDEC Central Office, the NYSDEC Regional Office in which the Site is located, and the NYSDOH Bureau of Environmental Exposure Investigation. The PRR may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

### 7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an IC/EC, a Corrective Measures Work Plan will be submitted to NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by NYSDEC.

### 7.4 Remedial System Optimization Report

If an RSO is to be performed (see Section 6.3), upon completion of an RSO, an RSO report must be submitted to the NYSDEC project manager for approval. The RSO report will document the research/investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model, and present recommendations. RSO recommendations are to be implemented upon approval from NYSDEC. Additional work plans, design documents, HASPs, etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC project manager and the NYSDOH project manager.

### **8.0 REFERENCES**

- 1. 6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
- 2. NYSDEC DER-10 "Technical Guidance for Site Investigation and Remediation".
- 3. NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).
- 4. Phase II Environmental Site Investigation, 151 Flushing Avenue, Soil Mechanics, December 2008.
- 5. Phase I ESA, 151 Woodward Avenue, Environmental Studies Corporation, May 2018.
- 6. Phase II Environmental Site Investigation (ESI), 151 Woodward Avenue, ESC, June 2018.
- 7. Supplemental Phase II Environmental Site Investigation, AKRF September 2018.
- 8. Brownfield Cleanup Program (BCP) Application, Queens Animal Shelter and Care Center, Queens, New York, AKRF, Inc., March 2019.
- 9. Citizen Participation Plan (CPP), Queens Animal Shelter and Care Center, Queens, New York, AKRF Inc., May 2019.
- 10. Brownfield Cleanup Agreement (BCA) 151 Woodward Avenue, Queens Animal Shelter and Care Center, Queens, New York, May 2019.
- 11. Remedial Investigation Work Plan (RIWP), Queens Animal Shelter and Care Center, Queens, New York, AKRF, Inc., May 2019.
- 12. Remedial Investigation Report (RIR), Queens Animal Shelter and Care Center, Queens, New York, AKRF, Inc., October 2019.
- 13. Supplemental Remedial Investigation Report (SRIR), Queens Animal Shelter and Care Center, Queens, New York, AKRF, Inc., November 2019.
- 14. Remedial Action Work Plan (RAWP), Queens Animal Shelter and Care Center, Queens, NY, AKRF Inc., October 2019.
- 15. Decision Document 151 Woodward Avenue, Queens Animal Shelter and Care Center, NYSDEC, Queens, Queens County, November 2019.
- 16. Groundwater Treatment Design Report, Queens Animal Shelter and Care Center, Queens, NY, AKRF Inc., January 2020.
- 17. BCA Amendment 151 Woodward Avenue, Queens Animal Shelter and Care Center, Queens, New York, January 2020.

FIGURES



iszalus















	NYSDEC AWQSGVs µg/l
atile Organic Compounds	
2,4-Trimethylbenzene	5
3,5-Trimethylbenzene (Mesitylene)	5
cetone	50
hylbenzene	5
Propylbenzene	5
-Xylene (1,2-Dimethylbenzene)	5
ert-Butyl Methyl Ether (MTBE)	10
/lenes, M,P	5
als	
admium	5
on	300
ad	25
agnesium	35,000
anganese	300
ckel	100
odium	20,000









A	440 Park Avenue South, New York, NY 10016
CCP PROJECT SITE BOUNDARY OT BOUNDARY AND TAX LOT NUMBER ATBE CONCENTRATION ISOCONTOURS PERMANENT GROUNDWATER MONITORING WELL OCATION GROUNDWATER FLOW DIRECTION DISCHARGE TREATMENT WELL WITH 10' RADIUS OF NELUENCE VASTE CLASSIFICATION GRID art Butyl Ether (MTBE) contours are shown in µg/L.	Queens Animal Shelter and Care Center 151 Woodward Avenue Queens, New York AS-BUILT BIOSPARGE TREATMENT SYSTEM WELLS
	DATE 6/14/2019
0 15 30 60	PROJECT NO. <b>180291</b>
SCALE IN FEET	FIGURE
	9

TABLES

### Table 1Groundwater Elevation SummaryQueens Animal Shelter and Care Center151 Woodward Avenue, Queens, New York

Monitoring Well	Top of Cap Elevation (ft.) <sup>1</sup>	Top of Casing Elevation (ft.)	Depth to Water (ft. bgs) <sup>2</sup>	Depth to Bottom (ft. bgs) <sup>2</sup>	Groundwater Elevation (ft.)
MW-05B	31.50	31.41	15.90	21.05	15.51
MW-06B	27.79	27.25	10.80	15.90	16.45
MW-08B	27.73	27.45	9.20	15.20	18.25

### Notes:

<sup>1</sup>Elevation measured in feet (ft.) above mean sea level according to the North American Vertical Datum of 1988 (NAVD88) on September 5, 2023.

<sup>2</sup>Depth to water measured in feet below ground surface (ft. bgs) at each sample location.

AKRF Sample ID		EP-01_1_20200618 460-211428-1	EP-02_1_20200618 460-211428-4	EP-03_1_20200618 460-211428-9	EP-04_1_20200616 460-211215-1	
Date Sampled			6/18/2020	6/18/2020	6/18/2020	6/16/2020
		Dilution Factor	1	1	1	1
		Unit	ma/ka	mg/kg	ma/ka	ma/ka
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q		CONC Q
1 1 1-Trichloroethane	500	0.68	0.001 U	0.0012 U	0.001 U	0.0011 U
1.1.2.2-Tetrachloroethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
1.1.2-Trichloro-1.2.2-Trifluoroethane (Freon TF)	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
1,1,2-Trichloroethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 UJ
1,1-Dichloroethane	240	0.27	0.001 U	0.0012 U	0.001 U	0.0011 U
1,1-Dichloroethene	500	0.33	0.001 U	0.0012 U	0.001 U	0.0011 U
1,2,3-Trichlorobenzene	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 UJ
1,2,4-Trichlorobenzene	NS	NS	0.001 U	0.0012 U	0.001 U	0.00099 J
1,2-Dibromo-3-Chloropropane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
1,2-Dichlorobenzene	500	1.1	0.001 U	0.0012 U	0.001 U	0.00053 J
1,2-Dichloroethane	30	0.02	0.001 U	0.0012 U	0.001 U	0.0011 U
1,2-Dichloropropane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
1,3-Dichlorobenzene	280	2.4	0.001 U	0.0012 U	0.001 U	0.0011 U
1,4-Dichlorobenzene	130	1.8	0.001 UT	0.0012 UT	0.001 UT	0.0011 U
2-Hexanone	NS	NS	0.005 U	0.0059 U	0.005 U	0.0055 U
Acetone	500	0.05	0.006 U	0.007 U	0.006 U	0.02
Benzene	44	0.06	0.001 U	0.0012 U	0.001 U	0.003
Bromochloromethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Bromodichloromethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Bromoform	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 UJ
Bromomethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Carbon Disulfide	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Carbon Tetrachloride	22	0.76	0.001 U	0.0012 U	0.001 U	0.0011 U
Chlorobenzene	500	1.1	0.001 U	0.0012 U	0.001 U	0.0011 U
Chloroethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Chloroform	350	0.37	0.001 U	0.0012 U	0.001 U	0.0011 U
Chloromethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Cis-1,2-Dichloroethylene	500	0.25	0.001 U	0.0012 U	0.001 U	0.0011 U
	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
	NS	NS	0.001 UJ	0.0012 UJ	0.001 UJ	0.0011 U
Ethylbenzene	390	1	0.001 U	0.0012 U	0.001 U	0.012 J
Isopropyibenzene (Cumene)	NS NC	NS NC	0.001 U			0.069 J
Mathyl Apatata	NS NC	NS NC	0.001 0	0.0012 0	0.001 0	0.14 J
Methyl Acelale	NS 500	0.12	0.005 U	0.0059 U		
Methyl Leobutyl Ketone (2-Dulanone)	000	0.12			0.005 U	0.0055 0
Methyl Isobulyi Relone (4-methyl-2-Pentanone)	NS	NS NS	0.003 0		0.005 0	0.0005 0
Methylene Chloride	500	0.05	0.001 U	0.0012 U	0.001 U	0.009
$\Omega$ Xylene (1.2 Dimethylbenzene)		0.05 NS	0.001 U	0.0012 U		
Styrene	NS	NS	0.001 U	0.0012 U	0.001 U	0.032 3
Tert-Butyl Methyl Ether	500	0.03	0.001 U	0.0012 0		0.016
Tetrachloroethylene (PCF)	150	1 3	0.001 U	0.0012 U	0.001 U	0.011 U
	500	0.7	0.001 U	0.0012 U	0.001 U	0.0053
Trans-1 2-Dichloroethene	500	0.7	0.001 U	0.0012 U	0.001 U	0.0011 U
Trans-1,2-Dichloropropene	NS	NS	0.001 U	0.0012 0	0.001 U	0.0011 U
Trichloroethylene (TCE)	200	0.47	0.001 U	0.0012 U	0.0019.1	0.0011 U
Trichlorofluoromethane	NS	NS	0.001 U	0.0012 U	0.001 U	0.0011 U
Vinyl Chloride	13	0.02	0 001 U	0.0012 U	0.001 U	0.0011 U
		0.02	0.001 0	0.0012 0	0.001 0	0.0011 0

	AKRF Sample ID Laboratory Sample ID		EP-05_1_20200618 460-211428-2	EP-06_1_20200618 460-211428-5	EP-07_1_20200618 460-211428-7	EP-08_1_20200618 460-211428-3
		Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020
		Dilution Factor	1	1	1	1
Common and			mg/kg	mg/kg	mg/kg	mg/kg
	NYSDEC CSCO	NYSDEC PGWSCO				
1,1,1-I richloroethane	500	0.68	0.00099 U	0.0011 U		
1, 1, 2, 2- Tetrachioroethane	INS NC	NS NC	0.00099 0			
1,1,2-Trichlorosthene		INO NC				
1, 1, 2-1 Inchioroethane	240	0.07				
	240 500	0.27			0.0013 U	
1, 1-Dichlorobenzone	500 NS	0.33		0.0011 U	0.0013 U	0.001 U
1,2,3-Trichlorobenzene	NS	NS		0.0011 U	0.0013 U	
1,2,4-Thomotoberizene	NS	NS	0.00099.0	0.0011 U	0.0013 U	0.001 U
1.2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.00099.11	0.0011 U	0.0013 U	0.001 U
1 2-Dichlorobenzene	500	11	0.00099 U	0.0011 U	0.0013 U	0.001 U
1 2-Dichloroethane	30	0.02	0.00099 U	0.0011 U	0.0013 U	0.001 U
1 2-Dichloropropane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
1 3-Dichlorobenzene	280	24	0.00099 U	0.0011 U	0.0013 U	0.001 U
1.4-Dichlorobenzene	130	1.8	0.00099 UT	0.0011 UT	0.0013 UT	0.001 UT
2-Hexanone	NS	NS	0.005 U	0.0056 U	0.0063 U	0.0052 U
Acetone	500	0.05	0.006 U	0.0067 U	0.0076 U	0.0063 U
Benzene	44	0.06	0.00099 U	0.0011 U	0.0013 U	0.001 U
Bromochloromethane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Bromodichloromethane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Bromoform	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Bromomethane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Carbon Disulfide	NS	NS	0.00099 U	0.0011 U	0.00065 J	0.001 U
Carbon Tetrachloride	22	0.76	0.00099 U	0.0011 U	0.0013 U	0.001 U
Chlorobenzene	500	1.1	0.00099 U	0.0011 U	0.0013 U	0.001 U
Chloroethane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Chloroform	350	0.37	0.00099 U	0.0011 U	0.0013 U	0.001 U
Chloromethane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Cis-1,2-Dichloroethylene	500	0.25	0.00099 U	0.0011 U	0.0013 U	0.001 U
Cis-1,3-Dichloropropene	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Cyclohexane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Dibromochloromethane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Dichlorodifluoromethane	NS	NS	0.00099 UJ	0.0011 UJ	0.0013 UJ	0.001 UJ
Ethylbenzene	390	1	0.00099 U	0.0011 U	0.0013 U	0.001 U
Isopropylbenzene (Cumene)	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
M,P-Xylenes	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Methyl Acetate	NS	NS	0.005 U	0.0056 U	0.0063 U	0.0052 U
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.005 U	0.0056 U	0.0063 U	0.0052 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.005 U	0.0056 U	0.0063 U	0.0052 U
Methylcyclohexane	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Methylene Chloride	500	0.05	0.00099 U	0.0011 U	0.0013 U	0.001 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Styrene	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
Tert-Butyl Methyl Ether	500	0.93	0.00099 U	0.0011 U	0.0013 U	0.001 U
Tetrachloroethylene (PCE)	150	1.3	0.00099 U	0.0011 U	0.0013 U	0.001 U
	500	0.7	0.00099 U	0.0011 U	0.0013 U	0.001 U
I rans-1,2-Dichloroethene	500	0.19	0.00099 U	0.0011 U	0.0013 U	0.001 U
I rans-1,3-Dichloropropene	NS	NS	0.00099 U	0.0011 U	0.0013 U	0.001 U
	200	0.47	0.00099 U	0.0011 U	0.0013 U	0.001 U
	NS 40	NS 0.00	0.00099 U	U.UU11 U		0.001 0
vinyi Chioriae	13	0.02	0.00099 0	0.0011 U	0.0013 0	U.UU1 U

	AKRF Sample ID Laboratory Sample ID Date Sampled		EP-09_1_20200618 460-211428-6 6/18/2020	EP-10_1_20200618 460-211428-8 6/18/2020	EP-11_1_20200618 460-211428-10 6/18/2020	EP-12_1_20200612 460-210991-4 6/12/2020
		Dilution Factor	1 ma/ka	1 ma/ka	1 ma/ka	1 ma/ka
Compound	NYSDEC CSCO	NYSDEC PGWSCO				CONC Q
1 1 1-Trichloroethane	500	0.68				
1 1 2 2-Tetrachloroethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1 1 2-Trichloro-1 2 2-Trifluoroethane (Freon TE)	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1 1 2-Trichloroethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1.1-Dichloroethane	240	0.27	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,1-Dichloroethene	500	0.33	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2,3-Trichlorobenzene	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2,4-Trichlorobenzene	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2-Dichlorobenzene	500	1.1	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2-Dichloroethane	30	0.02	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,2-Dichloropropane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,3-Dichlorobenzene	280	2.4	0.0012 U	0.0012 U	0.0012 U	0.001 U
1,4-Dichlorobenzene	130	1.8	0.0012 UT	0.0012 UT	0.0012 UT	0.001 U
2-Hexanone	NS	NS	0.006 U	0.0059 U	0.006 U	0.0052 U
Acetone	500	0.05	0.0072 U	0.021	0.0072 U	0.0062 U
Benzene	44	0.06	0.0012 U	0.0012 U	0.0012 U	0.001 U
Bromochloromethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Bromodichloromethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Bromoform	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Bromomethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Carbon Disulfide	NS	NS	0.0012 U	0.00041 J	0.0012 U	0.0006 J
Carbon Tetrachloride	22	0.76	0.0012 U	0.0012 U	0.0012 U	0.001 U
Chlorobenzene	500	1.1	0.0012 U	0.0012 U	0.0012 U	0.001 U
Chloroethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Chloroform	350	0.37	0.0012 U	0.0012 U	0.0012 U	0.001 U
Chloromethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Cis-1,2-Dichloroethylene	500	0.25	0.0012 U	0.0012 U	0.0012 U	0.001 U
	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Cyclonexane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Dibromochioromethane	NS	NS	0.0012 U			0.001 U
	NS 200	NS	0.0012 UJ	0.0012 UJ	0.0012 UJ	0.001 0
	390 NG		0.0012 U			0.0003 J
Isopropyidenzene (Cumene)	NS NS	NS NS	0.0012 0			0.001 0
Mothyl Apototo	INS NS	INS NS				0.0009 J
Methyl Ethyl Kotono (2 Butanono)	N3 500	0.12				0.0052 0
Methyl Isobutyl Ketone (2-Butanone)	500 NS	0.12 NS	0.006 U	0.0059 0	0.006 U	0.0052 0
Methyl isobutyl Ketone (4-methyl-2-r entarione)	NS	NS	0.0012	0.0039 0	0.000 0	0.0032 0
Methylene Chloride	500	0.05	0.0012 0	0.0012 0	0.0002 0	0.0013
O-Xylene (1 2-Dimethylbenzene)	NS	NS	0.0012 0	0.0012 0	0.0012 []	0.001 []]
Styrene	NS	NS	0.0012 U	0.0012 0	0.0012 0	0.001 U
Tert-Butyl Methyl Ether	500	0.93	0.0012 U	0.0012 U	0.0012 U	0.00071
	150	13	0.0012 U	0.0012 U	0.0012 U	0.001 []
	500	0.7	0.0012 U	0.0012 U	0.0012 U	0.001 U
Trans-1.2-Dichloroethene	500	0.19	0.0012 U	0.0012 U	0.0012 U	0.001 U
Trans-1.3-Dichloropropene	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Trichloroethylene (TCE)	200	0.47	0.0012 U	0.0012 U	0.0012 U	0.001 U
Trichlorofluoromethane	NS	NS	0.0012 U	0.0012 U	0.0012 U	0.001 U
Vinyl Chloride	13	0.02	0.0012 U	0.0012 U	0.0012 U	0.001 U

AKRF Sample ID Laboratory Sample ID Date Sampled Dilution Factor Unit			EP-13_1_20200612 460-210991-5 6/12/2020 1 mg/kg	EP-14_1_20200501 460-208010-1 5/01/2020 1 mg/kg	EP-X04_1_20200501 460-208010-7 5/01/2020 1 mg/kg	EP-15_1_20200501 460-208010-2 5/01/2020 1 mo/kg
Compound	NYSDEC CSCO					
1 1 1 Trichleroothana	500	0.68				
1, 1, 1- I ICHIOIOEthane	- SOO	0.00 NS			0.0011 U	0.0012 0
1 1 2-Trichloro-1 2 2-Trifluoroethane (Freon TE)	NS	NS		0.0011 U	0.0011 U	0.0012 0
1 1 2-Trichloroethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1 1-Dichloroethane	240	0.27	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1.1-Dichloroethene	500	0.33	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1.2.3-Trichlorobenzene	NS	NS	0.0011 UJ	0.0011 U	0.0011 U	0.0012 U
1.2.4-Trichlorobenzene	NS	NS	0.0011 UJ	0.0011 U	0.0011 U	0.0012 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1.2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1,2-Dichlorobenzene	500	1.1	0.00042 J	0.0011 U	0.0011 U	0.0012 U
1,2-Dichloroethane	30	0.02	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1,2-Dichloropropane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
1,3-Dichlorobenzene	280	2.4	0.0011 UJ	0.0011 U	0.0011 U	0.0012 U
1,4-Dichlorobenzene	130	1.8	0.00035 J	0.0011 U	0.0011 U	0.0012 U
2-Hexanone	NS	NS	0.0056 U	0.0054 U	0.0055 U	0.0059 U
Acetone	500	0.05	0.0067 U	0.0065 U	0.0066 U	0.055
Benzene	44	0.06	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Bromochloromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Bromodichloromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Bromoform	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Bromomethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Carbon Disulfide	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Carbon Tetrachloride	22	0.76	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Chlorobenzene	500	1.1	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Chloroethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Chloroform	350	0.37	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Chloromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Cis-1,2-Dichloroethylene	500	0.25	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Cis-1,3-Dichloropropene	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Cyclohexane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0015
Dibromochloromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Dichlorodifluoromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0012 U
Ethylbenzene	390	1	0.00082 J	0.0011 U	0.0011 U	0.00045 J
Isopropylbenzene (Cumene)	NS	NS	0.00028 J	0.0011 U	0.0011 U	0.008
M,P-Xylenes	NS	NS	0.0018 J	0.0003 J	0.0011 0	0.0016
Methyl Acetate	NS	NS 0.40	0.0056 UJ	0.0054 U	0.0055 0	0.0059 0
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.0056 U	0.0054 U	0.0055 0	0.012
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0056 0	0.0054 0	0.0055 0	0.0059 0
Methylone Chleride	NS 500	NS 0.05	0.0037 J			0.0038
Methylene Chloride		0.05	0.00099 J			0.0012 0
O-Aylerie (1,2-Dimetriyiberizerie)	INS NC	ING NC	0.0022 J			0.0016
Stylene Tert Rutyl Methyl Ethor	500					
Totrachlaraothylana (PCE)	150	0.90				0.014
	100	1.3				
Trans 1.2 Dichleroothons	500	0.10				
Trans-1,2-Dichloropropone		U. 19 NG				
Trichleroothylong (TCE)	200	0 /7				
		U.47 NC				
	INO 40					
Vinyi Unioriae	13	0.02	0.0011 0	0.0011 0	0.0011 0	0.0012 0

AKRF Sample ID Laboratory Sample ID Date Sampled		EP-16_1_20200501 460-208010-3 5/01/2020	EP-17_1_20200612 460-210991-1 6/12/2020	EP-18_1_20200612 460-210991-2 6/12/2020	EP-19_1_20200612 460-210991-3 6/12/2020	
		Dilution Factor	1 ma/ka	1 mg/kg	1 mg/kg	1 ma/ka
Compound						
1 1 1-Trichloroethane	500	0.68				
1,1,1,1-11chloroethane	NS	0.00 NS	0.00099.11	0.0012 U	0.00099 U	0.0014 U
1 1 2-Trichloro-1 2 2-Trifluoroethane (Freon TE)	NS	NS	0.0009911	0.0012 U	0.00099 U	0.0014 U
1 1 2-Trichloroethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,1-Dichloroethane	240	0.27	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1.1-Dichloroethene	500	0.33	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2,3-Trichlorobenzene	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2,4-Trichlorobenzene	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2-Dichlorobenzene	500	1.1	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2-Dichloroethane	30	0.02	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,2-Dichloropropane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,3-Dichlorobenzene	280	2.4	0.00099 U	0.0012 U	0.00099 U	0.0014 U
1,4-Dichlorobenzene	130	1.8	0.00099 U	0.0012 U	0.00099 U	0.0014 U
2-Hexanone	NS	NS	0.005 U	0.0058 U	0.0049 U	0.0069 U
Acetone	500	0.05	0.0059 U	0.007 U	0.0059 U	0.0083 U
Benzene	44	0.06	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Bromochloromethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Bromodichloromethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Bromoform	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Bromomethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Carbon Disulfide	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Carbon Tetrachloride	22	0.76	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Chlorobenzene	500	1.1	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Chloroethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Chloroform	350	0.37	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Chloromethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Cis-1,2-Dichloroethylene	500	0.25	0.00099 U	0.0012 U	0.00099 U	0.0014 U
	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Dibromochloromethane	NS	NS	0.00099 U	0.0012 U	0.00099 0	0.0014 U
	NS	NS	0.00099 U		0.00099 0	
	390	1	0.00099 U		0.00099 0	0.00032 J
Isopropyibenzene (Cumene)	NS NC	NS NC	0.00099 U	0.0012 U	0.00099 0	
Mathul Apotato	NO	INO NC	0.00099 0	0.0012 03	0.00099 00	0.00095 J
Methyl Ethyl Kotono (2 Putonono)	500	0.12	0.005 U	0.0058 U	0.0049 0	
Methyl Isobutyl Kotone (2-Bulanone)	500 NS	0.1Z	0.005 U	0.0058 U	0.0049 0	
Methylovclobexane	NS	NS	0.0009 11	0.0012 111	0.0009 111	0.0009 0
	500	0.05	0.00099.0	0.0012 05	0.00039 03	0.0011
$\Omega$ -Xylene (1.2-Dimethylbenzene)	NS	NS	0.00099.11	0.0012 0	0.00072.3	0.00038 1
Styrene	NS	NS	0.0009911	0.0012.00	0.00099 11	0.0014 11
Tert-Butyl Methyl Ether	500	0.93	0.0009911	0.0012 U.I	0.00099 111	0.0014 U.I
Tetrachloroethylene (PCF)	150	1.3	0.00099.11	0.0012 U	0,0009911	0 0014 U
	500	0.7	0.00099.11	0.0012 U	0.0009911	0 0014 U
Trans-1.2-Dichloroethene	500	0.19	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Trans-1,3-Dichloropropene	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Trichloroethylene (TCE)	200	0.47	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Trichlorofluoromethane	NS	NS	0.00099 U	0.0012 U	0.00099 U	0.0014 U
Vinyl Chloride	13	0.02	0.00099 U	0.0012 U	0.00099 U	0.0014 U

	Li	AKRF Sample ID aboratory Sample ID Date Sampled	EP-20_1_20200217 460-203168-11 2/17/2020	EP-21_1_20200501 460-208010-4 5/01/2020	EP-22_1_20200501 460-208010-5 5/01/2020	EP-23_1_20200226 460-203752-9 2/26/2020
		Unit	ma/ka	ma/ka	ma/ka	ma/ka
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q		CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2,2-Tetrachloroethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1,2-Trichloroethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1-Dichloroethane	240	0.27	0.001 U	0.0011 U	0.0011 U	0.001 U
1,1-Dichloroethene	500	0.33	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2,3-Trichlorobenzene	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2,4-Trichlorobenzene	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.001 UJ	0.0011 U	0.0011 U	0.001 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichlorobenzene	500	1.1	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichloroethane	30	0.02	0.001 U	0.0011 U	0.0011 U	0.001 U
1,2-Dichloropropane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
1,3-Dichlorobenzene	280	2.4	0.001 U	0.0011 U	0.0011 U	0.001 U
1,4-Dichlorobenzene	130	1.8	0.001 U	0.0011 U	0.0011 U	0.001 U
2-Hexanone	NS	NS	0.005 U	0.0056 U	0.0054 U	0.005 UJ
Acetone	500	0.05	0.006 U	0.0067 U	0.0065 U	0.041 J
Benzene	44	0.06	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromochloromethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromodichloromethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Bromoform	NS	NS	0.001 UJ	0.0011 U	0.0011 U	0.001 U
Bromomethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Carbon Disulfide	NS	NS	0.001 U	0.0011 U	0.0011 U	0.0007 J
Carbon Tetrachloride	22	0.76	0.001 U	0.0011 U	0.0011 U	0.001 U
Chlorobenzene	500	1.1	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloroethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Chloroform	350	0.37	0.001 U	0.0011 U	0.0011 U	0.00092 J
Chloromethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Cis-1,2-Dichloroethylene	500	0.25	0.001 U	0.0011 U	0.0011 U	0.001 U
Cis-1,3-Dichloropropene	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Cyclohexane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
Dibromochloromethane	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
	NS	NS	0.001 U	0.0011 U	0.0011 U	0.001 U
<u>Ethylbenzene</u>	390	1	0.001 U	0.0011 U	0.0011 U	0.001 U
Isopropyibenzene (Cumene)	NS	NS			0.0011 U	0.00016 J
M,P-Aylenes	NS	NS				0.00034 J
Methyl Acetate	NS E00	NS 0.40			0.0054 U	0.005 U
Methyl Looputul Ketone (2-Bulanone)	000 NIS	0.12	0.005 U		0.0054 U	0.005 UJ
Methyl Isobulyl Kelone (4-Melnyl-2-Penlanone)	INS NC	INS NC	0.005 0		0.0054 0	
Methylone Chloride	INS 500	NS 0.05				
Metrylene Chionde		0.00	0.001 U			
O-Aylerie (1,2-Dimetryberizerie)	INO NC	NS NS	0.001 U			0.00022 J
Tort Butyl Mothyl Ethor	INO 500					
	150	0.90				
	100	1.3				
Trans 1.2 Dichloroothons	500	0.1				
		0.19				
		U.47 NC				
	13	0.02	0.001 0	0.0011 0	0.0011 0	0.001 0

AKRF Sample ID			EP-24_1_20200226	EP-X3_1_20200226	EP-25_1_20200217	EP-26_1_20200217
	Li	aboratory Sample ID	460-203752-7	460-203752-8	460-203168-10	460-203168-13
		Date Sampled	2/26/2020	2/26/2020	2/17/2020	2/17/2020
		Dilution Factor	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,1,2,2-Tetrachloroethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,1,2-Trichloroethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,1-Dichloroethane	240	0.27	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,1-Dichloroethene	500	0.33	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,2,3- I richlorobenzene	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,2,4- I richlorobenzene	NS	NS	0.0012 U	0.0011 0	0.00099 U	0.001 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.0012 U	0.0011 0	0.00099 U	0.001 UJ
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
1,2-Dichloropenzene	500	1.1	0.0012 0		0.00099 0	0.001 U
	30 NS	0.02	0.0012 0		0.00099 0	
1,2-Dichloropropane	280	2.4	0.0012 0			
1,5-Dichlorobenzene	130	2.4	0.0012 0		0.00099 0	
	NS	1.0 NS	0.0012 0	0.0033 1	0.00099 0	0.001 0
	500	0.05	0.46 1		0.0049 0	0.005 0
Benzene	300 44	0.05	0.0012		0.0009 11	0.001 U
Bromochloromethane	NS	NS	0.0012 U	0.0011 U	0.00099 []	0.001 U
Bromodichloromethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Bromoform	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 UJ
Bromomethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Carbon Disulfide	NS	NS	0.00064 J	0.00064 J	0.00099 U	0.001 U
Carbon Tetrachloride	22	0.76	0.0012 U	0.0011 U	0.00099 U	0.001 U
Chlorobenzene	500	1.1	0.0012 U	0.0011 U	0.00099 U	0.001 U
Chloroethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Chloroform	350	0.37	0.00088 J	0.00084 J	0.00099 U	0.001 U
Chloromethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Cis-1,2-Dichloroethylene	500	0.25	0.0012 U	0.0011 U	0.00099 U	0.001 U
Cis-1,3-Dichloropropene	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Cyclohexane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Dibromochloromethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Dichlorodifluoromethane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Ethylbenzene	390	1	0.0012 U	0.0011 U	0.00099 U	0.001 U
Isopropylbenzene (Cumene)	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
M,P-Xylenes	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Methyl Acetate	NS	NS	0.0058 U	0.0055 U	0.0049 U	0.005 UT
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.1 J	0.18 J	0.0049 U	0.005 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0042 J	0.0044 J	0.0049 U	0.005 U
Methylcyclohexane	NS	NS	0.0012 U	0.0011 U	0.00099 U	0.001 U
Methylene Chloride	500	0.05	0.0012 U	0.0011 U	0.00099 U	0.001 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	0.0012 0		0.00099 0	0.001 0
Styrene	NS 500	NS 0.02	0.0012 U	0.0011 0		
	500	0.93		0.0037		
	150	1.3				
Trans 1.2 Dichloroothana	500	0.1				
		U. 19				
	6/I 200					
		U.47 NS				
	110					
	13	0.02	0.0012 0	0.0011 0	0.00099 0	0.001 0

AKRF Sample ID Laboratory Sample ID Date Sampled Dilution Factor			EP-27_1_20200217 460-203168-14 2/17/2020 1	EP-28_1_20200217 460-203168-5 2/17/2020 1	EP-29_1_20200217 460-203168-8 2/17/2020 1	EP-30_1_20200217 460-203168-9 2/17/2020 1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,1,2,2-Tetrachloroethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,1,2-Trichloroethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,1-Dichloroethane	240	0.27	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,1-Dichloroethene	500	0.33	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,2,3- I richlorobenzene	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,2,4- I richlorobenzene	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.0011 UJ	0.0011 U	0.0011 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
1,2-Dichlorobenzene	500	1.1	0.0011 U	0.0011 U	0.0011 U	0.0011 U
	30	0.02	0.0011 U	0.0011 U		0.0011 0
1,2-Dichloropropane	NS	NS 0.4				
1,3-Dichlorobenzene	280	2.4				
	130 NC	1.8	0.0011 0		0.0011 0	0.0011 0
	INS 500	NS	0.0054 0		0.0053 0	0.0055 0
Renzeno	500	0.05	0.001		0.034	0.027
Bromochloromothano	44 NS	0.00	0.00072 3		0.0004 J	
Bromodichloromothano	INS NS	NS				
Bromoform	NS NS	NS				
Bromomothano	NS NS	NS	0.0011 U			
	NS	NS	0.0017		0.00035 1	0.0001110
Carbon Tetrachloride	22	0.76	0.0011	0.0011 U	0.0011 U	0.00011
Chlorobenzene	500	1 1	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Chloroethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Chloroform	350	0.37	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Chloromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Cis-1 2-Dichloroethylene	500	0.25	0.00087 J	0.0011 U	0.0011 U	0.0011 U
Cis-1,3-Dichloropropene	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Cyclohexane	NS	NS	0.0013	0.0011 U	0.000 J	0.00094 J
Dibromochloromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Dichlorodifluoromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Ethvlbenzene	390	1	0.0011 U	0.0011 U	0.0048	0.0024
Isopropylbenzene (Cumene)	NS	NS	0.0011 U	0.0011 U	0.001 J	0.0041
M,P-Xylenes	NS	NS	0.0011 U	0.0011 U	0.024	0.067
Methyl Acetate	NS	NS	0.0054 UT	0.0055 U	0.0053 U	0.0055 U
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.0054 U	0.0055 U	0.006	0.0055 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0054 U	0.0055 U	0.0053 U	0.0055 U
Methylcyclohexane	NS	NS	0.0041	0.0011 U	0.002	0.0038
Methylene Chloride	500	0.05	0.0011 U	0.0011 U	0.0011 U	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	0.0011 U	0.0011 U	0.017	0.035
Styrene	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Tert-Butyl Methyl Ether	500	0.93	0.11	0.0011 U	0.0011 U	0.00042 J
Tetrachloroethylene (PCE)	150	1.3	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Toluene	500	0.7	0.0011 U	0.0011 U	0.0054	0.0026
Trans-1,2-Dichloroethene	500	0.19	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Trans-1,3-Dichloropropene	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Trichloroethylene (TCE)	200	0.47	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Trichlorofluoromethane	NS	NS	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Vinyl Chloride	13	0.02	0.0011 U	0.0011 U	0.0011 U	0.0011 U

AKRF Sample ID Laboratory Sample ID Date Sampled Dilution Factor			EP-31_1_20200217 460-203168-12 2/17/2020 1	EP-32_1_20200217 460-203168-4 2/17/2020 1	EP-X2_1_20200217 460-203168-6 2/17/2020 1	EP-33_1_20200217 460-203168-3 2/17/2020 1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,1,2,2-Tetrachloroethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,1,2-Trichloroethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,1-Dichloroethane	240	0.27	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,1-Dichloroethene	500	0.33	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,2,3-Trichlorobenzene	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,2,4-Trichlorobenzene	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.0012 UJ	0.0011 U	0.0011 UJ	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,2-Dichlorobenzene	500	1.1	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,2-Dichloroethane	30	0.02	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,2-Dichloropropane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,3-Dichlorobenzene	280	2.4	0.0012 U	0.0011 U	0.0011 U	0.0011 U
1,4-Dichlorobenzene	130	1.8	0.0012 U	0.0011 U	0.0011 U	0.0011 U
2-Hexanone	NS	NS	0.0061 U	0.0057 U	0.0056 U	0.0054 U
Acetone	500	0.05	0.25	0.0069 U	0.0067 U	0.0065 U
Benzene	44	0.06	0.0047	0.0011 U	0.0011 U	0.0011 U
Bromochloromethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Bromodichloromethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Bromotorm	NS	NS	0.0012 UJ	0.0011 U	0.0011 UJ	0.0011 U
Bromomethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Carbon Disulfide	NS	NS 0.70	0.0018			0.00031 J
	22	0.76	0.0012 0			
Chloropenzene	500 NC		0.0012 0			
Chloroform	250	0.27	0.0012 0			
Chloromothana		0.37	0.0012 0			
	500	0.25	0.0012 0			
Cis 1 3 Dichloropropene	NS	0.23 NS	0.00034 5	0.0011 U		
	NS	NS	0.0012 0	0.0011 U	0.0011 U	0.0011 U
Dibromochloromethane	NS	NS	0.0022	0.0011	0.0011 U	0.0011 U
Dichlorodifluoromethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Ethylbenzene	390	1	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Isopropylbenzene (Cumene)	NS	NS	0.00054 .1	0.0011 U	0.0011 U	0.0011 U
M P-Xvlenes	NS	NS	0.0012 U	0.0007 J	0.0011 U	0.00039 J
Methyl Acetate	NS	NS	0.0061 UT	0.0057 U	0.0056 UT	0.0054 U
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.0061 U	0.0057 U	0.0056 U	0.0054 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0061 U	0.0057 U	0.0056 U	0.0054 U
Methylcyclohexane	NS	NS	0.011	0.00059 J	0.0011 U	0.0011 U
Methylene Chloride	500	0.05	0.0012 U	0.0011 U	0.0011 U	0.0011 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	0.0016	0.00042 J	0.0011 U	0.0011 U
Styrene	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Tert-Butyl Methyl Ether	500	0.93	0.23	0.0011 U	0.0011 U	0.0011 U
Tetrachloroethylene (PCE)	150	1.3	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Toluene	500	0.7	0.00038 J	0.00031 J	0.0011 U	0.00025 J
Trans-1,2-Dichloroethene	500	0.19	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Trans-1,3-Dichloropropene	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Trichloroethylene (TCE)	200	0.47	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Trichlorofluoromethane	NS	NS	0.0012 U	0.0011 U	0.0011 U	0.0011 U
Vinyl Chloride	13	0.02	0.0012 U	0.0011 U	0.0011 U	0.0011 U

AKRF Sample ID			EP-34_1_20200217	EP-35_1_20200203	EP-36_1_20200204	EP-37_1_20200204
Laboratory Sample ID			460-203168-7	460-202180-7	460-202292-7	460-202292-8
		Date Sampled	2/17/2020	2/03/2020	2/04/2020	2/04/2020
		Dilution Factor	1	1	1	1
			mg/kg	mg/kg	mg/kg	mg/kg
	NYSDEC CSCO	NYSDEC PGWSCO				
1,1,1-I richloroethane	500	0.68	0.0011 U	0.00095 U	0.00098 U	0.00087 U
1,1,2,2- I etrachioroethane	NS	NS	0.0011 U		0.00098 0	0.00087 0
1,1,2-1 richloro-1,2,2-1 rifluoroethane (Freon 1F)	NS	NS	0.0011 U		0.00098 0	0.00087 U
1,1,2-I richloroethane	NS 040	NS 0.07	0.0011 U	0.00095 U	0.00098 U	0.00087 U
1,1-Dichloroethane	240	0.27	0.0011 U		0.00098 0	0.00087 0
		0.33				0.00087 U
	INS NS	NS NS				0.00087 U
1,2,4-Thchloroberizerie	NS NS	NS		0.00095 0	0.00098 0	0.00087 U
1,2-Dibromo-3-Chloropropane	NS NS	NS	0.0011 U	0.00095 0	0.00098 U	0.00087 U
	500	1 1		0.00095 U	0.00098 U	0.00087 U
1.2-Dichloroethane	30	0.02	0.0011 U	0.00095 U	0.00098 U	0.00087 U
1.2-Dichloropropane	NS	NS	0.0011 U	0.00095 U	0.00098 11	0.00087 11
1.3-Dichlorobenzene	280	24	0.0011 U	0.00095 U	0.00098 U	0.00087 U
1.4-Dichlorobenzene	130	1.8	0.0011 U	0.00095 U	0.00098 U	0.00087 U
2-Hexanone	NS	NS	0.0054 U	0.0048 U	0.0049 U	0.0043 U
Acetone	500	0.05	0.0064 J	0.0057 UJ	0.0065	0.014
Benzene	44	0.06	0.0017	0.00095 U	0.00098 U	0.00052 J
Bromochloromethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Bromodichloromethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Bromoform	NS	NS	0.0011 UJ	0.00095 U	0.00098 U	0.00087 U
Bromomethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Carbon Disulfide	NS	NS	0.00066 J	0.00095 U	0.00098 U	0.00031 J
Carbon Tetrachloride	22	0.76	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Chlorobenzene	500	1.1	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Chloroethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Chloroform	350	0.37	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Chloromethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Cis-1,2-Dichloroethylene	500	0.25	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Cis-1,3-Dichloropropene	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Cyclohexane	NS	NS	0.0011 U	0.00095 UJ	0.00098 U	0.00087 U
Dibromochloromethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Dichlorodifluoromethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Ethylbenzene	390	1	0.0034	0.00095 U	0.00098 U	0.00068 J
Isopropylbenzene (Cumene)	NS	NS	0.00017 J	0.00095 UJ	0.00098 U	0.00087 U
M,P-Xylenes	NS	NS	0.0092	0.00047 J	0.00068 J	0.0017
Methyl Acetate	NS	NS	0.0054 UT	0.0048 U	0.0049 U	0.0043 U
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.0054 U	0.0048 U	0.0049 U	0.0043 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0054 0	0.0048 0	0.0049 0	0.0043 U
Methylcyclonexane	NS F00	NS	0.0011 U	0.00095 UJ	0.0015	0.00087 0
Methylene Chloride	500	0.05			0.00047 J	0.00048 J
	INS NC	NS NC	0.00099 J	0.00031 J	0.00099 0	0.00093 0
Stylene Tert-Butyl Methyl Ether	500	601 20 0				
Tetrachloroethylene (DCE)	150	0.90		0.00095.0		
	500	1.3 0 7		0.00095.0	0.00090 0	
Trans-1 2-Dichloroethene	500	0.7	0.0011	0.00025.0	0.00098 11	0.00087 U
Trans-1,2 Dichloropropene	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Trichloroethylene (TCE)	200	0.47	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Trichlorofluoromethane	NS	NS	0.0011 U	0.00095 U	0.00098 U	0.00087 U
Vinvl Chloride	13	0.02	0.0011 U	0.00095 U	0.00098 U	0.00087 U
		0.02	0.0011 0	0.000000		

Date Sampled Dilution Factor Unit         204/2020 1         204/2020 204/2020         204/2020 204/2020         204/2020 204/2020         204/2020 204/2020         204/2020         200/2020         1
Date Sample         Date Sample <thdate sample<="" th=""> <thdate sample<="" th=""></thdate></thdate>
Unit         mg/kg
Compound         NYSDEC CSCO         NYSDEC PGWSCO         CONC Q
Comporting         INSUE occor         Convert
Intraction         Society         Count of the second of t
International field         International field <thinternat< th="">         International field         <thi< td=""></thi<></thinternat<>
International function         Internation         Internation <thinternation<< td=""></thinternation<<>
International         Internat
International         Dro         Order
1.2.3-Trichlorobenzene         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2.3-Trichlorobenzene         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2.4-Trichlorobenzene         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dibrom-3-Chloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dibromethane (Ethylene Dibromide)         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         500         1.1         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         30         0.022         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         30         0.022         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U
Instrume
I.2-Dibromo-3-Chloropropane         NS         NS         NS         0.00098 UT         0.0011 U         0.00097 U         0.00097 U           1.2-Dibromoethane (Ethylene Dibromide)         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         500         1.1         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         30         0.02         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.2-Dichlorobenzene         280         2.4         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1.3-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.00097 U
1,2-Dibromoethane (Ethylene Dibromide)         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichlorobenzene         500         1.1         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichlorobenzene         30         0.02         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichloroptopane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichloroptopane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,3-Dichlorobenzene         280         2.4         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0011 U         0.00049 U         0.00048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.00058 U           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromo
1,2-Dichlorobenzene         500         1.1         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichlorobenzene         30         0.02         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,3-Dichlorobenzene         280         2.4         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.0097 U           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS
1,2-Dichloroethane         30         0.02         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,2-Dichloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,3-Dichlorobenzene         280         2.4         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.0058 UJ           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
1,2-Dichloropropane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,3-Dichlorobenzene         280         2.4         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0015 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.0058 UJ           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00058 J         0.00097 U
1,3-Dichlorobenzene         280         2.4         0.00098 U         0.0011 U         0.00097 U         0.00097 U           1,4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.0058 UJ           Benzene         44         0.06         0.00054 J         0.0018         0.00097 U         0.00097 U           Bromochloromethane         NS         NS         0.00054 J         0.0018         0.00097 U         0.00097 U
1,4-Dichlorobenzene         130         1.8         0.00098 U         0.0011 U         0.00097 U         0.00097 U           2-Hexanone         NS         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.0058 UJ           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
2-Hexanone         NS         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U           Acetone         500         0.05         0.028         0.047         0.0058 U         0.0058 UJ           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Acetone         500         0.05         0.028         0.047         0.0058 U         0.0058 UJ           Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Benzene         44         0.06         0.00054 J         0.0018         0.00028 J         0.00097 U           Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Bromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Bromodichloromethane         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Bromoform NS NS 0.00098 U 0.0011 U 0.00097 U 0.00097 U
Bromomethane NS NS 0.00098 U 0.0011 U 0.00097 U 0.00097 U
Carbon Disulfide NS NS 0.00098 U 0.0014 0.00041 J 0.00097 U
Carbon Tetrachloride 22 0.76 0.00098 U 0.0011 U 0.00097 U 0.00097 U
Chlorobenzene         500         1.1         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Chloroethane         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Chloroform 350 0.37 0.00098 U 0.0011 U 0.00097 U 0.00097 U
Chloromethane         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Cis-1,2-Dichloroethylene 500 0.25 0.00098 U 0.0011 U 0.00097 U 0.00097 U
Cis-1,3-Dichloropropene         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Cyclohexane         NS         NS         0.0069         0.0011 U         0.00097 U         0.00097 UJ
Dibromochloromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Dichlorodifluoromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Ethylbenzene         390         1         0.00089 J         0.0028         0.00075 J         0.00097 U
Isopropylbenzene (Cumene)         NS         NS         0.0014         0.00035 J         0.00097 U         0.00097 UJ
M,P-Xylenes NS NS 0.011 0.018 0.0049 0.00097 U
Methyl Acetate         NS         0.0049 U         0.0055 U         0.0049 U         0.0048 U
Methyl Ethyl Ketone (2-Butanone)         500         0.12         0.0049 U         0.01         0.0049 U         0.0048 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone) NS NS 0.0049 U 0.0055 U 0.0049 U 0.0049 U 0.0048 U
Methylcyclonexane         NS         NS         0.025         0.0011 U         0.00097 U         0.00097 UJ
Methylene Chloride         500         0.05         0.00098 U         0.00058 J         0.00052 J         0.00097 U           O Xulana (1.2 Dimethylhenzana)         NS         0.12         0.001 U         0.00007 U         0.00007 U
O-Xylene (1,2-Dimetrifyiberizene)         NS         NS         0.12         0.0010         0.000970         0.000970           Styrene         NS         NS         0.0009811         0.001411         0.0000711         0.0000711
Original         NO         NO         0.00090 U         0.0011 U         0.00097 U         0.00097 U           Text Butyl Methyl Ether         500         0.03         0.00054 U         0.0011 U         0.00007 U         0.00007 U
Tetrachloroethylene (PCE)         150         13         0.00034.3         0.0011.0         0.00097.0         0.00097.0
Toluene 500 0.7 0.0024 0.0008 0 0.0009 0 0.0009 0 0.0009 0 0.0009 0
Trans-1.2-Dichloroethene         500         0.19         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Trans-1,3-Dichloropropene         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Trichloroethylene (TCE)         200         0.47         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Trichlorofluoromethane         NS         NS         0.00098 U         0.0011 U         0.00097 U         0.00097 U
Vinyl Chloride         13         0.02         0.00098 U         0.0011 U         0.00097 U         0.00097 U

AKRF Sample ID			EP-42_1_20200203	EP-X1_1_20200203	EP-43_1_20200204	EP-44_1_20200204
Laboratory Sample ID			460-202180-3	460-202180-6	460-202292-3	460-202292-4
		Date Sampled	2/03/2020	2/03/2020	2/04/2020	2/04/2020
		Dilution Factor	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,1,2,2-Tetrachloroethane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,1,2-Trichloroethane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,1-Dichloroethane	240	0.27	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,1-Dichloroethene	500	0.33	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2,3-Trichlorobenzene	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2,4- I richlorobenzene	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2-Dichlorobenzene	500	1.1	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2-Dichloroethane	30	0.02	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,2-Dichloropropane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,3-Dichlorobenzene	280	2.4	0.00094 U	0.0011 U	0.00089 U	0.0011 U
1,4-Dichlorobenzene	130	1.8	0.00094 U	0.0011 U	0.00089 U	0.0011 U
2-Hexanone	NS	NS	0.0047 U	0.0054 U	0.0044 U	0.0056 U
Acetone	500	0.05	0.014 J	0.0064 UJ	0.0079	0.037
Benzene	44	0.06	0.00094 U	0.0011 U	0.00054 J	0.0011 U
Bromochloromethane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Bromodichloromethane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Bromoform	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Bromomethane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Carbon Disulfide	NS	NS	0.00094 U	0.0011 U	0.0004 J	0.0004 J
Carbon Letrachloride	22	0.76	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Chlorobenzene	500	1.1	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Chloroethane	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
Chloroform	350	0.37	0.00094 U	0.0011 U	0.00089 U	0.0011 0
	NS	NS	0.00094 U	0.0011 U	0.00089 U	0.0011 U
	500	0.25	0.00094 0		0.00089 0	
	NS	NS	0.00094 0		0.00089 0	
Cyclonexane	NS	NS NC	0.0061 J		0.00089 0	
Dipromocniorometnane	NS	NS	0.00094 0		0.00089 0	
	NS 200	NS 4	0.00094 0		0.00089 0	
	390 NG		0.0043	0.00022 J	0.0036	
M D Xvlanaa	INS NS	NS NC	0.0011 J	0.0011 03	0.0012	0.00015 J
Mathyl Apatata	INS NC	NS NC	0.039 J	0.00056 J	0.017	0.00057 J
Methyl Acelale	NS 500	0.12	0.0047 0	0.0054 U	0.0044 0	
Methyl Leobutyl Ketone (2-Dulanone)		0.12	0.0047 0	0.0054 0	0.0044 0	0.0045 J
Methyl Isobulyl Kelone (4-Melnyl-2-Penlanone)	INS NC	NS NC	0.0047 0	0.0054 0	0.0044 0	0.0056 0
Methylone Chloride	NS 500	NS 0.05	0.013 J	0.0011 H	0.0055	
Methylene Chionde		0.00	0.00094 0		0.00056 J	0.00071 J
O-Aylerie (1,2-Dimetryberizerie)	ING NC	NO	0.037 5	0.00037 J	0.028	0.0039 B
Tert Rutyl Methyl Ethor	500	0.02				
Totrachlaroothylana (DCE)	300	0.90				
	100	1.3			0.0008 0	
Trans 1.2 Dichloroothopo	500	0.10				
Trans 1.3 Dichloropropopo	NIC	U. 13 NC				
Trichloroethylene (TCE)	200	0.47				
		0.47 NQ				
	12					
	13	0.02	0.00094 0	0.0011 0	0.00009 0	0.0011 0
		AKRF Sample ID	EP-45_1_20200204	EP-46_1_20200203	EP-47_1_20200204	EP-48_1_20200204
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	Li	aboratory Sample ID	400-202292-5	400-202160-1	400-202292-2	400-202292-1
		Date Sampled	2/04/2020	2/03/2020	2/04/2020	2/04/2020
		Dilution Factor	l ma/ka	n ma/ka	n na/ka	n na/ka
Compound						
1 1 1 Trichlereethane	500	0.69				
1,1,1-Thomorethane	NS	0.00 NS	0.00095 U	0.00094 U	0.00099 0	0.00098 U
1 1 2-Trichloro-1 2 2-Trifluoroethane (Freon TE)	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1 1 2-Trichloroethane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1.1-Dichloroethane	240	0.27	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,1-Dichloroethene	500	0.33	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2,3-Trichlorobenzene	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2,4-Trichlorobenzene	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2-Dichlorobenzene	500	1.1	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2-Dichloroethane	30	0.02	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,2-Dichloropropane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,3-Dichlorobenzene	280	2.4	0.00095 U	0.00094 U	0.00099 U	0.00098 U
1,4-Dichlorobenzene	130	1.8	0.00095 U	0.00094 U	0.00099 U	0.00098 U
2-Hexanone	NS	NS	0.0048 U	0.0047 U	0.0049 U	0.0049 U
Acetone	500	0.05	0.015	0.0056 UJ	0.013	0.015
Benzene	44	0.06	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Bromochloromethane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Bromodichloromethane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Bromotorm	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Bromomethane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Carbon Disulfide	NS 22	NS 0.76	0.00028 J	0.00094 0	0.00099 0	0.00043 J
	22 500	0.76		0.00094 0		
Chloroothana	500 NS	I.I NS		0.00094 0	0.00099 0	0.00098 U
Chloroform	350	0.37	0.00095 0	0.00094 0	0.00099 0	0.00098 U
Chloromethane	NS	NS	0.00095 U	0.00094 U	0.00099 11	0.00098 11
Cis-1 2-Dichloroethylene	500	0.25	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Cis-1 3-Dichloropropene	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Cyclohexane	NS	NS	0.00095 U	0.00094 UJ	0.00032 J	0.00023 J
Dibromochloromethane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Dichlorodifluoromethane	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Ethylbenzene	390	1	0.0017	0.00094 U	0.00038 J	0.00078 J
Isopropylbenzene (Cumene)	NS	NS	0.00013 J	0.00094 UJ	0.00099 U	0.00059 J
M,P-Xylenes	NS	NS	0.018	0.00094 U	0.0025	0.0014
Methyl Acetate	NS	NS	0.0048 U	0.0047 U	0.0049 U	0.0049 U
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.0048 U	0.0047 U	0.0049 U	0.0049 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0048 U	0.0047 U	0.0049 U	0.0049 U
Methylcyclohexane	NS	NS	0.00095 U	0.00094 UJ	0.00089 J	0.00092 J
Methylene Chloride	500	0.05	0.00058 J	0.00094 U	0.00064 J	0.0006 J
O-Xylene (1,2-Dimethylbenzene)	NS	NS	0.0011 U	0.0002 J	0.0014 U	0.0053 B
Styrene	NS	NS	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Tert-Butyl Methyl Ether	500	0.93	0.00095 U	0.00094 U	0.00099 U	0.00028 J
I etrachloroethylene (PCE)	150	1.3	0.00095 U	0.00094 U	0.00099 U	0.00098 U
	500	0.7	0.00095 U	0.00094 UJ	0.0006 J	0.00098 U
I rans-1,2-Dichloroethene	500	0.19	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Triablereathdana (TOC)	NS 000	NS 0.47	0.00095 U	0.00094 U	0.00099 U	0.00098 U
	200	0.47		0.00094 U		
		NS				
	13	U.UZ	0.00095 0	0.00094 U	0.00099 0	0.00098 0

	L	AKRF Sample ID aboratory Sample ID Date Sampled Dilution Eactor	EP-49_7_20200226 460-203752-6 2/26/2020 1	SW-01_4_20200226 460-203752-2 2/26/2020	SW-02_4_20200226 460-203752-3 2/26/2020	SW-03_4_20200226 460-203752-4 2/26/2020
		Unit	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,1,2,2-Tetrachloroethane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,1,2-Trichloroethane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,1-Dichloroethane	240	0.27	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,1-Dichloroethene	500	0.33	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2,3-Trichlorobenzene	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2,4-Trichlorobenzene	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dichlorobenzene	500	1.1	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dichloroethane	30	0.02	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,2-Dichloropropane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,3-Dichlorobenzene	280	2.4	0.002 U	0.0012 U	0.0012 U	0.0012 U
1,4-Dichlorobenzene	130	1.8	0.002 U	0.0012 U	0.0012 U	0.0012 U
2-Hexanone	NS	NS	0.01 UJ	0.0061 U	0.006 U	0.006 U
Acetone	500	0.05	0.065 J	0.076	0.037	0.072
Benzene	44	0.06	0.002 U	0.00052 J	0.0012 U	0.0009 J
Bromochloromethane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Bromodichloromethane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Bromotorm	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Bromomethane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Carbon Disulfide	NS 00	NS	0.002 U	0.00068 J	0.00073 J	0.00058 J
Carbon Tetrachioride	22	0.76	0.002 0	0.0012 0		0.0012 0
	500	1.1 NC	0.002 U	0.0012 U	0.0012 U	0.0012 U
Chloroform	NS 250	NS 0.27	0.002 U	0.0012 0	0.0012 U	
Chloromothana	330 NS	0.37	0.002 0		0.0012 0	
	500	0.25	0.002 0	0.0012 0	0.0012 0	
Cis-1,2-Dichloropropene	NS	0.23 NS	0.002.0	0.0012 0	0.0012 0	0.0012 0
Cyclobexape	NS	NS	0.002 0	0.0012 0	0.0012 0	0.0012 0
Dibromochloromethane	NS	NS	0.002 11	0.0012 U	0.0012 U	0.0013
Dichlorodifluoromethane	NS	NS	0.002.111	0.0012 U.I	0.0012 U.I	0.0012 U.I
Ethylbenzene	390	1	0.002 U	0.0022	0.00029.1	0.0031
Isopropylbenzene (Cumene)	NS	NS	0.0098	0.0012	0.0005 J	0.0057
M.P-Xvlenes	NS	NS	0.0026	0.018	0.00085 J	0.03
Methyl Acetate	NS	NS	0.01 U	0.0061 U	0.006 U	0.006 U
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.014 J	0.011	0.0042 J	0.018
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.01 U	0.0061 U	0.006 U	0.0025 J
Methylcyclohexane	NS	NS	0.0055	0.0032	0.0012 U	0.0052
Methylene Chloride	500	0.05	0.002 U	0.0012 U	0.0012 U	0.0012 U
O-Xylene (1,2-Dimethylbenzene)	NS	NS	0.003	0.019	0.00036 J	0.017
Styrene	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Tert-Butyl Methyl Ether	500	0.93	0.046	0.0052	0.0027	0.00075 J
Tetrachloroethylene (PCE)	150	1.3	0.002 U	0.0012 U	0.0012 U	0.0012 U
Toluene	500	0.7	0.00047 J	0.004	0.0012 U	0.0016
Trans-1,2-Dichloroethene	500	0.19	0.002 U	0.0012 U	0.0012 U	0.0012 U
Trans-1,3-Dichloropropene	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Trichloroethylene (TCE)	200	0.47	0.002 U	0.0012 U	0.0012 U	0.0012 U
Trichlorofluoromethane	NS	NS	0.002 U	0.0012 U	0.0012 U	0.0012 U
Vinyl Chloride	13	0.02	0.002 U	0.0012 U	0.0012 U	0.0012 U

	L	AKRF Sample ID aboratory Sample ID Date Sampled	SW-04_4_20200226 460-203752-5 2/26/2020	SW-04_3_20200501 460-208010-6 5/01/2020	EP-FB-04_20200501 460-208010-9 5/01/2020	FB-03_20200226 460-203752-10 2/26/2020
		Unit	ı ma/ka	ma/ka	ua/L	ua/L
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	500	0.68	0.0012 U	0.0011 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,1,2-Trichloroethane	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,1-Dichloroethane	240	0.27	0.0012 U	0.0011 U	1 U	1 U
1,1-Dichloroethene	500	0.33	0.0012 U	0.0011 U	1 U	1 U
1,2,3-Trichlorobenzene	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,2,4-Trichlorobenzene	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	NS	NS	0.0012 U	0.0011 U	1 UJ	1 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,2-Dichlorobenzene	500	1.1	0.0012 U	0.0011 U	1 U	1 U
1,2-Dichloroethane	30	0.02	0.0012 U	0.0011 U	1 U	1 U
1,2-Dichloropropane	NS	NS	0.0012 U	0.0011 U	1 U	1 U
1,3-Dichlorobenzene	280	2.4	0.0012 U	0.0011 U	1 U	1 U
1,4-Dichlorobenzene	130	1.8	0.0012 U	0.0011 U	1 U	1 U
2-Hexanone	NS	NS	0.0058 U	0.0055 U	5 U	5 U
Acetone	500	0.05	0.078	0.0066 U	6.4	5 U
Benzene	44	0.06	0.0022	0.0011 U	1 U	1 U
Bromochloromethane	NS	NS	0.0012 U	0.0011 U	<u>1 U</u>	<u>1 U</u>
Bromodichloromethane	NS	NS	0.0012 U	0.0011 U	10	10
Bromoform	NS	NS	0.0012 U	0.0011 U	10	10
Bromomethane	NS	NS	0.0012 U	0.0011 U	10	10
Carbon Disulfide	NS	NS 0.70	0.0013	0.0011 U	10	10
Carbon Tetrachloride	22	0.76	0.0012 U	0.0011 U	10	10
	500	1.1	0.0012 U			10
Chloroethane	NS 250	NS 0.07	0.0012 0			10
Chloromothana	350	0.37	0.00097 J			
Chloromethane	INS 500	NS 0.25	0.0012 0			
		0.20	0.0012 0			1 1
		INO NG	0.0012 0			1 1
Dibromochloromothano	NS	INS NS	0.0020			1 1
Dichlorodifluoromethane	NS	NS	0.0012 0		1 1	1 11
Ethylbenzene	300	1	0.0012 0		1 1	1 11
Linyibenzene Isopropyibenzene (Cumene)	NS	I NS	0.0021	0.0011 U		1
M P-Xvlenes	NS	NS	0.0021	0.0011 U		1
Methyl Acetate	NS	NS	0.0058 []	0.0055 11	5 UT	5 11
Methyl Ethyl Ketone (2-Butanone)	500	0.12	0.0000 0	0.0055 U	5 11	5.0
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	0.0053 .1	0.0055 U	5.0	5.0
Methylicyclohexane	NS	NS	0.0087	0.0011 U		1 11
Methylene Chloride	500	0.05	0.0012 U	0.0011 U	1 U	1 U
O-Xylene (1.2-Dimethylbenzene)	NS	NS	0.044	0.0011 U	1 U	1 U
Styrene	NS	NS	0.0012 U	0.0011 U	1 U	1 U
Tert-Butyl Methyl Ether	500	0.93	0.0028	0.0011 U	1 U	1 U
Tetrachloroethylene (PCE)	150	1.3	0.0012 U	0.0011 U	1 U	1 U
Toluene	500	0.7	0.026	0.0011 U	1 U	0.63 J
Trans-1,2-Dichloroethene	500	0.19	0.0012 U	0.0011 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	NS	0.0012 U	0.0011 U	1 U	1 U
Trichloroethylene (TCE)	200	0.47	0.0012 U	0.0011 U	1 U	1 U
Trichlorofluoromethane	NS	NS	0.0012 U	0.0011 U	1 U	1 U
Vinyl Chloride	13	0.02	0.0012 U	0.0011 U	1 U	1 U

	L	AKRF Sample ID aboratory Sample ID Date Sampled	FB-1_20200203 460-202180-5 2/03/2020	FB-2_20200217 460-203168-2 2/17/2020	EP-TB-04_20200501 460-208010-8 5/01/2020	TB-03_20200128 460-203752-1 2/26/2020
		Dilution Factor Unit	1 ug/L	1 ug/L	1 ug/L	1 ug/L
Compound	NYSDEC CSCO	NYSDEC PGWSCO				
1.1.1-Trichloroethane	500	0.68	1 U	1 U	1 U	1 U
1.1.2.2-Tetrachloroethane	NS	NS	1 UJ	1 U	1 U	1 U
1.1.2-Trichloro-1.2.2-Trifluoroethane (Freon TF)	NS	NS	1 UT	1 U	1 U	1 U
1,1,2-Trichloroethane	NS	NS	1 U	1 U	1 U	1 U
1,1-Dichloroethane	240	0.27	1 U	1 U	1 U	1 U
1,1-Dichloroethene	500	0.33	1 UJ	1 U	1 U	1 U
1,2,3-Trichlorobenzene	NS	NS	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	NS	NS	1 U	1 U	1 U	1 U
1,2-Dibromo-3-Chloropropane	NS	NS	1 U	1 U	1 UJ	1 U
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	500	1.1	1 U	1 U	1 U	1 U
1,2-Dichloroethane	30	0.02	1 U	1 U	1 U	1 U
1,2-Dichloropropane	NS	NS	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	280	2.4	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	130	1.8	1 U	1 U	1 U	1 U
2-Hexanone	NS	NS	5 U	5 U	5 U	5 U
Acetone	500	0.05	5 U	5 U	5.7	5 U
Benzene	44	0.06	1 U	1 U	1 U	1 U
Bromochloromethane	NS	NS	1 U	1 U	1 U	1 U
Bromodichloromethane	NS	NS	1 U	1 U	1 U	1 U
Bromoform	NS	NS	1 U	1 U	1 U	1 U
Bromomethane	NS	NS	1 U	1 U	1 U	1 U
Carbon Disulfide	NS	NS	1 U	1 U	1 U	1 U
Carbon Tetrachloride	22	0.76	1 UJ	1 U	1 U	1 U
Chlorobenzene	500	1.1	1 U	1 U	1 U	1 U
Chloroethane	NS	NS	1 U	1 U	1 UT	1 U
Chloroform	350	0.37	1 U	1 U	1 U	1 U
Chloromethane	NS	NS	1 U	1 U	1 U	<u>1 U</u>
Cis-1,2-Dichloroethylene	500	0.25	1 U	10	10	10
Cis-1,3-Dichloropropene	NS	NS	10	10	10	10
Cyclohexane	NS	NS	<u>1 UT</u>	10	10	10
Dibromochloromethane	NS	NS	1 U	10	10	10
Dichlorodifluoromethane	NS	NS	10	10	10	10
<u>Ethylbenzene</u>	390	1	10	10	10	10
Isopropylbenzene (Cumene)	NS	NS	10	10	10	10
M,P-Xylenes	NS	NS	10	10	10	1.1
Methyl Acetate	NS F00	NS 0.40	5 U	50	5 01	50
Methyl Ethyl Ketone (2-Butanone)	500	0.12	50	50	50	50
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS NO	NS	50	50	50	50
Methylogia Chlarida	NS	NS 0.05	1 UJ	10	10	
Methylene Chloride	500	0.05	10	10	10	0.49 J
O-Xylene (1,2-Dimethylbenzene)	INS NC	NS NC	10			0.44 J
Styrene Tort Rutyl Motbyl Ethor	INO 500		1 U 4 1 I			
Tetrepheroothylens (DCC)	500	0.93				
	100	1.3	1 U 4 1 I			
Trans 1.2 Dichleroothons	500	0.1				
Trans 1.2 Dichloropropone		0.19	1 U			
Trichleroothylong (TCE)		INS 0.47				
		0.47 NQ	1 U			
Vipyl Chlorido	10		1 U			
	13	0.02		ΪŪ	ĨŬ	ĨŬ

		AKRE Sample ID	TB_1 20200203	TB-2 20200217
		aboratory Sample ID	460-202180-4	460-203168-1
	L .	Dato Sample ID	2/03/2020	2/17/2020
		Date Sampled	2/03/2020	1
		Dilution Factor		
Compound				
	NTSDEC CSCO	NTSDEC PGWSCO		
1,1,1-I richloroethane	500	0.68	10	10
	NS	NS	1 UJ	10
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	NS	NS	101	10
1,1,2-I richloroethane	NS	NS	10	10
1,1-Dichloroethane	240	0.27	10	10
1,1-Dichloroethene	500	0.33	<u> </u>	10
1,2,3- I richlorobenzene	NS	NS	10	10
1,2,4-Trichlorobenzene	NS	NS	10	10
1,2-Dibromo-3-Chloropropane	NS	NS	1 U	10
1,2-Dibromoethane (Ethylene Dibromide)	NS	NS	1 U	1 U
1,2-Dichlorobenzene	500	1.1	1 U	1 U
1,2-Dichloroethane	30	0.02	1 U	1 U
1,2-Dichloropropane	NS	NS	1 U	1 U
1,3-Dichlorobenzene	280	2.4	1 U	1 U
1,4-Dichlorobenzene	130	1.8	1 U	1 U
2-Hexanone	NS	NS	5 U	5 U
Acetone	500	0.05	5 U	5 U
Benzene	44	0.06	1 U	1 U
Bromochloromethane	NS	NS	1 U	1 U
Bromodichloromethane	NS	NS	1 U	1 U
Bromoform	NS	NS	1 U	1 U
Bromomethane	NS	NS	1 U	1 U
Carbon Disulfide	NS	NS	1 U	1 U
Carbon Tetrachloride	22	0.76	1 UJ	1 U
Chlorobenzene	500	1.1	1 U	1 U
Chloroethane	NS	NS	1 U	1 U
Chloroform	350	0.37	1 U	1 U
Chloromethane	NS	NS	1 U	1 U
Cis-1.2-Dichloroethylene	500	0.25	1 U	1 U
Cis-1,3-Dichloropropene	NS	NS	1 U	1.0
Cyclohexane	NS	NS	1 UT	1.0
Dibromochloromethane	NS	NS	1 U	1 U
Dichlorodifluoromethane	NS	NS	1	1 U
Ethylbenzene	390	1	1	
Isopropylbenzene (Cumene)	NS	N.S.	1	
M P-Xvlenes	NS	NS	14	
Methyl Acetate	NS	NS	5 11	5.11
Methyl Ethyl Ketone (2-Butanone)	500	0.12	5 11	5.11
Methyl Isohutyl Ketone (4-Methyl-2-Pentanone)	NS	NS	5.11	5.11
Mathylovclobevane	NIC	NC	1 111	
Mathylene Chloride	500	0.05		
N-Xylene (1.2-Dimethylbenzene)		0.03 NC	0.5 0	0.37 1
		NO	1 11	
Tert Butyl Methyl Ethor	500		1 U	
	300	0.80		
	100	1.3		
Trans 1.2 Disblargethere	500	0.1	U.41 J	
	500	0.19	<u>1 U</u>	
	NS 000	NS o t7	<u>1 U</u>	10
	200	0.47	<u> </u>	1 U
	NS	NS	<u> </u>	1 U
Vinyl Chloride	13	0.02	1 U	1 U

#### Table 3 Queens Animal Shelter and Care Center 151 Woodward Avenue, Queens, NY

		AKRF Sample ID	EP-01_1_20200618	EP-02_1_20200618	EP-03_1_20200618	EP-04_1_20200616	EP-05_1_20200618	EP-06_1_20200618
	L	aboratory Sample ID	460-211428-1	460-211428-4	460-211428-9	460-211215-1	460-211428-2	460-211428-5
		Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/16/2020	6/18/2020	6/18/2020
		Dilution Factor	1 ma/ka	1 ma/ka	- ma/ka	1 ma/ka	ng/kg	1 ma/ka
Compound	NYSDEC CSCO		CONC Q					
1,2,4,5-Tetrachlorobenzene	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
1,4-Dioxane (P-Dioxane)	130	0.1	0.11 UJ	0.11 UJ	0.11 UJ	0.12 UJ	0.11 UJ	0.11 UJ
2,3,4,6-Tetrachlorophenol	NS	NS	0.36 UJ	0.36 UJ	0.38 U	0.39 U	0.35 UJ	0.37 UJ
2,4,5-Trichlorophenol	NS	NS	0.36 UJ	0.36 UJ	0.38 U	0.39 U	0.35 UJ	0.37 UJ
2,4,6-Trichlorophenol	NS	NS	0.15 UJ	0.14 UJ	0.15 U	0.16 U	0.14 UJ	0.15 UJ
2,4-Dichlorophenol	NS	NS	0.15 UJ	0.14 UJ	0.15 0	0.16 U	0.14 UJ	0.15 UJ
2,4-Dimethylphenol	NS NS	NS NS		0.028 J			0.35 UJ	
2.4-Dinitrophene	NS	NS	0.074 U	0.072 U	0.077 U	0.078 U	0.072 U	0.075 UJ
2,6-Dinitrotoluene	NS	NS	0.074 U	0.072 U	0.077 U	0.078 U	0.072 U	0.075 UJ
2-Chloronaphthalene	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.051 J
2-Chlorophenol	NS	NS	0.36 UJ	0.36 UJ	0.38 U	0.39 U	0.35 UJ	0.37 UJ
2-Methylnaphthalene	NS	NS	0.36 U	0.27 J	0.09 J	4 L	0.024 J	0.15 J
2-Methylphenol (O-Cresol)	500	0.33	0.36 UJ	0.36 UJ	0.38 U	0.39 U	0.35 UJ	0.37 UJ
2-Nitroaniline	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
2-Nitrophenol	NS NS	NS NS	0.36 UJ		0.38 0	0.39 0	0.35 UJ	0.37 UJ
3-Nitroaniline	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.13 03
4,6-Dinitro-2-Methylphenol	NS	NS	0.29 UJ	0.29 UJ	0.31 U	0.31 UJ	0.29 UJ	0.3 UJ
4-Bromophenyl Phenyl Ether	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
4-Chloro-3-Methylphenol	NS	NS	0.36 UJ	0.36 UJ	0.38 U	0.39 U	0.35 UJ	0.37 UJ
4-Chloroaniline	NS	NS	0.36 U	0.36 U	0.38 U	0.39 UJ	0.35 U	0.37 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
4-Methylphenol (P-Cresol)	500	0.33	0.36 UJ	0.058 J	0.033 J	0.39 U	0.35 UJ	0.029 J
4-Nitrophenol	NS NS	NS NS				0.39 03	0.35 0	0.37 05
Acenaphthene	500	98	0.36 U	0.094 J	0.38 U	0.39 UJ	0.35 U	0.37 U.I
Acenaphthylene	500	107	0.36 U	0.24 J	0.017 J	0.044 J	0.012 J	0.1 J
Acetophenone	NS	NS	0.36 UJ	0.36 UJ	0.035 J	0.39 UJ	0.35 UJ	0.056 J
Anthracene	500	1,000	0.36 U	0.78	0.072 J	0.096 J	0.35 U	0.061 J
Atrazine	NS	NS	0.15 U	0.14 U	0.15 U	0.16 U	0.14 U	0.15 UJ
Benzaldehyde	NS	NS	0.36 UJ	0.36 UJ	0.38 U	0.39 UJ	0.35 UJ	0.37 UJ
Benzo(a)Anthracene	5.6	1	0.042	4.2	0.4	0.18	0.16	0.22 L
Benzo(b)Fluoranthene	56	17	0.041	<u>4.8</u>	0.41	0.14	0.15	0.22 L
Benzo(g.h.i)Pervlene	500	1.000	0.032 J	2.5	0.3 J	0.076 J	0.2 0.096 J	0.15 J
Benzo(k)Fluoranthene	56	1.7	0.015 J	2.4	0.22	0.091	0.081	0.14 L
Benzyl Butyl Phthalate	NS	NS	0.18 J	0.28 J	0.38 U	0.39 U	0.35 U	0.37 UJ
Biphenyl (Diphenyl)	NS	NS	0.36 U	0.36 U	0.38 U	0.18 J	0.35 U	0.37 UJ
Bis(2-Chloroethoxy) Methane	NS	NS	0.36 UJ	0.36 UJ	0.38 U	0.39 UJ	0.35 UJ	0.37 UJ
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.036 UJ	0.036 UJ	0.038 U	0.039 UJ	0.035 UJ	0.037 UJ
Bis(2-Chioroisopropyi) Ether	NS NS	NS NS			0.38 0	0.39 0	0.35 0	0.37 UJ
Caprolactam	NS	NS	0.36 U	0.36 U	0.38 U	4.4 J 0.39 LI	0.14 5	0.21 5
Carbazole	NS	NS	0.36 U	0.21 J	0.033 J	0.39 U	0.014 J	0.022 J
Chrysene	56	1	0.043 J	4.4	0.45	0.24 J	0.16 J	0.27 J
Dibenz(a,h)Anthracene	0.56	1,000	0.036 U	0.71	0.075	0.028 J	0.028 J	0.035 J
Dibenzofuran	350	210	0.36 U	0.076 J	0.02 J	0.39 U	0.35 U	0.016 J
Diethyl Phthalate	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
Dimetnyi Phthalate	NS NC	NS NC	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
	NS NS	NS NS				0.064 5	0.35 U	0.37 05
Fluoranthene	500	1.000	0.063 J	7.1	0.63	0.4	0.24 J	0.44 L
Fluorene	500	386	0.36 U	0.23 J	0.03 J	0.21 J	0.35 U	0.031 J
Hexachlorobenzene	6	3.2	0.036 U	0.036 U	0.038 U	0.039 U	0.035 U	0.037 UJ
Hexachlorobutadiene	NS	NS	0.074 U	0.072 U	0.077 U	0.078 U	0.072 U	0.075 UJ
Hexachlorocyclopentadiene	NS	NS	0.36 U	0.36 U	0.38 U	0.39 UJ	0.35 U	0.37 UJ
	NS	NS	0.036 UJ	0.036 UJ	0.038 U	0.039 UJ	0.035 UJ	0.037 UJ
	5.6 NC	8.2 NC	0.034 J	2.8	0.29		0.1	0.15 L
Naphthalene	500	12	0.15 00	0.14 00	0.15 0	261	0.14 0J	0.15 05
Nitrobenzene	NS	NS	0.036 UJ	0.036 UJ	0.038 U	0.039 U	0.035 UJ	0.037 UJ
N-Nitrosodi-N-Propylamine	NS	NS	0.036 UJ	0.036 UJ	0.038 U	0.039 UJ	0.035 UJ	0.037 UJ
N-Nitrosodiphenylamine	NS	NS	0.36 U	0.36 U	0.38 U	0.39 U	0.35 U	0.37 UJ
Pentachlorophenol	6.7	0.8	0.29 UJ	0.29 UJ	0.31 U	0.31 UJ	0.29 UJ	0.3 UJ
Phenanthrene	500	1,000	0.04 J	3.5	0.43	0.74	0.16 J	0.33 J
Phenol	500	0.33	0.36 UJ	0.36 UJ	0.38 U	0.39 U	0.35 UJ	0.039 J
IF YIEIIE	000	1,000	U.U/IJ	0.1	U./D	0.02	0.∠0 J	U.40 L

#### Table 3Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NY

		AKRF Sample ID Laboratory Sample ID Date Sampled	EP-07_1_20200618 460-211428-7 6/18/2020	EP-08_1_20200618 460-211428-3 6/18/2020	EP-09_1_20200618 460-211428-6 6/18/2020	EP-10_1_20200618 460-211428-8 6/18/2020	EP-11_1_20200618 460-211428-10 6/18/2020	EP-12_1_20200612 460-210991-4 6/12/2020
		Dilution Factor	5	1	1	1	1	1
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCC							
1,2,4,5- l etrachiorobenzene	NS	NS 0.1	1.8 U	0.34 0	0.35 UJ	0.34 U	0.36 UJ	0.37 0
2.3.4.6 Tetrachlorophenol	130	0.1 NS		0.1 05	0.11 05	0.1 05	0.11 05	0.11 0
2.4.5-Trichlorophenol	NS	NS		0.34 U	0.35 U.I	0.34 U.I	0.36 U.I	0.37 U
2 4 6-Trichlorophenol	NS	NS	0.74 U.I	0.14 U	0.14 U.I	0 14 U.I	0.15 UJ	0.15 U
2.4-Dichlorophenol	NS	NS	0.74 UJ	0.14 U	0.14 UJ	0.14 UJ	0.15 UJ	0.15 U
2,4-Dimethylphenol	NS	NS	1.8 UJ	0.34 U	0.35 UJ	0.041 J	0.05 J	0.19 J
2,4-Dinitrophenol	NS	NS	1.5 UJ	0.27 UJ	0.28 UJ	0.27 UJ	0.29 UJ	0.3 U
2,4-Dinitrotoluene	NS	NS	0.37 U	0.069 U	0.072 UJ	0.069 U	0.073 UJ	0.076 U
2,6-Dinitrotoluene	NS	NS	0.37 U	0.069 U	0.072 UJ	0.069 U	0.073 UJ	0.076 U
2-Chloronaphthalene	NS	NS	1.8 U	0.34 U	0.03 J	0.34 U	0.36 UJ	0.37 U
2-Chlorophenol	NS	NS	1.8 UJ	0.34 U	0.35 UJ	0.34 UJ	0.36 UJ	0.37 U
2-Methylnaphthalene	NS	NS	0.37 J	0.028 J	0.05 J	0.13 J	0.096 J	0.61
2-Methylphenol (O-Cresol)	500	0.33	<u>1.8 UJ</u>	0.34 U	0.35 UJ	0.34 UJ	0.36 UJ	0.37 U
2-Nitroaniline	NS	NS	<u>1.8 U</u>	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.37 U
2-Nitrophenol	NS	NS	1.8 UJ	0.34 U	0.35 UJ	0.34 UJ	0.36 UJ	0.37 U
3,3-Dichlorobenzialne	NS NS	NS		0.14 UJ	0.14 UJ	0.14 0	0.15 UJ	0.15 U
4 6 Dipitro 2 Mothylphopol	NS NS	NS	1.8 0					0.37 0
4-Bromonhenyl Phenyl Ether	NIS	NS	1.3.00	0.27.03	0.25 03	0.34 11	0.29 00	0.3 0
4-Chloro-3-Methylphenol	NS	NS		0.34 U	0.35 03	0.34 U	0.36 U	0.37 U
4-Chloroaniline	NS	NS	18.U	0.34 U.I	0.35 U.I	0.34 U	0.36 U.I	0.37 U
4-Chlorophenyl Phenyl Ether	NS	NS	1.8 U	0.34 U	0.35 UJ	0.34 U	0.36 UJ	0.37 U
4-Methylphenol (P-Cresol)	500	0.33	1.8 UJ	0.34 U	0.35 UJ	0.06 J	0.082 J	0.13 J
4-Nitroaniline	NS	NS	1.8 U	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.37 U
4-Nitrophenol	NS	NS	3.7 UJ	0.69 UJ	0.72 UJ	0.69 UJ	0.73 UJ	0.76 U
Acenaphthene	500	98	1.9	0.34 UJ	0.35 UJ	0.03 J	0.42 L	0.21 J
Acenaphthylene	500	107	0.18 J	0.34 U	0.074 J	0.02 J	0.046 J	0.051 J
Acetophenone	NS	NS	0.36 J	0.34 UJ	0.35 UJ	0.34 UJ	0.36 UJ	0.37 U
Anthracene	500	1,000	5.6	0.34 U	0.038 J	0.081 J	1.2 L	0.27 J
Atrazine	NS	NS	0.74 U	0.14 U	0.14 UJ	0.14 U	0.15 UJ	0.15 U
	NS 5.0	NS	1.8 UJ	0.34 UJ	0.35 UJ	0.34 UJ	0.36 UJ	0.37 UJ
Benzo(a)Anthracene	5.6	22	16	0.061	0.13 L	0.47	4.1 L	0.78
Benzo(h)Fluoranthene	56	17	14	0.001	0.13 L	0.40	3.9 L	0.70
Benzo(g h i)Pervlene	500	1 000	61	0.055.1	0.086.1	0.31.1	21	0.36.1
Benzo(k)Fluoranthene	56	1.7	5.7	0.038	0.073 L	0.22	2.1 L	0.35
Benzyl Butyl Phthalate	NS	NS	0.76 J	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.14 J
Biphenyl (Diphenyl)	NS	NS	1.8 U	0.34 U	0.35 UJ	0.34 U	0.36 UJ	0.041 J
Bis(2-Chloroethoxy) Methane	NS	NS	1.8 UJ	0.34 UJ	0.35 UJ	0.34 UJ	0.36 UJ	0.37 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.18 UJ	0.034 UJ	0.035 UJ	0.034 UJ	0.036 UJ	0.037 U
Bis(2-Chloroisopropyl) Ether	NS	NS	1.8 U	0.34 U	0.35 UJ	0.34 U	0.36 UJ	0.37 U
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.96 J	0.073 J	0.11 J	1 J	0.3 J	3.7
Caprolactam	NS	NS	1.8 U	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.37 U
	NS	NS	0.78 J	0.34 U	0.014 J	0.029 J	0.25 J	0.059 J
Chrysene	56	1	16	0.072 J	0.14 J	0.51	3.9 L	0.94
Dibenzofuran	0.56	1,000	<u> </u>	0.034 UJ	0.025 J	0.024	U.6/ L	
Dipenzolulari Diethyl Phthalate		210 NS	1811	0.34 U	0.35 03	0.024 3	0.19 J	0.002 J
Directly Philalate	NS	NS	1.8 U	0.34 U	0.35 U.I	0.34	0.058.5	0.37 U
Di-N-Butyl Phthalate	NS	NS	1.8 U	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.086 J
Di-N-Octylphthalate	NS	NS	1.8 U	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.37 U
Fluoranthene	500	1,000	34	0.1 J	0.25 J	0.72	7.4 L	1.5
Fluorene	500	386	2.3	0.34 U	0.019 J	0.042 J	0.4 L	0.18 J
Hexachlorobenzene	6	3.2	0.18 U	0.034 U	0.035 UJ	0.034 U	0.036 UJ	0.037 U
Hexachlorobutadiene	NS	NS	0.37 U	0.069 U	0.072 UJ	0.069 U	0.073 UJ	0.076 U
Hexachlorocyclopentadiene	NS	NS	1.8 U	0.34 UJ	0.35 UJ	0.34 U	0.36 UJ	0.37 U
Hexachloroethane	NS	NS	0.18 UJ	0.034 UJ	0.035 UJ	0.034 UJ	0.036 UJ	0.037 U
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	7	0.054	0.089 L	0.31	2.4 L	0.34
	NS	NS	0.74 UJ	0.14 UJ	0.14 UJ	0.14 UJ	0.15 UJ	0.15 U
Naphthalene	500	12	0.32 J	0.03 J	0.18 J	0.15 J	0.14 J	0.66
N Nitrosodi N Propulamina	NS NC	NS NC	0.18 UJ	0.034 U	0.035 UJ	0.034 UJ	0.036 UJ	0.037 U
N. Nitrosodinhenvlamina				0.034 UJ	0.035 UJ	0.034 UJ		
Pentachloronhenol	67		1.0 U	0.34 0	0.35 UJ	0.34 0	0.30 03	
Phenanthrene	500	1,000	32	0.059.1	0.19.1	0.49	4 8 1	19
Phenol	500	0.33	1.8 UJ	0.34 U	0.35 UJ	0.34 UJ	0.36 UJ	0.37 U
Pyrene	500	1,000	35	0.12 J	0.28 J	0.94	7.4 L	2.2

#### Table 3 Queens Animal Shelter and Care Center 151 Woodward Avenue, Queens, NY

		AKRF Sample ID	EP-13 1 20200612	EP-14 1 20200501	EP-X04 1 20200501	EP-15 1 20200501	EP-16 1 20200501	EP-17 1 20200612
		Laboratory Sample ID	460-210991-5	460-208010-1	460-208010-7	460-208010-2	460-208010-3	460-210991-1
		Date Sampled	6/12/2020	5/01/2020	5/01/2020	5/01/2020	5/01/2020	6/12/2020
		Dilution Factor	1	1	1	1	1	1
Common and			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSC							
1,2,4,5-1etrachiorobenzene 1 4-Dioxane (P-Dioxane)	130	0.1	0.4 05	0.38 0	0.38 0	0.39 0	0.37 0	0.36 03
2 3 4 6-Tetrachlorophenol	NS	NS	0.4 U.I	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
2,4,5-Trichlorophenol	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
2,4,6-Trichlorophenol	NS	NS	0.16 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.14 U
2,4-Dichlorophenol	NS	NS	0.16 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.14 U
2,4-Dimethylphenol	NS	NS	0.092 J	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
2,4-Dinitrophenol	NS	NS	0.32 UJ	0.31 UJ	0.31 UJ	0.31 U	0.3 U	0.29 U
2,4-Dinitrotoluene	NS	NS	0.08 UJ			0.079 U	0.075 U	0.072 UJ
2,0-Diriti otoluene 2-Chloronaphthalene	NS	NS	0.08 05		0.38	0.079 0	0.075 0	0.072 03
2-Chlorophenol	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
2-Methylnaphthalene	NS	NS	0.48 J	0.012 J	0.38 U	0.39 U	0.37 U	0.075 J
2-Methylphenol (O-Cresol)	500	0.33	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
2-Nitroaniline	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
2-Nitrophenol	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
3,3'-Dichlorobenzidine	NS	NS	0.16 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.14 UJ
3-INITROANIIINE	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
4,0-Difficult-2-iviethylphenol 4-Bromonhenyl Phenyl Ether			0.32 UJ		0.31 UJ 0.38 II	0.31 0	0.3 0	0.29 UJ
4-Chloro-3-Methylphenol	NS	NS	0.4 11.1	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
4-Chloroaniline	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
4-Methylphenol (P-Cresol)	500	0.33	0.069 J	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
4-Nitroaniline	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
4-Nitrophenol	NS	NS	0.8 UJ	0.77 U	0.77 U	0.79 U	0.75 U	0.72 U
Acenaphthene	500	98	0.1 J	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
	500 NS	107 NS	0.113			0.39 0	0.37 0	0.018 J
Anthracene	500	1 000	0.4 03	0.38 U	0.38 U	0.39 U	0.37 U	0.028.1
Atrazine	NS	NS	0.16 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.14 UJ
Benzaldehyde	NS	NS	0.4 UJ	0.38 UJ	0.38 UJ	0.39 UJ	0.37 UJ	0.36 UJ
Benzo(a)Anthracene	5.6	1	0.74 J	0.066 J	0.036 J	0.039 UJ	0.02 J	0.19 L
Benzo(a)Pyrene	1	22	0.75 J	0.061 J	0.024 J	0.039 UJ	0.015 J	0.23 L
Benzo(b)Fluoranthene	5.6	1.7	0.98 J	0.082 J	0.032 J	0.039 UJ	0.017 J	0.3 L
Benzo(g,n,i)Perylene	500	1,000	0.29 J	0.037 J	0.018	0.39 U		0.13 J
Benzyl Butyl Phthalate	50 NS	I.7 NS	0.4111	0.38 U	0.38 U	0.059 0	0.037 0	0.12 L
Biphenyl (Diphenyl)	NS	NS	0.039 J	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Bis(2-Chloroethoxy) Methane	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.04 UJ	0.038 U	0.038 U	0.039 U	0.037 U	0.036 UJ
Bis(2-Chloroisopropyl) Ether	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.89 J	0.035 J	0.38 U	0.39 U	0.37 U	0.58 L
Caprolactam	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
	NS 56	N5 1	0.12 J		0.020	0.39 U	0.37 U	0.36 UJ
Dibenz(a.h)Anthracene	0.56	1.000	0.082 .1	0.038 U	0.029 J	0.039 U	0.037 U	0.033 J
Dibenzofuran	350	210	0.087 J	0.38 U	0.38 U	0.39 U	0.37 U	0.0084 J
Diethyl Phthalate	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Dimethyl Phthalate	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Di-N-Butyl Phthalate	NS	NS	0.086 J	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Di-N-Octylphthalate	NS	NS	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 UJ
Fluoranthene	500	1,000	1.4 J	0.12 J 0.38 U	0.053 J	0.023 J	0.023 J	0.29 J
Hexachlorobenzene	500	3.2	0.18.5	0.038 U	0.38 U	0.39 0	0.37 0	0.014 3
Hexachlorobutadiene	NS	NS	0.08 UJ	0.077 U	0.077 U	0.079 U	0.075 U	0.072 UJ
Hexachlorocyclopentadiene	NS	NS	0.4 UJ	0.38 UJ	0.38 UJ	0.39 U	0.37 U	0.36 UJ
Hexachloroethane	NS	NS	0.04 UJ	0.038 U	0.038 U	0.039 U	0.037 U	0.036 UJ
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	0.32 J	0.065 J	0.034 J	0.039 UJ	0.037 UJ	0.13 L
Isophorone	NS	NS	0.16 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.14 UJ
Naphthalene	500	12	0.47 J	0.015 J	0.38 U	0.39 U	0.37 U	0.073 J
Nitropenzene	NS NC	NS NC	0.04 UJ	0.038 U	0.038 U	0.039 U	0.037 U	0.036 UJ
N-Nitrosodinhenvlamine			0.04 UJ	0.030 U 0.38 II	0.030 0	0.039 0	0.037 0	0.030 00
Pentachlorophenol	6.7	0.8	0.32 UJ	0.31 U	0.31 U	0.31 U	0.3 U	0.29 UJ
Phenanthrene	500	1,000	1.3 J	0.076 J	0.022 J	0.022 J	0.013 J	0.14 J
Phenol	500	0.33	0.4 UJ	0.38 U	0.38 U	0.39 U	0.37 U	0.36 U
Pyrene	500	1,000	1.4 J	0.12 J	0.054 J	0.022 J	0.025 J	0.35 J

#### Table 3Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NY

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		AKRF Sample ID	EP-18_1_20200612	EP-19_1_20200612	EP-20_1_20200217	EP-21_1_20200501	EP-22_1_20200501	EP-23_1_20200226
		Laboratory Sample ID	460-210991-2	460-210991-3	460-203168-11	460-208010-4	460-208010-5	460-203752-9
		Date Sampled	6/12/2020	6/12/2020	2/17/2020	5/01/2020	5/01/2020	2/26/2020
		Dilution Factor	1	1	1	1	1	1
		Unit	ma/ka	mg/kg	mg/kg	ma/ka	ma/ka	ma/ka
Compound	NYSDEC CS	CO NYSDEC PGWSCO	CONCIQ	CONCIQ	CONCIQ	CONCIQ	CONC Q	CONCIQ
1,2,4,5-Tetrachlorobenzene	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
1,4-Dioxane (P-Dioxane)	130	0.1	0.11 UJ	0.11 U				
2.3.4.6-Tetrachlorophenol	NS	NS	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
2 4 5-Trichlorophenol	NS	NS	0.38 []	0.36 U.I	0.36 U	0.36 U	0.37 U	0.36 U
2.4.6 Trichlorophenol	NS	NS	0.15	0.15	0.15	0.15	0.15	
2,4,0- menorphenol	NO	NG	0.15 0	0.15 05	0.15 0	0.15 0	0.15 0	0.14 U
	INS	INS	0.15 0	0.15 UJ	0.15 0	0.15 0	0.15 0	0.14 0
2,4-Dimethylphenol	NS	NS	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
2,4-Dinitrophenol	NS	NS	0.3 U	0.29 UJ	0.29 U	0.29 U	0.3 U	0.29 U
2,4-Dinitrotoluene	NS	NS	0.077 UJ	0.074 UJ	0.074 UJ	0.074 U	0.075 U	0.073 U
2.6-Dinitrotoluene	NS	NS	0.077 UJ	0.074 UJ	0.074 UJ	0.074 U	0.075 U	0.073 U
2-Chloronaphthalene	NS	NS	0.38 U.I	0.36 [].]	0.36.111	0.36 []	0.37 []	0.36.11
2 Chlorophonol	NS	NS	0.38 11	0.36 111	0.36 U	0.36 U	0.37 U	0.36 U
	113	N3	0.36 0	0.36 03	0.36 0	0.36 0	0.37 0	0.36 0
2-Methylnaphthalene	NS	NS	0.38 UJ	0.02 J	0.36 UJ	0.36 U	0.37 0	0.36 U
2-Methylphenol (O-Cresol)	500	0.33	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
2-Nitroaniline	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
2-Nitrophenol	NS	NS	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
3.3'-Dichlorobenzidine	NS	NS	0.15 UJ	0.15 UJ	0.15 UJ	0.15 U	0.15 U	0.14 U
3-Nitroaniline	NS	NS	0.38 [].]	0.36 U.I	0.36 111	0.36 []	0.37 []	0.36 U
4.6-Dinitro-2-Methylphenol	NC	NIC	03111	0.20 111	0.20 11	0.20 11	0.211	0.20 11
	NO						0.3 0	
	NS	NS	0.38 UJ	0.36 UJ	U.36 UJ	0.36 U	0.37 U	U.36 U
4-Chloro-3-Methylphenol	NS	NS	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
4-Chloroaniline	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
4-Chlorophenyl Phenyl Ether	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
4-Methylphenol (P-Cresol)	500	0.33	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
4-Nitroaniline	NS	NS	0.38 U.I	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
1-Nitrophenol	NS	NS	0.77 []	0.74 111		0.74 11	0.75.11	0.73
	500	115	0.28 111	0.26 111	0.26 111	0.74 0	0.73 0	0.75 0
Acenaphthene	500	98	0.38 UJ	0.36 03	0.36 UJ	0.36 0	0.37 0	0.36 0
Acenaphthylene	500	107	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Acetophenone	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Anthracene	500	1,000	0.38 UJ	0.028 J	0.36 UJ	0.36 U	0.37 U	0.36 U
Atrazine	NS	NS	0.15 UJ	0.15 UJ	0.15 UJ	0.15 U	0.15 U	0.14 U
Benzaldehvde	NS	NS	0.38 U.I	0.36 U.I	0.36 UJ	0.36 U.I	0.37 U.I	0.36 U
Benzo(a)Anthracene	5.6	1		0.094 1	0.068		0.037.111	0.024 1
	5.0	1	0.047 L	0.094 3	0.000 L	0.016 3	0.037 03	0.024 3
Benzo(a)Pyrene	1	22	0.047 L	0.089 J	0.053 J	0.036 0J	0.037 0J	0.015 J
Benzo(b)Fluoranthene	5.6	1.7	0.058 L	0.11 J	0.067 J	0.036 UJ	0.037 UJ	0.021 J
Benzo(g,h,i)Perylene	500	1,000	0.031 J	0.061 J	0.037 J	0.36 U	0.37 U	0.36 U
Benzo(k)Fluoranthene	56	1.7	0.018 J	0.039 J	0.025 J	0.036 U	0.037 U	0.036 U
Benzyl Butyl Phthalate	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Biphenyl (Diphenyl)	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.38 111	0.36 111	0.36	0.36 U	0.37 11	0.36 U
Bis(2-Chloroethyl) Ethor. (2 Chloroethyl Ethor)	NO	NS	0.038 111	0.036 UU	0.036 111	0.036 U	0.037 U	0.036 U
Bis(2-Chioroethyr) Ether (2-Chioroethyr Ether)	N5	N5	0.038 0J	0.036 0.0	0.036 0J	0.036 0	0.037 0	0.036 0
Bis(2-Chloroisopropyl) Ether	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.053 J	0.066 J	0.13 J	0.36 U	0.37 U	0.36 U
Caprolactam	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Carbazole	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Chrvsene	56	1	0.049 J	0.093 J	0.066 J	0.012 J	0.37 U	0.018 J
Dibenz(a h)Anthracene	0.56	1 000	0.038.111	0.036.111	0.036.111	0.036.11	0.037.11	0.036.11
Dibenzofuran	250	240	0.000 00	0.000 00	0.000.00	0.000 0	0.37 11	0.000 0
	330	210						
	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Dimethyl Phthalate	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Di-N-Butyl Phthalate	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Di-N-Octylphthalate	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Fluoranthene	500	1.000	0.069 J	0.17 J	0.11 J	0.021 J	0.37 U	0.027 J
Eluorene	500	386	0.38 U.I	0.013.1	0.36 U.I	0.36 U	0.37 U	0.36 U
Hexachlorobenzene	6	2.0	0.038 111	0.036.111	0.036 111	0.036.11	0.037.11	0.036 U
		0.2 NC	0.037 111	0.034 111		0.030 0	0.037 0	0.030 0
	NS NS	INS	0.077 UJ	0.074 UJ	0.074 UJ	0.074 0	0.075 0	0.073 0
Hexachlorocyclopentadiene	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Hexachloroethane	NS	NS	0.038 UJ	0.036 UJ	0.036 UJ	0.036 U	0.037 U	0.036 U
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	0.034 J	0.064 J	0.038 J	0.036 UJ	0.037 UJ	0.036 U
Isophorone	NS	NS	0.15 UJ	0.15 UJ	0.15 UJ	0.15 U	0.15 U	0.14 U
Naphthalene	500	12	0.017.1	0.035	0.36 U.I	0.36 U	0.37 []	0.36 U
Nitrobenzene	NS	NS	0.038.111	0.036.111	0.036.111	0.036.11	0.037.11	0.036 U
N Nitrosodi N Propulamina	Ne		0.000 00	0.000 00			0.007 U	0.000 0
	INS NG	INS NO	0.038 UJ	0.030 UJ	0.030 UJ		0.037 0	
	NS	NS	0.38 UJ	0.36 UJ	0.36 UJ	0.36 U	0.37 U	0.36 U
Pentachlorophenol	6.7	0.8	0.3 UJ	0.29 UJ	0.29 U	0.29 U	0.3 U	0.29 U
Phenanthrene	500	1,000	0.045 J	0.15 J	0.077 J	0.015 J	0.37 U	0.029 J
Phenol	500	0.33	0.38 U	0.36 UJ	0.36 U	0.36 U	0.37 U	0.36 U
Pvrene	500	1 000	0.085	0.18.1	0 13 .	0.02.1	0.37 []	0.03.1
		.,						

#### Table 3 Queens Animal Shelter and Care Center 151 Woodward Avenue, Queens, NY

		AKRF Sample ID	EP-24_1_20200226	EP-X3_1_20200226	EP-25_1_20200217	EP-26_1_20200217	EP-27_1_20200217	EP-28_1_20200217
	L	aboratory Sample ID	460-203752-7	460-203752-8	460-203168-10	460-203168-13	460-203168-14	460-203168-5
		Date Sampled Dilution Factor	2/26/2020	2/26/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
1,4-Dioxane (P-Dioxane)	130 NS	0.1	0.11 U	0.11 U	0.11 UJ	0.11 UJ	0.12 UJ	0.11 UJ
2 4 5-Trichlorophenol	NS	NS	0.37 U	0.37 U	0.37 U	0.36 U	0.38 U	0.36 UJ
2,4,6-Trichlorophenol	NS	NS	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.14 UJ
2,4-Dichlorophenol	NS	NS	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.14 UJ
2,4-Dimethylphenol	NS	NS	0.37 U	0.37 U	0.37 U	0.36 U	0.18 J	0.36 UJ
2,4-Dinitrophenol	NS	NS	0.3 U	0.3 U	0.3 U	0.29 U	0.31 U	0.29 UJ
2,4-Dinitrotoluene	NS	NS	0.076 U	0.075 U	0.076 UJ	0.074 U	0.078 UJ	0.073 UJ
2,0-Dinitiolouene 2-Chloronaphthalene	NS	NS	0.078 0	0.075 0		0.074 0		0.073 05
2-Chlorophenol	NS	NS	0.37 U	0.37 U	0.37 U	0.36 U	0.38 U	0.36 UJ
2-Methylnaphthalene	NS	NS	0.37 U	0.37 U	0.016 J	0.012 J	0.043 J	0.36 UJ
2-Methylphenol (O-Cresol)	500	0.33	0.37 U	0.37 U	0.37 U	0.36 U	0.018 J	0.36 UJ
2-Nitroaniline	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
2-Nitrophenol	NS	NS	0.37 U	0.37 U	0.37 U	0.36 U	0.38 U	0.36 UJ
3-Nitroaniline	NS NS	NS NS	0.15 0	0.15 0	0.15 UJ	0.15 UJ	0.15 UJ 0.38 U.I	0.14 00
4,6-Dinitro-2-Methylphenol	NS	NS	0.3 U	0.3 U	0.3 U	0.29 U	0.31 U	0.29 UJ
4-Bromophenyl Phenyl Ether	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
4-Chloro-3-Methylphenol	NS	NS	0.37 U	0.37 U	0.37 U	0.36 U	0.38 U	0.36 UJ
4-Chloroaniline	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
4-Methylphenol (P-Cresol)	500 NS	0.33 NS				0.36 U	0.35 J	
4-Nitrophenol	NS	NS	0.76 U	0.75 U	0.76 U	0.30 C	0.78 U	0.73 UJ
Acenaphthene	500	98	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Acenaphthylene	500	107	0.37 U	0.37 U	0.37 UJ	0.36 U	0.013 J	0.36 UJ
Acetophenone	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Anthracene	500	1,000	0.37 U	0.37 U	0.37 UJ	0.36 U	0.038 J	0.36 UJ
Rinzine Benzaldehyde	NS	NS	0.15 0	0.15 0	0.15 05	0.15 0		0.14 05
Benzo(a)Anthracene	5.6	1	0.037 U	0.037 U	0.06 L	0.043	0.13 L	0.036 UJ
Benzo(a)Pyrene	1	22	0.037 U	0.037 U	0.044 J	0.037 J	0.092 J	0.036 UJ
Benzo(b)Fluoranthene	5.6	1.7	0.037 U	0.037 U	0.064 J	0.048 J	0.15 J	0.011 J
Benzo(g,h,i)Perylene	500	1,000	0.37 U	0.37 U	0.031 J	0.027 J	0.068 J	0.36 UJ
Benzo(k)Fluoranthene	56 NS	1./	0.037 U	0.037 U	0.024 J	0.017 J	0.052 L	0.036 UJ
Biphenyl (Diphenyl)	NS	NS	0.37 0	0.37 U	0.37 03	0.36 U	0.042 3	0.36 U.I
Bis(2-Chloroethoxy) Methane	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.037 U	0.037 U	0.037 UJ	0.036 U	0.038 UJ	0.036 UJ
Bis(2-Chloroisopropyl) Ether	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.37 U	0.37 U	0.18 J	0.13 J	0.15 J	0.065 J
Caprolactam	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Chrysene	56	1	0.37 U	0.37 U	0.37 03	0.30 0	0.015 J	0.36 UJ
Dibenz(a,h)Anthracene	0.56	1,000	0.037 U	0.037 U	0.037 UJ	0.036 U	0.038 UJ	0.036 UJ
Dibenzofuran	350	210	0.37 U	0.37 U	0.37 UJ	0.36 U	0.021 J	0.36 UJ
Diethyl Phthalate	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Dimethyl Phthalate	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Di-N-Butyl Phthalate	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Fluoranthene	500	1 000	0.37 0	0.37 0	0.089.1	0.058 .1	0.38 03	
Fluorene	500	386	0.37 U	0.37 U	0.37 UJ	0.36 U	0.029 J	0.36 UJ
Hexachlorobenzene	6	3.2	0.037 U	0.037 U	0.037 UJ	0.036 U	0.038 UJ	0.036 UJ
Hexachlorobutadiene	NS	NS	0.076 U	0.075 U	0.076 UJ	0.074 U	0.078 UJ	0.073 UJ
Hexachlorocyclopentadiene	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Hexachloroethane	NS	NS	0.037 U	0.037 U	0.037 UJ	0.036 U	0.038 UJ	0.036 UJ
Indeno(1,2,3-0,0)Pyrene	5.6 NS	ö.2 NIS	0.037 0	0.037 0	0.037 J 0.15 III	0.029 J 0.15 II	0.07 I J 0.15 I I I	0.030 UJ 0.14 III
Naphthalene	500	12	0.13 U	0.13 U	0.012 J	0.0099 J	0.15 UJ	0.36 UJ
Nitrobenzene	NS	NS	0.037 U	0.037 U	0.037 UJ	0.036 U	0.038 UJ	0.036 UJ
N-Nitrosodi-N-Propylamine	NS	NS	0.037 U	0.037 U	0.037 UJ	0.036 U	0.038 UJ	0.036 UJ
N-Nitrosodiphenylamine	NS	NS	0.37 U	0.37 U	0.37 UJ	0.36 U	0.38 UJ	0.36 UJ
Pentachlorophenol	6.7	0.8	0.3 U	0.3 U	0.3 U	0.29 U	0.31 U	0.29 UJ
Phenol	500	1,000	0.37 U	0.37 U	0.05/ J	0.035 J	0.17 J	0.36 UJ
Pyrene	500	1,000	0.37 U	0.37 U	0.099 J	0.073 J	0.30 U	0.022 J

#### Table 3Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NY

		AKRF Sample ID Laboratory Sample ID	EP-29_1_20200217 460-203168-8	EP-30_1_20200217 460-203168-9	EP-31_1_20200217 460-203168-12	EP-32_1_20200217 460-203168-4	EP-X2_1_20200217 460-203168-6	EP-33_1_20200217 460-203168-3
		Date Sampled Dilution Factor	2/17/2020 1	2/17/2020 1	2/17/2020 1	2/17/2020 1	2/17/2020 1	2/17/2020 1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CS	CO NYSDEC PGWSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
1,4-Dioxane (P-Dioxane)	130	0.1	0.12 UJ	0.12 UJ	0.12 UJ	0.11 UJ	0.11 UJ	0.11 UJ
2,3,4,6- I etrachlorophenol	NS	NS	0.39 U	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
2,4,5-1 richlorophenol	NS	NS	0.39 0	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
2,4,6-Trichlorophenol	NS NS	NS NS	0.16 U	0.16 U	0.15 U	0.15 0	0.14 UJ	0.15 UJ
2.4-Dictionophenol	NS	NS	0.10 0	0.10 0	0.15 0	0.13 0	0.14 03	0.15 05
2.4-Dinietrophenol	NS	NS	0.32	0.32 []	0.31	0.311	0.29 111	0.3111
2 4-Dinitrotoluene	NS	NS	0.079 [].1	0.08 U.I	0.078 111	0.074   ]	0.072 111	0.075 U.I
2.6-Dinitrotoluene	NS	NS	0.079 UJ	0.08 UJ	0.078 UJ	0.074 U	0.072 UJ	0.075 UJ
2-Chloronaphthalene	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
2-Chlorophenol	NS	NS	0.39 U	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
2-Methylnaphthalene	NS	NS	0.028 J	0.43	0.025 J	0.086 J	0.36 UJ	0.37 UJ
2-Methylphenol (O-Cresol)	500	0.33	0.39 U	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
2-Nitroaniline	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
2-Nitrophenol	NS	NS	0.39 U	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
3,3'-Dichlorobenzidine	NS	NS	0.16 UJ	0.16 UJ	0.15 UJ	0.15 UJ	0.14 UJ	0.15 UJ
3-Nitroaniline	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
4,6-Dinitro-2-Methylphenol	NS	NS	0.32 U	0.32 U	0.31 U	0.3 U	0.29 UJ	0.3 UJ
4-Bromophenyl Phenyl Ether	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
4-Chloro-3-Wethylphenol	NS NC	NS	0.39 U	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
4-Chlorophanyl Phanyl Ethor	NS NS	NS NS	0.39 0	0.39 0	0.38 UJ	0.37 0	0.36 UJ	0.37 UJ
4-Chlorophenyl Phenyl Ether	500	0.22			0.38 03	0.37 0	0.36 UJ	0.37 UJ
4-Methyphenor (F-Cresor)		0.33 NS	0.39 U	0.39 0	0.38 U	0.37 0	0.36 U	0.37 03
4-Nitrophenol	NS	NS	0.79 []	0.8 U	0.38 65	0.37 0	0.72 11.1	0.57 03
Acenaphthene	500	98	0.39 UJ	0.39 UJ	0.066 J	0.031 J	0.36 UJ	0.37 UJ
Acenaphthylene	500	107	0.39 UJ	0.014 J	0.03 J	0.016 J	0.36 UJ	0.37 UJ
Acetophenone	NS	NS	0.39 U	0.39 U	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Anthracene	500	1,000	0.031 J	0.04 J	0.15 J	0.035 J	0.36 UJ	0.37 UJ
Atrazine	NS	NS	0.16 UJ	0.16 UJ	0.15 UJ	0.15 U	0.14 UJ	0.15 UJ
Benzaldehyde	NS	NS	0.39 U	0.39 U	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Benzo(a)Anthracene	5.6	1	0.16	0.14	0.57 L	0.11	0.016 J	0.037 UJ
Benzo(a)Pyrene	1	22	0.14 J	0.089 J	0.51 J	0.091 J	0.036 UJ	0.037 UJ
Benzo(b)Fluoranthene	5.6	1.7	0.17 J	0.12 J	0.6 J	0.12 J	0.0093 J	0.037 UJ
Benzo(g,h,i)Perylene	500	1,000	0.095 J	0.051 J	0.33 J	0.062 J	0.36 UJ	0.37 UJ
Benzo(k)Fluoranthene	56	1.7	0.057	0.054	0.21 L	0.045	0.036 UJ	0.037 UJ
Benzyl Butyl Phthalate	NS	NS	0.39 U	0.39 U	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Bipnenyi (Dipnenyi) Bis(2, Chloroothovy) Mothano	NS NS	NS NS	0.39 UJ	0.39 UJ	0.38 UJ		0.36 UJ	0.37 UJ
Bis(2 Chloroethyl) Ether (2 Chloroethyl Ether)	NS NS	NS NS						
Bis(2-Chloroisopropyl) Ether	NS	NS	0.39 []	0.039 U	0.38 111	0.37 U	0.36 111	0.037 111
Bis(2-Ethylbexyl) Phthalate	NS	NS	0.35 .1	0.059 .1	0.38 U.I	0.94 .1		0.11 .
Caprolactam	NS	NS	0.39 U	0.39 U	0.071 J	0.37 U	0.36 UJ	0.37 UJ
Carbazole	NS	NS	0.016 J	0.39 UJ	0.062 J	0.37 U	0.36 UJ	0.37 UJ
Chrysene	56	1	0.2 J	0.13 J	0.66 L	0.11 J	0.0085 J	0.37 UJ
Dibenz(a,h)Anthracene	0.56	1,000	0.039 U	0.039 U	0.075 L	0.037 U	0.036 UJ	0.037 UJ
Dibenzofuran	350	210	0.39 UJ	0.39 UJ	0.037 J	0.37 U	0.36 UJ	0.37 UJ
Diethyl Phthalate	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Dimethyl Phthalate	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
DI-N-Butyl Phthalate	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Di-N-Octylphthalate	NS 500	NS 1.000	0.39 U	0.39 U	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Fluoranthene	500	1,000	0.29 J	0.29 J	0.97 L	0.18 J	0.015 J	0.37 UJ
Hexachlorobenzene	500	300	0.02 5		0.094 5	0.062 5		0.37 03
Hexachlorobutadiene	N.S.	J.Z NS	0.039.03	0.039.03	0.030.03	0.037 0	0.030 03	0.075 111
Hexachlorocyclopentadiene	NS	NS	0.39 11.1	0.39 11.1	0.38 11.1	0.37 11	0.36 11.1	0.37 11.1
Hexachloroethane	NS	NS	0.039 U	0.039 U	0.038 UJ	0.037 U	0.036 UJ	0.037 UJ
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	0.089 J	0.064 J	0.33 J	0.064 J	0.036 UJ	0.037 UJ
Isophorone	NS	NS	0.16 U	0.16 U	0.15 UJ	0.15 U	0.14 UJ	0.15 UJ
Naphthalene	500	12	0.022 J	0.26 J	0.045 J	0.17 J	0.36 UJ	0.37 UJ
Nitrobenzene	NS	NS	0.039 U	0.039 U	0.038 UJ	0.037 U	0.036 UJ	0.037 UJ
N-Nitrosodi-N-Propylamine	NS	NS	0.039 U	0.039 U	0.038 UJ	0.037 U	0.036 UJ	0.037 UJ
N-Nitrosodiphenylamine	NS	NS	0.39 UJ	0.39 UJ	0.38 UJ	0.37 U	0.36 UJ	0.37 UJ
Pentachlorophenol	6.7	0.8	0.32 U	0.32 U	0.31 U	0.3 U	0.29 UJ	0.3 UJ
Phenanthrene	500	1,000	0.3 J	0.18 J	0.94 L	0.14 J	0.01 J	0.37 UJ
Phenol	500	0.33	0.39 U	0.39 U	0.38 U	0.37 U	0.36 UJ	0.37 UJ
ryiene	500	1,000	0.41	0.27 J	1.1 L	0.21 J	0.019 J	0.027 J

#### Table 3 Queens Animal Shelter and Care Center 151 Woodward Avenue, Queens, NY

		AKRF Sample ID	EP-34 1 20200217	EP-35 1 20200203	FP-36 1 20200204	EP-37 1 20200204	FP-38 1 20200204	EP-39 1 20200204
		Laboratory Sample ID	460-203168-7	460-202180-7	460-202292-7	460-202292-8	460-202292-9	460-202292-10
		Date Sampled	2/17/2020	2/03/2020	2/04/2020	2/04/2020	2/04/2020	2/04/2020
		Dilution Eactor	1	1	1	1	1	1
		Dilution Factor	l ma/ka	n ma/ka	n ma/ka	n mg/kg	n ma/ka	n ma/ka
Commound								
	NTSDEC CSC	CO NTSDEC PGWSCO						
1,2,4,5- l etrachlorobenzene	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 0	0.37 UJ
1,4-Dioxane (P-Dioxane)	130	0.1	0.12 UJ	0.12 UI	0.11 UJ	0.11 UJ	0.11 UJ	0.11 UJ
2,3,4,6-1 etrachlorophenol	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2,4,5-1 richlorophenol	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2,4,6-Trichlorophenol	NS	NS	0.16 U	0.15 U	0.15 UJ	0.15 U	0.15 U	0.15 UJ
2,4-Dichlorophenol	NS	NS	0.16 U	0.15 U	0.15 UJ	0.15 U	0.15 U	0.15 UJ
2,4-Dimethylphenol	NS	NS	0.4 U	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2,4-Dinitrophenol	NS	NS	0.32 U	0.31 UT	0.29 UJ	0.29 U	0.3 U	0.3 UJ
2,4-Dinitrotoluene	NS	NS	0.08 UJ	0.077 U	0.074 UJ	0.074 U	0.074 U	0.076 UJ
2,6-Dinitrotoluene	NS	NS	0.08 UJ	0.077 U	0.074 UJ	0.074 U	0.074 U	0.076 UJ
2-Chloronaphthalene	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2-Chlorophenol	NS	NS	0.4 U	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2-Methylnaphthalene	NS	NS	0.4 UJ	0.38 U	0.017 J	0.022 J	0.42	0.015 J
2-Methylphenol (O-Cresol)	500	0.33	0.4 U	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2-Nitroaniline	NS	NS	0.4 UJ	0.38 UT	0.36 UJ	0.36 U	0.37 U	0.37 UJ
2-Nitrophenol	NS	NS	0.4 U	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
3,3'-Dichlorobenzidine	NS	NS	0.16 UJ	0.15 UT	0.15 UJ	0.15 U	0.15 U	0.15 UJ
3-Nitroaniline	NS	NS	0.4 UJ	0.38 UT	0.36 UJ	0.36 U	0.37 U	0.37 UJ
4,6-Dinitro-2-Methylphenol	NS	NS	0.32 U	0.31 UT	0.29 UJ	0.29 U	0.3 U	0.3 UJ
4-Bromophenyl Phenyl Ether	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
4-Chloro-3-Methylphenol	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
4-Chloroaniline	NS	NS	0.4 U	0.38 U	0.36 UJ	0.36 UJ	0.37 UJ	0.37 UJ
4-Chlorophenyl Phenyl Ether	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
4-Methylphenol (P-Cresol)	500	0.33	0.4 U	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
4-Nitroaniline	NS	NS	0.4 U.J	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 U.I
4-Nitrophenol	NS	NS	0.8 U	0.77 U	0.74 U.I	0.74 U	0.74 U	0.76 U.I
Acenaphthene	500	98	0.4 [].]	0.38 U	0.36 U.I	0.36 U	0.37 U	0.37 11.1
Acenaphthylene	500	107	0.4 111	0.38 []	0.36 UU	0.36 U	0.014	0.37 111
Acetophenone	NS	NS	0.4 U	0.38 U	0.36 U.I	0.36 U	0.37 11	0.37 111
Anthracene	500	1 000		0.38 U	0.02 1	0.091 1	0.07 0	0.37 111
Atrazine	NS	1,000	0.16	0.00 0	0.02.0	0.15	0.02.0	0.57 05
Benzaldehyde	NS	NS	0.4 11	0.18.0	0.36 111	0.36 U	0.10 0	0.10.00
Benzo(a)Anthracene	56	1		0.081	0.30 03	0.30	0.074	0.059 1
Benzo(a)Pyrene	<u> </u>	22			0.11 L	0.0	0.062	0.003 L
Benzo(b)Elucranthene	5.6	1 7	0.04 UU	0.007 3	0.15	0.2	0.002	0.062
Benzo(d h i)Bendene	5.0	1.7	0.04 05	0.095 J	0.15 L	0.32	0.092	0.002 L
Benzo(k)Fluerenthene	500	1,000		0.046 J	0.073 J	0.13 J	0.031 J	0.03 J
Benzul Rutul Deteoloto		1.7	0.04 05	0.020 J		0.11	0.031 J	0.027 J
Denzyi Dulyi Philialale	INS NS		0.4 05				0.37 0	0.37 05
Biprienyi (Diprienyi)	INS NC	INS NS	0.4 UJ		0.36 UJ		0.029 J	0.37 UJ
Bis(2-Chloroethoxy) Methane	NS NC	INS NG	0.4 0		0.36 UJ			0.37 UJ
Bis(2-Chioroethyl) Ether (2-Chioroethyl Ether)	NS	NS NG	0.04 0	0.038 0	0.036 0J	0.036 0	0.037 0	0.037 0J
Bis(2-Chioroisopropyi) Ether	NS	NS	0.4 0	0.38 0	0.36 UJ	0.36 0	0.37 0	0.37 UJ
Dis(2-Ethylnexyl) Phinalate	NS NC	NS NO	U.4 UJ	U.38 UJ	0.088 J	U.11 J		U.37 UJ
	NS	NS	0.4 0	0.38 0	0.36 UJ	0.36 0	0.37 0	0.37 UJ
	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.055 J	0.37 U	0.37 UJ
Chiysene	50	1	U.4 UJ	0.089 J	U.13 J	U.32 J	0.084 J	U.U67 J
	0.56	1,000	0.04 UJ	0.038 0	0.036 UJ	0.033 J	0.037 U	0.037 UJ
	350	210	U.4 UJ	U.38 U	U.36 UJ	0.014 J	0.018 J	U.37 UJ
Dietnyl Phthalate	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
Di-N-Octylphthalate	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
	500	1,000	0.014 J	0.12 J	0.19 J	0.63	0.12 J	0.1 J
	500	386	0.4 UJ	0.38 U	0.36 UJ	0.028 J	0.071 J	0.37 UJ
Hexachlorobenzene	6	3.2	0.04 UJ	0.038 U	0.036 UJ	0.036 U	0.037 U	0.037 UJ
Hexachlorobutadiene	NS	NS	0.08 UJ	0.077 U	0.074 UJ	0.074 U	0.074 U	0.076 UJ
Hexachlorocyclopentadiene	NS	NS	0.4 R	0.38 UJ	0.36 UJ	0.36 U	0.37 U	0.37 UJ
Hexachloroethane	NS	NS	0.04 UJ	0.038 U	0.036 UJ	0.036 U	0.037 U	0.037 UJ
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	0.04 UJ	0.048 J	0.092 L	0.15	0.052	0.035 J
Isophorone	NS	NS	0.16 U	0.15 U	0.15 UJ	0.15 U	0.15 U	0.15 UJ
Naphthalene	500	12	0.019 J	0.38 U	0.013 J	0.028 J	0.15 J	0.028 J
Nitrobenzene	NS	NS	0.04 U	0.038 U	0.036 UJ	0.036 U	0.037 U	0.037 UJ
N-Nitrosodi-N-Propylamine	NS	NS	0.04 U	0.038 U	0.036 UJ	0.036 U	0.037 U	0.037 UJ
N-Nitrosodiphenylamine	NS	NS	0.4 UJ	0.38 U	0.36 UJ	0.36 U	0.072 J	0.37 UJ
Pentachlorophenol	6.7	0.8	0.32 UJ	0.31 U	0.29 UJ	0.29 U	0.3 U	0.3 UJ
Phenanthrene	500	1,000	0.4 UJ	0.074 J	0.095 J	0.45	0.17 J	0.075 J
Phenol	500	0.33	0.4 U	0.38 U	0.36 UJ	0.36 U	0.37 U	0.37 UJ
Pyrene	500	1,000	0.4 UJ	0.13 J	0.21 J	0.52	0.15 J	0.11 J

#### Table 3Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NY

			,	9				
		AKRF Sample ID	EP-40 1 20200204	EP-41 1 20200203	EP-42 1 20200203	EP-X1 1 20200203	EP-43 1 20200204	EP-44 1 20200204
		aboratory Sample ID	460 202202 11	460,202180,2	460 202180 3	460,202180,6	460 202202 3	460 202202 4
	L		400-202292-11	400-202180-2	400-202180-3	400-202180-0	400-202292-3	400-202292-4
		Date Sampled	2/04/2020	2/03/2020	2/03/2020	2/03/2020	2/04/2020	2/04/2020
		Dilution Factor	1	1	1	1	1	1
		Linit	ma/ka	malka	ma/ka	ma/ka	ma/ka	malka
		Onit	тіу/ку	пуку	тту/ку	шу/ку	шу/ку	піў/ку
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q					
1245-Tetrachlorobenzene	NS	NS	0.37 [].]	0.38 U	0.37 []	0411	0.37 U	0.37 U
1 4 Diovono (D Diovono)	120	0.1	0.11.11			0.12.111		
1,4-Dioxane (P-Dioxane)	130	0.1	0.11 UJ	0.12 01	0.11 UJ	0.12 UJ	0.11 UJ	0.11 0J
2,3,4,6-Tetrachlorophenol	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
2.4.5-Trichlorophenol	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
	NIS	NS	0.15.111	0.15.11	0.15.11	0.16.11	0.15.11	0.15.11
	NO	110	0.15 00	0.15 0	0.15 0	0.10 0	0.15 0	0.15 0
2,4-Dichlorophenol	NS	NS	0.15 UJ	0.15 0	0.15 U	0.16 U	0.15 U	0.15 U
2,4-Dimethylphenol	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
2 4-Dinitrophenol	NS	NS	0.3 UJ	0.31 UT	0.3 R	0.33 R	03U	0.29 U
2.4 Dinitrotoluono	NC	NS	0.075 111	0.079 11	0.076 11	0.082.11	0.075 11	
2,4-Dinitrotoluene	INS	115	0.075 UJ	0.078 0	0.076 0	0.082 0	0.075 0	0.074 0
2,6-Dinitrotoluene	NS	NS	0.075 UJ	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
2-Chloronaphthalene	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
2-Chlorophenol	NS	NS	0.37 []]	0.38.11	0.37.11	0.4.11	0.37 []	0.37.11
	110	113	0.37 03	0.38 0	0.37 0	0.4 0	0.37 0	0.37 0
2-Methylnaphthalene	NS	NS	0.073 J	0.38 U	0.049 J	0.4 U	0.14 J	0.59
2-Methylphenol (O-Cresol)	500	0.33	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
2-Nitroaniline	NS	NS	0.37 [].]	0.38 UT	0.37 LIT	0.4 LIT	0.37 []	0.37 U
2 Nitrephenel		NC	0.07 111	0.00 01	0.07 01	0.4.111	0.07 U	0.07 U
	IN S	INS	U.37 UJ	0.36 0	0.37 UJ	0.4 UJ	0.37 0	0.37 0
3,3'-Dichlorobenzidine	NS	NS	0.15 UJ	0.15 UT	0.15 UJ	0.16 UJ	0.15 U	0.15 U
3-Nitroaniline	NS	NS	0.37 UJ	0.38 UT	0.37 UT	0.4 UT	0.37 U	0.37 U
4 6-Dinitro-2-Methylphenol	NIC	NS	03111		03 P	0 33 P	0311	0.20 11
			0.0 00		0.0 1		0.0 0	0.23 0
4-Bromophenyl Phenyl Ether	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
4-Chloro-3-Methylphenol	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
4-Chloroaniline	NS	NS	0.37 [1]	0.38.11	0.37 [1]	04111	0.37 [].]	0.37 []]
4 Chlerenhend Dhend Ether	NC	NC	0.07 00	0.00 U	0.07 11		0.07 00	0.07 11
4-Chiorophenyi Phenyi Ether	NS	NS	0.37 UJ	0.38 0	0.37 0	0.4 0	0.37 0	0.37 0
4-Methylphenol (P-Cresol)	500	0.33	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
4-Nitroaniline	NS	NS	0.37 UJ	0.38 U	0.37 UJ	0.4 UJ	0.37 U	0.37 U
1 Nitrophonol	NIS	NS	0.75	0.79.11	0.76 11	0.82.11	0.75	0.74
	110	113	0.75 05	0.78 0	0.70 0	0.82 0	0.75 0	0.74 0
Acenaphthene	500	98	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Acenaphthylene	500	107	0.37 UJ	0.38 U	0.11 J	0.4 U	0.012 J	0.015 J
Acetophenone	NS	NS	0.37 [].]	0.38 U	0.37 U	0411	0.37 []	0.16.1
	500	1,000	0.07 111	0.00 U	0.005 1		0.007 1	0.001
Anthracene	500	1,000	0.37 UJ	0.38 0	0.065 J	0.4 0	0.027 J	0.021 J
Atrazine	NS	NS	0.15 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Benzaldehvde	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Benzo(a)Anthracene	5.6	1	0.047	0.068 1	0.080 1	0.038 1	0.11	0.044
	5.0		0.047 L	0.008 J	0.089 J	0.038 3	0.11	0.044
Benzo(a)Pyrene	1	22	0.042 L	0.071 J	0.08 J	0.031 J	0.093	0.037 U
Benzo(b)Fluoranthene	5.6	1.7	0.058 L	0.081 J	0.12 J	0.04 J	0.14	0.037 U
Benzo(a h i)Pervlene	500	1 000	0.037 1	0.059 1	0.071	0.023 1	0.068.1	0.031 1
	500	1,000	0.007 111	0.009 0	0.007 1	0.020 0	0.000 3	0.007 11
Benzo(k)Fluoranthene	50	1.7	0.037 UJ	0.02 J	0.037 J	0.017 J	0.051	0.037 0
Benzyl Butyl Phthalate	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.06 J	0.37 U
Biphenyl (Diphenyl)	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.042 J
Pic(2 Chloroothoxy) Mothana	NIS	NS	0.27 111	0.29 11	0.27	0.1.1	0.27	
	110	115	0.37 03	0.36 0	0.37 0	0.4 0	0.37 0	0.37 0
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.037 UJ	0.038 U	0.037 U	0.04 U	0.037 U	0.037 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Bis(2-Ethylbexyl) Phthalate	NS	NS	0.22	0.38.111	0.16.1	0.029.1	03.1	0.57
	NC	NC	0.22.0		0.10 0	0.025 0	0.0 0	0.07
Caprolaciam	INS	115	0.37 UJ	0.38 0	0.37 0	0.4 0	0.37 0	0.37 0
Carbazole	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Chrysene	56	1	0.053 J	0.066 J	0.096 J	0.031 J	0.13 J	0.048 J
Dibenz(a h)Anthracene	0.56	1 000	0.037.11.1	0.038.11	0.037.11	0.04.11	0.037.11	0.037.11
Dibonzofuron	0.00	040	0.007 00	0.000 0	0.007 U		0.007 0	0.007 U
	350	21U	0.37 UJ	0.38 0	0.37 0	0.4 0	0.012 J	0.37 0
Diethyl Phthalate	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Dimethyl Phthalate	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Di-N-Butyl Phthalate	NS	NS	0.37.111	0.38.11	0 37 11	0411	0.37.11	0 37 11
	NO	110	0.07 0.0	0.00 U	0.07 U	0:4 0	0.07 U	0.07 U
	NS	NS	0.37 UJ	0.38 U	0.37 0	0.4 0	0.37 U	0.37 0
Fluoranthene	500	1,000	0.074 J	0.082 J	0.13 J	0.04 J	0.2 J	0.072 J
Fluorene	500	386	0.37 UJ	0.38 U	0.022 J	0.4 U	0.029 J	0.071 J
Hoveeblerebenzene	6	2.2	0.027.111	0.029.11	0.027	0.04.11	0.027	0.027.11
	0	5.2	0.037 03		0.037 0		0.037 0	0.037 0
Hexachlorobutadiene	NS	NS	0.075 UJ	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
Hexachlorocyclopentadiene	NS	NS	0.37 UJ	0.38 UJ	0.37 UJ	0.4 UJ	0.37 U	0.37 U
Hexachloroethane	NS	NS	0.037.111	0.038.11	0.037.11	0.04.11	0.037.11	0.037.11
			0.007 00	0.000 0	0.007 0		0.007 0	0.007 0
indeno(1,2,3-C,d)Pyrene	5.6	8.2	0.04 L	0.054 J	U.U67 J	0.022 J	0.069	0.04
Isophorone	NS	NS	0.15 UJ	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U
Naphthalene	500	12	0.064.1	0.38 U	0.031.1	0411	0.076.1	0.32 .1
Nitrobenzene	NIC	NQ	0.037 111	0.038 11	0.037.11		0.037.11	0.037.11
	110		0.037 03					
N-Nitrosodi-N-Propylamine	NS	NS	0.037 UJ	0.038 U	0.037 U	0.04 U	0.037 U	0.037 U
N-Nitrosodiphenylamine	NS	NS	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Pentachlorophenol	67	0.8	0.3 11.1	0.31 U	0311	0.33 U	0311	0 29 11
Phononthrone	E00	1 000	0.06 1	0.045	0.001 1	0.021 1	0.16 1	0.00 1
	500	1,000	0.00 J	0.040 J		U.UZIJ	0.10 J	
Phenol	500	0.33	0.37 UJ	0.38 U	0.37 U	0.4 U	0.37 U	0.37 U
Pyrene	500	1,000	0.087 J	0.1 J	0.15 J	0.046 J	0.21 J	0.13 J

#### Table 3Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NY

			ED 45 4 0000004				ED 40 7 00000000	CVN/ 04_ 4_ 00000000
		AKRF Sample ID	EP-45_1_20200204	EP-46_1_20200203	EP-47_1_20200204	EP-48_1_20200204	EP-49_7_20200226	500-01_4_20200226
		Laboratory Sample ID	460-202292-5	460-202180-1	460-202292-2	460-202292-1	460-203752-6	460-203752-2
		Date Sampled	2/04/2020	2/03/2020	2/04/2020	2/04/2020	2/26/2020	2/26/2020
		Dilution Factor	1	1	1	1	1	1
		Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CS	CO NYSDEC PGWSCO	CONC Q					
1 2 4 5-Tetrachlorobenzene	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0 43 U
1 4-Dioxane (P-Dioxane)	130	0.1		0.11 UT		0 11 111	0.17	0.13 U
2.2.4.6. Totrochlorophonol	NS	0.1	0.26 11	0.27 11	0.11 03	0.27 11	0.17 0	0.13 0
	INS NC	NS NS		0.37 0	0.37 03	0.37 0	0.55 0	0.43 0
	INS NO	NS		0.37 0	0.37 UJ	0.37 0	0.55 0	0.43 0
	NS	NS	0.15 0	0.15 U	0.15 UJ	0.15 0	0.22 U	0.17 0
2,4-Dichlorophenol	NS	NS	0.15 U	0.15 U	0.15 UJ	0.15 U	0.22 U	0.17 U
2,4-Dimethylphenol	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
2,4-Dinitrophenol	NS	NS	0.29 U	0.3 UT	0.3 UJ	0.3 U	0.44 U	0.35 U
2,4-Dinitrotoluene	NS	NS	0.073 U	0.076 U	0.076 UJ	0.076 U	0.11 U	0.088 U
2,6-Dinitrotoluene	NS	NS	0.073 U	0.076 U	0.076 UJ	0.076 U	0.11 U	0.088 U
2-Chloronaphthalene	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
2-Chlorophenol	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
2-Methylnaphthalene	NS	NS	0.014 J	0.37 U	0.41 L	0.017 J	0.27 J	0.053 J
2-Methylphenol (O-Cresol)	500	0.33	0.36 []	0.37 U	0.37 [1]	0.37 []	0.55.11	0.43 []
2-Nitroaniline	NS	NS	0.36 U	0.37 UT	0.37 111	0.37 U	0.55 U	
2-Nitrophenol	NIC	NC	0.36 U	0.37 11	0.07 0.0	0.37 11	0.55 0	0.43 11
2 2' Dichlorobanzidina			0.50 0		0.07 00	0.07 0		0.43 0
	NS NC	INS NO	0.15 U		0.15 UJ	0.15 U	0.22 U	0.17 U
	NS NS	NS NS	U.36 U	0.37 UT	U.37 UJ	0.37 U	0.55 U	U.43 U
4,6-Dinitro-2-Methylphenol	NS	NS	0.29 U	0.3 UT	0.3 UJ	0.3 U	0.44 U	0.35 U
4-Bromophenyl Phenyl Ether	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
4-Chloro-3-Methylphenol	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
4-Chloroaniline	NS	NS	0.36 UJ	0.37 U	0.37 UJ	0.37 UJ	0.55 U	0.43 U
4-Chlorophenyl Phenyl Ether	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
4-Methylphenol (P-Cresol)	500	0.33	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
4-Nitroaniline	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
4-Nitrophenol	NS	NS	0.73 U	0.76 U	0.76 UJ	0.76 U	1.1 U	0.88 U
Acenaphthene	500	98	0.36 U	0.37 U	0.37 [J.]	0.37 U	0.55 U	0.43 U
Acenaphthylene	500	107	0.36 U	0.37 U	0.37	0.37 11	0.55	
Acetophenone	NS	NS	0.36 U	0.37 0	0.37 111	0.37 U	0.55 U	0.013 5
Action	500	1,000		0.02	0.37 03	0.37 0	0.55 0	0.45 0
Anunacene	500	1,000		0.02 J	0.37 UJ	0.37 0	0.55 0	0.045 J
Atrazine	NS NC	INS NG	0.15 0	0.15 0	0.15 UJ	0.15 0	0.22 0	0.17 0
Benzaldenyde	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 0	0.55 U	0.43 U
Benzo(a)Anthracene	5.6	1	0.063	0.054 J	0.028 J	0.063	0.019 J	0.14
Benzo(a)Pyrene	1	22	0.051	0.039 J	0.015 J	0.052	0.055 U	0.11
Benzo(b)Fluoranthene	5.6	1.7	0.074	0.051 J	0.025 J	0.076	0.055 U	0.14
Benzo(g,h,i)Perylene	500	1,000	0.04 J	0.027 J	0.37 UJ	0.035 J	0.55 U	0.063 J
Benzo(k)Fluoranthene	56	1.7	0.027 J	0.018 J	0.01 J	0.033 J	0.055 U	0.063
Benzyl Butyl Phthalate	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Biphenyl (Diphenyl)	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.036 U	0.037 U	0.037 UJ	0.037 U	0.055 U	0.043 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.36 U	0.37 U	0.37 [J.]	0.37 U	0.55 U	0.43 U
Bis(2-Ethylbexyl) Phthalate	NS	NS		0.029.1	0.077.1	0.089.1	0.55	0.049.1
Caprolactam	NS	NS	0.36 U	0.023 3	0.37 111	0.003 0	0.55 U	
Carbazole	NIC	NC	0.00 0	0.37 U	0.07 0.0	0.37 U	0.55 0	
Chryson							0.03 0	
Dibonz(a b)Anthropona	50	1 000					0.050 U	0.14 J
	0.56	1,000		0.037 0	0.037 UJ	0.037 0		0.043 U
	350	210	U.36 U	U.37 U	0.37 UJ	U.37 U	0.55 U	U.43 U
Diethyl Phthalate	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Dimethyl Phthalate	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Di-N-Butyl Phthalate	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Di-N-Octylphthalate	NS	NS	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Fluoranthene	500	1,000	0.12 J	0.08 J	0.058 J	0.084 J	0.55 U	0.28 J
Fluorene	500	386	0.01 J	0.37 U	0.021 J	0.37 U	0.55 U	0.024 J
Hexachlorobenzene	6	3.2	0.036 U	0.037 U	0.037 UJ	0.037 U	0.055 U	0.043 U
Hexachlorobutadiene	NS	NS	0.073 U	0.076 U	0.076 UJ	0.076 U	0.11 U	0.088 U
Hexachlorocyclopentadiene	NS	NS	0.36 U	0.37 UJ	0.37 UJ	0.37 U	0.55 U	0.43 U
Hexachloroethane	NS	NS	0.036 U	0.037 U	0.037 UJ	0.037 U	0.055 U	0.043 U
Indeno(1.2.3-c.d)Pvrene	5.6	8.2	0.043	0.029 J	0.017 J	0.043	0.055 U	0.085
Isophorone	NIS	NS	0 15 11	0.15.11	0 15 111	0 15 11	0.22 11	0.17.11
Nanhthalene	500	12	0.024	0.10.0	0.15.1	0.014	0.25 1	0.052 1
Nitrobenzene	NIC	NIC	0.024 0	0.07 U	0.10.0		0.200	0.002 0
N Nitrosodi N Propulamina		NO					0.000 0	
N Nitropodinhony domina								
		INS 0.0		0.37 0	U.37 UJ	0.37 0		0.43 U
	0./	υ.8	0.29 0	U.3 U	U.3 UJ	U.3 U	0.44 U	U.35 U
	500	1,000	0.099 J	0.07 J	0.097 J	0.056 J	0.55 U	0.22 J
Phenol	500	0.33	0.36 U	0.37 U	0.37 UJ	0.37 U	0.55 U	0.43 U
Pyrene	500	1,000	0.12 J	0.082 J	0.06 J	0.089 J	0.55 U	0.28 J

#### Table 3Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NYPost-Excavation Soil Endpoint Sampling

Soil Analytical Results of Semivolatile Organic Compounds (SVOCs)

	I	AKRF Sample ID Laboratory Sample ID Date Sampled Dilution Factor	SW-02_4_20200226 460-203752-3 2/26/2020 1	SW-03_4_20200226 460-203752-4 2/26/2020 1	SW-04_4_20200226 460-203752-5 2/26/2020 1	SW-04_3_20200501 460-208010-6 5/01/2020 1	EP-FB-04_20200501 460-208010-9 5/01/2020 1	FB-03_20200226 460-203752-10 2/26/2020 1
-		Unit	mg/kg	mg/kg	mg/kg	mg/kg	μg/L	μg/L
Compound	NYSDEC CSCO							
1,2,4,5- l etrachiorobenzene	120	NS 0.1	0.43 U	0.42 0	0.42 0	0.41 U		
2.3.4.6-Tetrachlorophenol	NS	0.1 NS	0.13 0	0.13 0	0.13 0	0.13 03		
2.4.5-Trichlorophenol	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 UJ
2,4,6-Trichlorophenol	NS	NS	0.17 U	0.17 U	0.17 U	0.17 U	10 UJ	10 UJ
2,4-Dichlorophenol	NS	NS	0.17 U	0.17 U	0.17 U	0.17 U	10 UJ	10 UJ
2,4-Dimethylphenol	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 UJ
2,4-Dinitrophenol	NS	NS	0.35 U	0.34 U	0.34 U	0.33 U	20 UJ	20 UJ
2,4-Dinitrotoluene	NS	NS	0.087 U	0.085 U	0.085 U	0.084 U	20	20
2,6-Dinitrotoluene	NS NS	N5 NS	0.087 0		0.085 0	0.084 0	20	
2-Chlorophenol	NS	NS	0.43 U	0.42 U	0.42 0	0.41 U		10 U.I
2-Methylnaphthalene	NS	NS	0.072 J	0.68	0.32 J	0.41 U	10 U	10 U
2-Methylphenol (O-Cresol)	500	0.33	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 UJ
2-Nitroaniline	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
2-Nitrophenol	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 UJ
3,3'-Dichlorobenzidine	NS	NS	0.17 U	0.17 U	0.17 U	0.17 U	10 U	10 U
3-INITROANIIINE	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
	NO		0.35 U	0.34 0	0.34 0	0.33 0	20 0	20 UJ 10 U
4-Chloro-3-Methylphenol	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U.I	10 11.1
4-Chloroaniline	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
4-Chlorophenyl Phenyl Ether	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
4-Methylphenol (P-Cresol)	500	0.33	0.43 U	0.04 J	0.42 U	0.41 U	10 UJ	10 UJ
4-Nitroaniline	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
4-Nitrophenol	NS	NS	0.87 U	0.85 U	0.85 U	0.84 U	20 UJ	20 UJ
Acenaphthene	500	98	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
	500 NS	107 NS		0.42 0	0.42 0			
Anthracene	500	1 000	0.43 U	0.42 U	0.42 0	0.41 U	10 U	10 U
Atrazine	NS	NS	0.17 U	0.025 J	0.17 U	0.17 U	2 U	2 U
Benzaldehyde	NS	NS	0.43 U	0.42 U	0.42 U	0.41 UJ	10 U	10 U
Benzo(a)Anthracene	5.6	1	0.049	0.056	0.1	0.047 J	1 U	1 U
Benzo(a)Pyrene	1	22	0.043 U	0.039 J	0.042 U	0.041 J	1 U	<u> </u>
Benzo(b)Fluoranthene	5.6	1.7	0.054	0.056	0.042 U	0.049 J	2 U	<u> </u>
Benzo(g,h,i)Perylene	500	1,000	0.027 J	0.028 J	0.42 0	0.022 J	10 U	
Benzyl Butyl Phthalate		I.7 NS		0.02 J	0.042 0	0.02 J	10 11	10 11
Biphenyl (Diphenyl)	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	0.043 U	0.042 U	0.042 U	0.041 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	NS	NS	0.046 J	0.26 J	4.7	0.076 J	2 U	2 U
Caprolactam	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 UJ
Carbazole	NS	N5 1	0.43 U	0.42 0	0.42 0			
Dibenz(a.h)Anthracene	0.56	1.000	0.043 U	0.042 []	0.042 U	0.040 J	1 IJ	1
Dibenzofuran	350	210	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Diethyl Phthalate	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Dimethyl Phthalate	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Di-N-Butyl Phthalate	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Di-N-Octylphthalate	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 U	10 U
Fluoranthene	500	1,000	0.067 J	0.087 J	0.2 J	0.07 J	10 U	
Heyachlorobenzene	500	3.2	0.010 5	0.42 0	0.42 0	0.041 U		
Hexachlorobutadiene	NS	NS	0.087 U	0.085 U	0.085 U	0.084 U	1 U.I	1 U
Hexachlorocyclopentadiene	NS	NS	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 U
Hexachloroethane	NS	NS	0.043 U	0.042 U	0.042 U	0.041 U	2 UJ	2 U
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	0.03 J	0.027 J	0.042 U	0.045 J	2 U	2 U
Isophorone	NS	NS	0.17 U	0.17 U	0.17 U	0.17 U	10 U	10 U
Naphthalene	500	12	0.15 J	0.42 U	0.19 J	0.41 U	2 U	10 U
Nitropenzene	NS NC	NS NC	0.043 U	0.042 U	0.042 U	0.041 U		10
N-Nitrosodiphenylamine			0.043 0	0.042 U 0 42 H			10 11	10 11
Pentachlorophenol	6.7	0.8	0.35 U	0.34 U	0.34 U	0.33 U	20 U	20 11.1
Phenanthrene	500	1,000	0.066 J	0.42 U	0.19 J	0.035 J	10 U	10 U
Phenol	500	0.33	0.43 U	0.42 U	0.42 U	0.41 U	10 UJ	10 UJ
Pyrene	500	1,000	0.074 J	0.11 J	0.28 J	0.074 J	10 U	10 U

Table 3Queens Animal Shelter and Care Center

151 Woodward Avenue, Queens, NY

		AKRE Sample ID	EB_1 20200203
			FB-1_20200203
	L	aboratory Sample ID	460-202180-5
		Date Sampled	2/03/2020
		Dilution Factor	1
		Unit	µg/L
Compound	NYSDEC CSCO	NYSDEC PGWSCO	CONC Q
1,2,4,5-Tetrachlorobenzene	NS	NS	10 UJ
1,4-Dioxane (P-Dioxane)	130	0.1	NR
2.3.4.6-Tetrachlorophenol	NS	NS	10 UJ
2.4.5-Trichlorophenol	NS	NS	10 UJ
2 4 6-Trichlorophenol	NS	NS	10 11
2.4-Dichlorophenol	NS	NS	
2.4 Dimethylphenol	NS	NS	
2,4-Dinietrophonol	NS	NS	20 11 1
2,4-Dinitrophenol		NS	20 03
	NS NO	NS NC	20
	NS NO	NS NC	20
	NS NO	NS NO	10 U
	NS	NS	10 UJ
2-Methylnaphthalene	NS	NS	<u> </u>
2-Methylphenol (O-Cresol)	500	0.33	10 UJ
2-Nitroaniline	NS	NS	10 U
2-Nitrophenol	NS	NS	10 UJ
3,3'-Dichlorobenzidine	NS	NS	10 U
3-Nitroaniline	NS	NS	10 U
4,6-Dinitro-2-Methylphenol	NS	NS	20 UJ
4-Bromophenyl Phenyl Ether	NS	NS	10 U
4-Chloro-3-Methylphenol	NS	NS	10 UJ
4-Chloroaniline	NS	NS	10 U
4-Chlorophenyl Phenyl Ether	NS	NS	10 U
4-Methylphenol (P-Cresol)	500	0.33	10 U.I
4-Nitroaniline	NS	NS	
4-Nitrophenol	NS	NS	20 11 1
	500	08	10 11
	500	90	10 U
Acenaphinylene	500 NS	107	10 U
	NS	INS 1.000	10 0
Anthracene	500	1,000	10 U
Atrazine	NS	NS	20
Benzaldehyde	NS	NS	10 U
Benzo(a)Anthracene	5.6	1	1 U
Benzo(a)Pyrene	1	22	1 U
Benzo(b)Fluoranthene	5.6	1.7	2 U
Benzo(g,h,i)Perylene	500	1,000	10 U
Benzo(k)Fluoranthene	56	1.7	1 U
Benzyl Butyl Phthalate	NS	NS	10 U
Biphenyl (Diphenyl)	NS	NS	10 U
Bis(2-Chloroethoxy) Methane	NS	NS	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	NS	NS	1 U
Bis(2-Chloroisopropyl) Ether	NS	NS	10 U
Bis(2-Ethylbexyl) Phthalate	NS	NS	211
Caprolactam	NS	NS	
Carbazole	NO	NS	10 03
Carbazole	N3 56	1	10 0
Chrysene Diberz(a b)Anthroppen	50	1 000	20
Dibenz(a,n)Antiliacene	0.56	1,000	10
	350	210	10 0
	NS NS	NS	10 U
Dimethyl Phthalate	NS	NS	10 U
Di-N-Butyl Phthalate	NS	NS	10 U
Di-N-Octylphthalate	NS	NS	10 U
Fluoranthene	500	1,000	10 U
Fluorene	500	386	10 U
Hexachlorobenzene	6	3.2	1 U
Hexachlorobutadiene	NS	NS	1 UJ
Hexachlorocyclopentadiene	NS	NS	10 U
Hexachloroethane	NS	NS	2 U
Indeno(1,2,3-c,d)Pyrene	5.6	8.2	2 U
Isophorone	NS	NS	10 U
Naphthalene	500	12	10 U
Nitrobenzene	NS	NS	1 11
N-Nitrosodi-N-Propylamine	NS	NS	1
N-Nitrosodinhenvlamine	NC	NC	10 11
Pentachloronhenol	67		20 11 1
Phononthrong	0.7	0.0	20 UJ
	500	1,000	
	500	0.33	
Pyrene	500	1,000	10 U

	FB-2 20200217
	460-203168-2
	2/17/2020
	1
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	μg/L
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	<u> </u>
	NR
	10 UJ
	10 U.I
	10 00
	<u> </u>
	10 11.1
	10 00
	10 UJ
	20 U.I
	2 U
	2 U
	10.11
	10 0
	10 UJ
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	10.0
-	10 UJ
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	AKRF Sample ID	EP-01_1_20200618	EP-01_1_20200618	EP-02_1_20200618	EP-02_1_20200618	EP-03_1_20200618
Labo	ratory Sample ID	460-211428-1	460-211428-1	460-211428-4	460-211428-4	460-211428-9
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	10,500	NR	7,240	NR
Antimony	NS	NR	0.27 J	NR	0.27 J	NR
Arsenic	16	NR	4.2	NR	4.2	NR
Barium	400	NR	93.4	NR	64.9	NR
Beryllium	590	NR	0.6	NR	0.39	NR
Cadmium	9.3	NR	0.98	NR	0.61 J	NR
Calcium	NS	NR	8,040 J	NR	1,650 J	NR
Chromium, Hexavalent	400	0.42 J	NR	2.1 UJ	NR	2.3 UJ
Chromium, Total	NS	NR	16.3 H	NR	16.8	NR
Cobalt	NS	NR	4.9 J	NR	6.5 J	NR
Copper	270	NR	38.5 H	NR	43.9	NR
Iron	NS	NR	14,200 J	NR	16,800 J	NR
Lead	1,000	NR	140	NR	122	NR
Magnesium	NS	NR	2,340 J	NR	1,880 J	NR
Manganese	10,000	NR	403 J	NR	304 J	NR
Mercury	2.8	0.37	NR	0.54	NR	0.59
Nickel	310	NR	17.1 H	NR	13.6	NR
Potassium	NS	NR	547	NR	792	NR
Selenium	1,500	NR	0.31 J	NR	0.31 J	NR
Silver	1,500	NR	0.91 U	NR	0.84 U	NR
Sodium	NS	NR	120 U	NR	98.4 U	NR
Thallium	NS	NR	0.12 J	NR	0.11 J	NR
Vanadium	NS	NR	24.8	NR	23.5	NR
Zinc	10,000	NR	267	NR	153	NR

	AKRF Sample ID	EP-03_1_20200618	EP-04_1_20200616	EP-04_1_20200616	EP-04_1_20200616	EP-05_1_20200618
Labo	ratory Sample ID	460-211428-9	460-211215-1	460-211215-1	460-211215-1	460-211428-2
	Date Sampled	6/18/2020	6/16/2020	6/16/2020	6/16/2020	6/18/2020
	<b>Dilution Factor</b>	10	1	3	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	8,560	NR	NR	11,900	NR
Antimony	NS	0.84 J	NR	NR	0.39 J	NR
Arsenic	16	4.9	NR	NR	7.1 J	NR
Barium	400	124	NR	NR	94.7	NR
Beryllium	590	0.39	NR	NR	0.55	NR
Cadmium	9.3	1.6	NR	NR	1 J	NR
Calcium	NS	4,470 J	NR	NR	12,100 J	NR
Chromium, Hexavalent	400	NR	2.3 UJ	NR	NR	0.41 J
Chromium, Total	NS	20.4	NR	NR	19.8 H	NR
Cobalt	NS	7.7 J	NR	NR	15.4 J	NR
Copper	270	115	NR	NR	50.5	NR
Iron	NS	19,800 J	NR	NR	25,100 J	NR
Lead	1,000	350	NR	NR	176 J	NR
Magnesium	NS	2,370 J	NR	NR	6,680 J	NR
Manganese	10,000	272 J	NR	NR	379 J	NR
Mercury	2.8	NR	NR	0.75	NR	0.66
Nickel	310	22.9	NR	NR	30.3 J	NR
Potassium	NS	640	NR	NR	678 H	NR
Selenium	1,500	0.51 J	NR	NR	0.35 J	NR
Silver	1,500	0.9 U	NR	NR	1.2 U	NR
Sodium	NS	120 UJ	NR	NR	279	NR
Thallium	NS	0.36 U	NR	NR	0.47 U	NR
Vanadium	NS	28.7	NR	NR	29.5	NR
Zinc	10,000	855	NR	NR	369 J	NR

	AKRF Sample ID	EP-05_1_20200618	EP-06_1_20200618	EP-06_1_20200618	EP-06_1_20200618	EP-07_1_20200618
Labo	ratory Sample ID	460-211428-2	460-211428-5	460-211428-5	460-211428-5	460-211428-7
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	<b>Dilution Factor</b>	10	1	3	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	6,010	NR	NR	6,270	NR
Antimony	NS	0.65 J	NR	NR	1.6	NR
Arsenic	16	6.5	NR	NR	6.8	NR
Barium	400	111	NR	NR	138	NR
Beryllium	590	0.35	NR	NR	0.34	NR
Cadmium	9.3	0.66 J	NR	NR	3.3	NR
Calcium	NS	3,230 J	NR	NR	5,360 J	NR
Chromium, Hexavalent	400	NR	2.2 UJ	NR	NR	0.48 J
Chromium, Total	NS	15.9	NR	NR	20.6	NR
Cobalt	NS	6.2 J	NR	NR	6.6 J	NR
Copper	270	62.9	NR	NR	106	NR
Iron	NS	13,600 J	NR	NR	46,300 J	NR
Lead	1,000	252	NR	NR	504	NR
Magnesium	NS	1,340 J	NR	NR	1,940 J	NR
Manganese	10,000	317 J	NR	NR	304 J	NR
Mercury	2.8	NR	NR	0.42	NR	NR
Nickel	310	13.4	NR	NR	25	NR
Potassium	NS	512	NR	NR	609	NR
Selenium	1,500	0.27 J	NR	NR	0.51 J	NR
Silver	1,500	0.87 U	NR	NR	0.82 U	NR
Sodium	NS	217 UJ	NR	NR	149 U	NR
Thallium	NS	0.35 U	NR	NR	0.1 J	NR
Vanadium	NS	17.6	NR	NR	23.6	NR
Zinc	10,000	395	NR	NR	512	NR

	AKRF Sample ID	EP-07_1_20200618	EP-07_1_20200618	EP-07_1_20200618	EP-08_1_20200618	EP-08_1_20200618
Labo	ratory Sample ID	460-211428-7	460-211428-7	460-211428-7	460-211428-3	460-211428-3
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	<b>Dilution Factor</b>	5	10	20	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	5,470	NR	NR	15,900
Antimony	NS	NR	2.8	NR	NR	0.74 J
Arsenic	16	NR	9.6	NR	NR	3.9
Barium	400	NR	312	NR	NR	191
Beryllium	590	NR	0.36	NR	NR	6.1
Cadmium	9.3	NR	16.4	NR	NR	1.1
Calcium	NS	NR	21,300 J	NR	NR	38,400 J
Chromium, Hexavalent	400	NR	NR	NR	2.1 UJ	NR
Chromium, Total	NS	NR	33.6	NR	NR	20.3
Cobalt	NS	NR	9.1 J	NR	NR	29.5 J
Copper	270	NR	268	NR	NR	79.6
Iron	NS	NR	37,100 J	NR	NR	12,100 J
Lead	1,000	NR	1,260	NR	NR	946
Magnesium	NS	NR	4,070 J	NR	NR	1,270 J
Manganese	10,000	NR	336 J	NR	NR	175 J
Mercury	2.8	2	NR	NR	0.21	NR
Nickel	310	NR	55.7	NR	NR	39.4
Potassium	NS	NR	934	NR	NR	1,950
Selenium	1,500	NR	0.59 J	NR	NR	0.41 J
Silver	1,500	NR	0.72 J	NR	NR	0.81 U
Sodium	NS	NR	333 B	NR	NR	672 B
Thallium	NS	NR	0.35 U	NR	NR	0.32 U
Vanadium	NS	NR	33.3	NR	NR	36.2
Zinc	10,000	NR	NR	1,630	NR	193

	AKRF Sample ID	EP-09_1_20200618	EP-09_1_20200618	EP-10_1_20200618	EP-10_1_20200618	EP-10_1_20200618
Labo	ratory Sample ID	460-211428-6	460-211428-6	460-211428-8	460-211428-8	460-211428-8
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	<b>Dilution Factor</b>	1	10	1	10	20
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	4,960	NR	7,570	NR
Antimony	NS	NR	0.56 J	NR	1.6	NR
Arsenic	16	NR	5.9	NR	6.3	NR
Barium	400	NR	91.6	NR	164	NR
Beryllium	590	NR	0.43	NR	0.41	NR
Cadmium	9.3	NR	1.2	NR	2.9	NR
Calcium	NS	NR	77,700 J	NR	4,090 J	NR
Chromium, Hexavalent	400	2.1 UJ	NR	2.1 UJ	NR	NR
Chromium, Total	NS	NR	14.8	NR	26.4	NR
Cobalt	NS	NR	5.5 J	NR	8.2 J	NR
Copper	270	NR	62.4	NR	173	NR
Iron	NS	NR	17,900 J	NR	20,700 J	NR
Lead	1,000	NR	235	NR	501	NR
Magnesium	NS	NR	36,400 J	NR	1,890 J	NR
Manganese	10,000	NR	247 J	NR	317 J	NR
Mercury	2.8	0.43	NR	0.68	NR	NR
Nickel	310	NR	15.4	NR	25.6	NR
Potassium	NS	NR	522	NR	699	NR
Selenium	1,500	NR	0.42 J	NR	0.64 J	NR
Silver	1,500	NR	0.83 U	NR	0.77 U	NR
Sodium	NS	NR	121 UJ	NR	181 U	NR
Thallium	NS	NR	0.33 U	NR	0.13 J	NR
Vanadium	NS	NR	19	NR	25.6	NR
Zinc	10,000	NR	269	NR	NR	999

	AKRF Sample ID	EP-11_1_20200618	EP-11_1_20200618	EP-11_1_20200618	EP-11_1_20200618	EP-12_1_20200612
Labo	ratory Sample ID	460-211428-10	460-211428-10	460-211428-10	460-211428-10	460-210991-4
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/12/2020
	<b>Dilution Factor</b>	1	3	10	50	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	NR	4,310	NR	NR
Antimony	NS	NR	NR	1.8	NR	NR
Arsenic	16	NR	NR	5.5	NR	NR
Barium	400	NR	NR	199	NR	NR
Beryllium	590	NR	NR	0.32 J	NR	NR
Cadmium	9.3	NR	NR	1.2	NR	NR
Calcium	NS	NR	NR	2,410 J	NR	NR
Chromium, Hexavalent	400	2.1 UJ	NR	NR	NR	2.3 UJ
Chromium, Total	NS	NR	NR	30.1	NR	NR
Cobalt	NS	NR	NR	12.2 J	NR	NR
Copper	270	NR	NR	354	NR	NR
Iron	NS	NR	NR	19,700 J	NR	NR
Lead	1,000	NR	NR	502	NR	NR
Magnesium	NS	NR	NR	1,180 J	NR	NR
Manganese	10,000	NR	NR	268 J	NR	NR
Mercury	2.8	NR	1	NR	NR	0.82
Nickel	310	NR	NR	25.2	NR	NR
Potassium	NS	NR	NR	555	NR	NR
Selenium	1,500	NR	NR	0.84 J	NR	NR
Silver	1,500	NR	NR	0.83 U	NR	NR
Sodium	NS	NR	NR	221 UJ	NR	NR
Thallium	NS	NR	NR	0.15 J	NR	NR
Vanadium	NS	NR	NR	18.3	NR	NR
Zinc	10,000	NR	NR	NR	2,200	NR

	AKRF Sample ID	EP-12_1_20200612	EP-13_1_20200612	EP-13_1_20200612	EP-14_1_20200501	EP-14_1_20200501
Labo	ratory Sample ID	460-210991-4	460-210991-5	460-210991-5	460-208010-1	460-208010-1
	Date Sampled	6/12/2020	6/12/2020	6/12/2020	5/01/2020	5/01/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	4,840	NR	7,250	NR	13,200
Antimony	NS	1.4	NR	5.6 L	NR	0.56 J
Arsenic	16	6.4	NR	8.9 J	NR	4.3 J
Barium	400	137	NR	161	NR	81.6
Beryllium	590	0.26 J	NR	0.33 J	NR	0.51
Cadmium	9.3	1.9	NR	2.4 J	NR	1.1 U
Calcium	NS	2,200	NR	3,370 J	NR	1,130 J
Chromium, Hexavalent	400	NR	2.4 UJ	NR	2.3 U	NR
Chromium, Total	NS	24.6	NR	23.6	NR	21.5
Cobalt	NS	5.1	NR	7.6 L	NR	6.9
Copper	270	141	NR	192	NR	33.4 L
Iron	NS	14,300	NR	22,100	NR	21,400
Lead	1,000	804	NR	483 J	NR	63.8
Magnesium	NS	1,250	NR	1,700	NR	2,310
Manganese	10,000	179	NR	427 J	NR	285 J
Mercury	2.8	NR	NR	3.2	0.24	NR
Nickel	310	17.1	NR	21.8	NR	15.1
Potassium	NS	548	NR	694	NR	687
Selenium	1,500	0.53 J	NR	1.2 J	NR	0.34 J
Silver	1,500	0.94 U	NR	0.9 U	NR	1.1 U
Sodium	NS	184	NR	207	NR	71.2 J
Thallium	NS	0.38 U	NR	0.16 J	NR	0.13 J
Vanadium	NS	19.3	NR	25.9 L	NR	30.3
Zinc	10,000	493 J	NR	545 J	NR	89.8 J

	AKRF Sample ID	EP-X04_1_20200501	EP-X04_1_20200501	EP-15_1_20200501	EP-15_1_20200501	EP-16_1_20200501
Labo	ratory Sample ID	460-208010-7	460-208010-7	460-208010-2	460-208010-2	460-208010-3
	Date Sampled	5/01/2020	5/01/2020	5/01/2020	5/01/2020	5/01/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NR	15,100	NR	18,100	NR
Antimony	NS	NR	1.1 UJ	NR	1.1 U	NR
Arsenic	16	NR	4.8 J	NR	3.9	NR
Barium	400	NR	79.1	NR	97.6	NR
Beryllium	590	NR	0.55	NR	0.81	NR
Cadmium	9.3	NR	1.1 U	NR	1.1 U	NR
Calcium	NS	NR	1,210 J	NR	1,970	NR
Chromium, Hexavalent	400	2.3 U	NR	2.4 U	NR	2.2 U
Chromium, Total	NS	NR	27.7	NR	37	NR
Cobalt	NS	NR	11.4	NR	10.6	NR
Copper	270	NR	39.8 L	NR	37.2	NR
Iron	NS	NR	27,300	NR	28,200	NR
Lead	1,000	NR	58	NR	30.7	NR
Magnesium	NS	NR	3,090	NR	4,070	NR
Manganese	10,000	NR	532 J	NR	437 J	NR
Mercury	2.8	0.17	NR	0.13	NR	0.068
Nickel	310	NR	23.5	NR	26.3	NR
Potassium	NS	NR	1,060	NR	1,440	NR
Selenium	1,500	NR	0.33 J	NR	0.33 J	NR
Silver	1,500	NR	1.1 U	NR	1.1 U	NR
Sodium	NS	NR	79.3 J	NR	204	NR
Thallium	NS	NR	0.14 J	NR	0.15 J	NR
Vanadium	NS	NR	37.9	NR	45.8	NR
Zinc	10,000	NR	130 J	NR	76.6	NR

	AKRF Sample ID	EP-16_1_20200501	EP-17_1_20200612	EP-17_1_20200612	EP-18_1_20200612	EP-18_1_20200612
Labo	ratory Sample ID	460-208010-3	460-210991-1	460-210991-1	460-210991-2	460-210991-2
	Date Sampled	5/01/2020	6/12/2020	6/12/2020	6/12/2020	6/12/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	13,400	NR	7,560	NR	12,200
Antimony	NS	1.1 U	NR	1.2	NR	1 U
Arsenic	16	4.7	NR	5	NR	3.4
Barium	400	63	NR	92.7	NR	63.6
Beryllium	590	0.6	NR	0.33 J	NR	0.41
Cadmium	9.3	1.1 U	NR	2.3	NR	0.35 J
Calcium	NS	1,770	NR	5,480	NR	1,400
Chromium, Hexavalent	400	NR	1.7 L	NR	2.3 UJ	NR
Chromium, Total	NS	29.1	NR	22.2	NR	27.1
Cobalt	NS	10.5	NR	8.2	NR	6.1
Copper	270	29.2	NR	103	NR	37.2
Iron	NS	26,700	NR	24,200	NR	19,300
Lead	1,000	41.7	NR	226	NR	57.3
Magnesium	NS	3,260	NR	2,600	NR	1,870
Manganese	10,000	537 J	NR	403	NR	228
Mercury	2.8	NR	0.19	NR	0.21	NR
Nickel	310	19.1	NR	30	NR	15.5
Potassium	NS	1,150	NR	717	NR	592
Selenium	1,500	0.32 J	NR	0.31 J	NR	0.37 J
Silver	1,500	1.1 U	NR	0.95 U	NR	1 U
Sodium	NS	114	NR	178	NR	141
Thallium	NS	0.44 U	NR	0.38 U	NR	0.41 U
Vanadium	NS	38.5	NR	25.7	NR	32
Zinc	10,000	88.7	NR	643 J	NR	86.7 J

	AKRF Sample ID	EP-19_1_20200612	EP-19_1_20200612	EP-20_1_20200217	EP-20_1_20200217	EP-21_1_20200501
Labo	ratory Sample ID	460-210991-3	460-210991-3	460-203168-11	460-203168-11	460-208010-4
	Date Sampled	6/12/2020	6/12/2020	2/17/2020	2/17/2020	5/01/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	10,100	NR	9,380	NR
Antimony	NS	NR	0.79 J	NR	0.76 J	NR
Arsenic	16	NR	4.4	NR	4.4 J	NR
Barium	400	NR	108	NR	75.3 J	NR
Beryllium	590	NR	0.39	NR	0.45	NR
Cadmium	9.3	NR	1.2	NR	0.57 J	NR
Calcium	NS	NR	1,870	NR	1,750 J	NR
Chromium, Hexavalent	400	2.2 UJ	NR	2.2 U	NR	2.2 U
Chromium, Total	NS	NR	25.5	NR	28.3	NR
Cobalt	NS	NR	6.4	NR	9.6	NR
Copper	270	NR	63.5	NR	96.7 J	NR
Iron	NS	NR	20,700	NR	21,500	NR
Lead	1,000	NR	135	NR	128 J	NR
Magnesium	NS	NR	1,950	NR	2,040	NR
Manganese	10,000	NR	300	NR	342	NR
Mercury	2.8	0.35	NR	0.19 J	NR	0.02
Nickel	310	NR	19	NR	19.5	NR
Potassium	NS	NR	674	NR	637	NR
Selenium	1,500	NR	0.58 J	NR	0.31 J	NR
Silver	1,500	NR	0.97 U	NR	1 U	NR
Sodium	NS	NR	155	NR	182	NR
Thallium	NS	NR	0.39 U	NR	0.42 U	NR
Vanadium	NS	NR	32.6	NR	26.8	NR
Zinc	10,000	NR	223 J	NR	871 J	NR

	AKRF Sample ID	EP-21_1_20200501	EP-22_1_20200501	EP-22_1_20200501	EP-23_1_20200226	EP-23_1_20200226
Labo	ratory Sample ID	460-208010-4	460-208010-5	460-208010-5	460-203752-9	460-203752-9
	Date Sampled	5/01/2020	5/01/2020	5/01/2020	2/26/2020	2/26/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	11,900	NR	13,500	NR	6,130
Antimony	NS	1.1 U	NR	1 U	NR	0.99 UJ
Arsenic	16	3.6	NR	4.2	NR	2
Barium	400	47.5	NR	46.6	NR	42.3
Beryllium	590	0.61	NR	0.59	NR	0.37 J
Cadmium	9.3	1.1 U	NR	1 U	NR	0.99 U
Calcium	NS	1,040	NR	1,260	NR	1,230 J
Chromium, Hexavalent	400	NR	2.2 U	NR	2.2 UJ	NR
Chromium, Total	NS	26.4	NR	40.1	NR	13
Cobalt	NS	10.6	NR	11	NR	5.3
Copper	270	21.4	NR	22.4	NR	20.1
Iron	NS	24,500	NR	25,700	NR	13,500
Lead	1,000	15.7	NR	25.9	NR	43.6 J
Magnesium	NS	2,840	NR	4,030	NR	1,760
Manganese	10,000	519 J	NR	522 J	NR	340
Mercury	2.8	NR	0.029	NR	0.041	NR
Nickel	310	18	NR	22.5	NR	10.4
Potassium	NS	1,010	NR	986	NR	717
Selenium	1,500	5.3 U	NR	5 U	NR	4.9 U
Silver	1,500	1.1 U	NR	1 U	NR	0.99 U
Sodium	NS	60.8 J	NR	95.5 J	NR	160
Thallium	NS	0.43 U	NR	0.4 U	NR	0.4 U
Vanadium	NS	36.8	NR	38.7	NR	18.3
Zinc	10,000	47.6	NR	50.6	NR	38.2

	AKRF Sample ID	EP-24_1_20200226	EP-24_1_20200226	EP-X3_1_20200226	EP-X3_1_20200226	EP-25_1_20200217
Labo	ratory Sample ID	460-203752-7	460-203752-7	460-203752-8	460-203752-8	460-203168-10
	Date Sampled	2/26/2020	2/26/2020	2/26/2020	2/26/2020	2/17/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	4,740	NR	4,690	NR
Antimony	NS	NR	1.1 U	NR	1 UJ	NR
Arsenic	16	NR	1.1	NR	1.2	NR
Barium	400	NR	34.6	NR	35.1	NR
Beryllium	590	NR	0.24 J	NR	0.23 J	NR
Cadmium	9.3	NR	1.1 U	NR	1 U	NR
Calcium	NS	NR	1,420	NR	1,250 J	NR
Chromium, Hexavalent	400	2.3 U	NR	2.2 UJ	NR	2.3 U
Chromium, Total	NS	NR	11.9	NR	12	NR
Cobalt	NS	NR	4.8	NR	4.5	NR
Copper	270	NR	10.8	NR	12.9	NR
Iron	NS	NR	9,820	NR	9,970	NR
Lead	1,000	NR	7.5 J	NR	18.7 J	NR
Magnesium	NS	NR	2,170	NR	2,140	NR
Manganese	10,000	NR	155	NR	190	NR
Mercury	2.8	0.034	NR	0.044	NR	0.26 J
Nickel	310	NR	10.5	NR	10.6	NR
Potassium	NS	NR	1,050	NR	1,010	NR
Selenium	1,500	NR	5.4 U	NR	5.1 U	NR
Silver	1,500	NR	1.1 U	NR	1 U	NR
Sodium	NS	NR	145	NR	146	NR
Thallium	NS	NR	0.44 U	NR	0.4 U	NR
Vanadium	NS	NR	16	NR	16.1	NR
Zinc	10,000	NR	25.9	NR	29.2	NR

	AKRF Sample ID	EP-25_1_20200217	EP-26_1_20200217	EP-26_1_20200217	EP-27_1_20200217	EP-27_1_20200217
Labo	ratory Sample ID	460-203168-10	460-203168-13	460-203168-13	460-203168-14	460-203168-14
	Date Sampled	2/17/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	10,700	NR	9,220	NR	6,900
Antimony	NS	0.64 J	NR	1 U	NR	1.1
Arsenic	16	4.5 J	NR	3.4 J	NR	7.7 J
Barium	400	73.8 J	NR	57.6 J	NR	74.3 J
Beryllium	590	0.34 J	NR	0.4 J	NR	0.41 J
Cadmium	9.3	0.57 J	NR	0.34 J	NR	0.43 J
Calcium	NS	2,230 J	NR	1,710 J	NR	1,460 J
Chromium, Hexavalent	400	NR	2.2 U	NR	2.3 U	NR
Chromium, Total	NS	22.5	NR	19	NR	17.1
Cobalt	NS	9.3	NR	5.7	NR	6.3
Copper	270	87.2 J	NR	25.2 J	NR	144 J
Iron	NS	21,000	NR	16,300	NR	18,800
Lead	1,000	138 J	NR	50.3 J	NR	134 J
Magnesium	NS	2,030	NR	1,640	NR	1,710
Manganese	10,000	325	NR	231	NR	421
Mercury	2.8	NR	0.11 J	NR	0.45 J	NR
Nickel	310	19.2	NR	11.6	NR	14.1
Potassium	NS	688	NR	366	NR	697
Selenium	1,500	0.46 J	NR	0.38 J	NR	0.69 J
Silver	1,500	1.1 U	NR	1 U	NR	1.1 U
Sodium	NS	159	NR	80.7 J	NR	125
Thallium	NS	0.43 U	NR	0.41 U	NR	0.16 J
Vanadium	NS	29.3	NR	25.8	NR	26.1
Zinc	10,000	994 J	NR	68.7 J	NR	117 J

	AKRF Sample ID	EP-28_1_20200217	EP-28_1_20200217	EP-29_1_20200217	EP-29_1_20200217	EP-30_1_20200217
Labo	ratory Sample ID	460-203168-5	460-203168-5	460-203168-8	460-203168-8	460-203168-9
	Date Sampled	2/17/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	4,730	NR	8,040	NR
Antimony	NS	NR	0.78 J	NR	1.1	NR
Arsenic	16	NR	1.8 J	NR	5.4 J	NR
Barium	400	NR	55.7 J	NR	70.8 J	NR
Beryllium	590	NR	0.26 J	NR	0.27 J	NR
Cadmium	9.3	NR	0.37 J	NR	1.2	NR
Calcium	NS	NR	1,250 J	NR	3,420 J	NR
Chromium, Hexavalent	400	2.2 U	NR	2.4 U	NR	2.4 U
Chromium, Total	NS	NR	17	NR	19.5	NR
Cobalt	NS	NR	8	NR	6.4	NR
Copper	270	NR	101 J	NR	62.2 J	NR
Iron	NS	NR	13,800	NR	17,800	NR
Lead	1,000	NR	152 J	NR	153 J	NR
Magnesium	NS	NR	1,700	NR	1,860	NR
Manganese	10,000	NR	222	NR	293	NR
Mercury	2.8	0.064 J	NR	0.3 J	NR	0.22 J
Nickel	310	NR	19.2	NR	20.1	NR
Potassium	NS	NR	727	NR	677	NR
Selenium	1,500	NR	5 U	NR	0.33 J	NR
Silver	1,500	NR	1 U	NR	1.1 U	NR
Sodium	NS	NR	121	NR	135	NR
Thallium	NS	NR	0.4 U	NR	0.45 U	NR
Vanadium	NS	NR	17.2	NR	24.9	NR
Zinc	10,000	NR	796 J	NR	266 J	NR

	AKRF Sample ID	EP-30_1_20200217	EP-31_1_20200217	EP-31_1_20200217	EP-32_1_20200217	EP-32_1_20200217
Labo	ratory Sample ID	460-203168-9	460-203168-12	460-203168-12	460-203168-4	460-203168-4
	Date Sampled	2/17/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	10,600	NR	6,560	NR	5,290
Antimony	NS	0.4 J	NR	1.1	NR	0.91 J
Arsenic	16	4.5 J	NR	6.9 J	NR	3.1 J
Barium	400	74.5 J	NR	66.1 J	NR	150 J
Beryllium	590	0.48	NR	0.4 J	NR	0.34 J
Cadmium	9.3	0.45 J	NR	1.1 U	NR	1.7
Calcium	NS	1,420 J	NR	1,280 J	NR	3,080 J
Chromium, Hexavalent	400	NR	2.3 U	NR	2.2 U	NR
Chromium, Total	NS	18.7	NR	17.1	NR	18.6
Cobalt	NS	6.1	NR	5.6	NR	5.5
Copper	270	51.6 J	NR	119 J	NR	91.8 J
Iron	NS	17,100	NR	16,600	NR	19,000
Lead	1,000	102 J	NR	212 J	NR	233 J
Magnesium	NS	1,730	NR	1,570	NR	1,430
Manganese	10,000	391	NR	383	NR	268
Mercury	2.8	NR	0.44 J	NR	0.65 J	NR
Nickel	310	13.5	NR	12.3	NR	17.8
Potassium	NS	469	NR	712	NR	656
Selenium	1,500	0.6 J	NR	0.97 J	NR	5.2 U
Silver	1,500	1.2 U	NR	1.1 U	NR	1 U
Sodium	NS	146	NR	98.6 J	NR	113
Thallium	NS	0.47 U	NR	0.13 J	NR	0.41 U
Vanadium	NS	29.4	NR	23.4	NR	18.8
Zinc	10,000	91.8 J	NR	108 J	NR	629 J

	AKRF Sample ID	EP-X2_1_20200217	EP-X2_1_20200217	EP-33_1_20200217	EP-33_1_20200217	EP-34_1_20200217
Labo	ratory Sample ID	460-203168-6	460-203168-6	460-203168-3	460-203168-3	460-203168-7
	Date Sampled	2/17/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	4,380	NR	4,360	NR
Antimony	NS	NR	0.31 J	NR	1 U	NR
Arsenic	16	NR	1.4 J	NR	1.2 J	NR
Barium	400	NR	32.8 J	NR	34.6 J	NR
Beryllium	590	NR	0.21 J	NR	0.25 J	NR
Cadmium	9.3	NR	0.36 J	NR	1 U	NR
Calcium	NS	NR	1,250 J	NR	814 J	NR
Chromium, Hexavalent	400	2.2 U	NR	2.3 U	NR	2.4 U
Chromium, Total	NS	NR	12.3	NR	13	NR
Cobalt	NS	NR	5.5	NR	5.7	NR
Copper	270	NR	24.8 J	NR	20.7 J	NR
Iron	NS	NR	11,800	NR	10,000	NR
Lead	1,000	NR	28.9 J	NR	19.4 J	NR
Magnesium	NS	NR	1,730	NR	1,840	NR
Manganese	10,000	NR	248	NR	165	NR
Mercury	2.8	0.063 J	NR	0.025 J	NR	0.15 J
Nickel	310	NR	12.7	NR	12.5	NR
Potassium	NS	NR	778	NR	809	NR
Selenium	1,500	NR	5 U	NR	5.1 U	NR
Silver	1,500	NR	1 U	NR	1 U	NR
Sodium	NS	NR	91.2 J	NR	73.6 J	NR
Thallium	NS	NR	0.4 U	NR	0.41 U	NR
Vanadium	NS	NR	17.3	NR	16.6	NR
Zinc	10,000	NR	123 J	NR	126 J	NR

	AKRF Sample ID	EP-34_1_20200217	EP-35_1_20200203	EP-35_1_20200203	EP-36_1_20200204	EP-36_1_20200204
Labo	ratory Sample ID	460-203168-7	460-202180-7	460-202180-7	460-202292-7	460-202292-7
	Date Sampled	2/17/2020	2/03/2020	2/03/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	5,000	NR	9,210	NR	7,200
Antimony	NS	1.2 U	NR	0.94 U	NR	0.57 J
Arsenic	16	1.2 J	NR	5.6	NR	5.7
Barium	400	47.3 J	NR	59.8	NR	69.7
Beryllium	590	0.22 J	NR	0.4	NR	0.4
Cadmium	9.3	1.2 U	NR	0.54 J	NR	0.67 J
Calcium	NS	1,240 J	NR	1,250	NR	1,500
Chromium, Hexavalent	400	NR	2.3 UJ	NR	2.2 U	NR
Chromium, Total	NS	15.1	NR	19.1	NR	16.9
Cobalt	NS	5.4	NR	6.2	NR	5.5
Copper	270	20 J	NR	48.5	NR	72.9
Iron	NS	11,600	NR	20,000	NR	16,800
Lead	1,000	27 J	NR	105 J	NR	177
Magnesium	NS	2,210	NR	1,740	NR	1,520
Manganese	10,000	114	NR	348	NR	280
Mercury	2.8	NR	0.41 J	NR	0.35	NR
Nickel	310	11.8	NR	13.5	NR	13.8
Potassium	NS	963	NR	673	NR	638
Selenium	1,500	6 U	NR	0.34 J	NR	0.38 J
Silver	1,500	1.2 U	NR	0.94 U	NR	0.97 U
Sodium	NS	93.8 J	NR	93.4 J	NR	102
Thallium	NS	0.48 U	NR	0.38 U	NR	0.39 U
Vanadium	NS	20.2	NR	36.9	NR	22.2
Zinc	10,000	35.5 J	NR	130	NR	202

	AKRF Sample ID	EP-37_1_20200204	EP-37_1_20200204	EP-38_1_20200204	EP-38_1_20200204	EP-39_1_20200204
Labo	ratory Sample ID	460-202292-8	460-202292-8	460-202292-9	460-202292-9	460-202292-10
	Date Sampled	2/04/2020	2/04/2020	2/04/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	6,870	NR	6,580	NR
Antimony	NS	NR	0.85 J	NR	0.6 J	NR
Arsenic	16	NR	4.7	NR	3.7	NR
Barium	400	NR	73.8	NR	72.3	NR
Beryllium	590	NR	0.4 J	NR	0.39 J	NR
Cadmium	9.3	NR	0.74 J	NR	1.1	NR
Calcium	NS	NR	3,690	NR	3,330	NR
Chromium, Hexavalent	400	2.2 U	NR	2.2 U	NR	2.3 U
Chromium, Total	NS	NR	18.2	NR	18.6	NR
Cobalt	NS	NR	6.8	NR	6.9	NR
Copper	270	NR	84.5	NR	76.3	NR
Iron	NS	NR	17,100	NR	17,300	NR
Lead	1,000	NR	168	NR	163	NR
Magnesium	NS	NR	1,660	NR	1,650	NR
Manganese	10,000	NR	298	NR	318	NR
Mercury	2.8	0.57	NR	0.62	NR	0.56
Nickel	310	NR	16.5	NR	17	NR
Potassium	NS	NR	694	NR	768	NR
Selenium	1,500	NR	0.44 J	NR	5 U	NR
Silver	1,500	NR	1 U	NR	1 U	NR
Sodium	NS	NR	158	NR	155	NR
Thallium	NS	NR	0.41 U	NR	0.4 U	NR
Vanadium	NS	NR	23.4	NR	21.7	NR
Zinc	10,000	NR	442	NR	437	NR

	AKRF Sample ID	EP-39_1_20200204	EP-40_1_20200204	EP-40_1_20200204	EP-41_1_20200203	EP-41_1_20200203
Labo	ratory Sample ID	460-202292-10	460-202292-11	460-202292-11	460-202180-2	460-202180-2
	Date Sampled	2/04/2020	2/04/2020	2/04/2020	2/03/2020	2/03/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	6,300	NR	5,750	NR	6,380
Antimony	NS	0.5 J	NR	0.46 J	NR	1 U
Arsenic	16	5.6	NR	3.7	NR	3.8
Barium	400	63.4	NR	86.4	NR	49.1
Beryllium	590	0.42	NR	0.35 J	NR	0.36 J
Cadmium	9.3	1.1 U	NR	0.97 J	NR	1 UJ
Calcium	NS	1,130	NR	776	NR	1,400
Chromium, Hexavalent	400	NR	2.2 U	NR	2.3 UJ	NR
Chromium, Total	NS	20.6	NR	18.1	NR	17.4
Cobalt	NS	5.9	NR	5.2	NR	4.8
Copper	270	57.1	NR	69.3	NR	24.2
Iron	NS	23,500	NR	15,100	NR	18,600
Lead	1,000	100	NR	178	NR	68.9 J
Magnesium	NS	1,540	NR	1,340	NR	1,290
Manganese	10,000	417	NR	172	NR	360
Mercury	2.8	NR	0.46	NR	0.26 J	NR
Nickel	310	11.7	NR	15.1	NR	9.9
Potassium	NS	784	NR	592	NR	627
Selenium	1,500	0.45 J	NR	5.2 U	NR	0.31 J
Silver	1,500	1.1 U	NR	1 U	NR	1 U
Sodium	NS	84.5 J	NR	47.4 J	NR	53.1 J
Thallium	NS	0.42 U	NR	0.41 U	NR	0.4 U
Vanadium	NS	25.8	NR	21.5	NR	20.1
Zinc	10,000	86.4	NR	150	NR	83.3

AKRF Sample ID		EP-42_1_20200203	EP-42_1_20200203	EP-42_1_20200203	EP-X1_1_20200203	EP-X1_1_20200203
Laboratory Sample ID		460-202180-3	460-202180-3	460-202180-3	460-202180-6	460-202180-6
	Date Sampled	2/03/2020	2/03/2020	2/03/2020	2/03/2020	2/03/2020
Dilution Factor		1	2	10	1	10
Unit		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	NR	7,170	NR	7,580
Antimony	NS	NR	NR	0.68 J	NR	0.36 J
Arsenic	16	NR	NR	5.7 H	NR	5.8 H
Barium	400	NR	NR	77	NR	71.4
Beryllium	590	NR	NR	0.41 J	NR	0.49
Cadmium	9.3	NR	NR	1.8 J	NR	0.58 J
Calcium	NS	NR	NR	1,970 L	NR	1,990 L
Chromium, Hexavalent	400	2.3 UJ	NR	NR	2.5 UJ	NR
Chromium, Total	NS	NR	NR	32.8 J	NR	21.2 J
Cobalt	NS	NR	NR	6.1 H	NR	5.9 H
Copper	270	NR	NR	68.7 J	NR	41.5 J
Iron	NS	NR	NR	21,200	NR	30,000
Lead	1,000	NR	NR	357 J	NR	107 J
Magnesium	NS	NR	NR	1,560 H	NR	1,970 H
Manganese	10,000	NR	NR	330	NR	548
Mercury	2.8	NR	0.88 J	NR	0.25 J	NR
Nickel	310	NR	NR	18.2 H	NR	15.6 H
Potassium	NS	NR	NR	762	NR	742
Selenium	1,500	NR	NR	0.33 J	NR	0.52 J
Silver	1,500	NR	NR	1.1 U	NR	1.2 U
Sodium	NS	NR	NR	76.4 J	NR	61.3 J
Thallium	NS	NR	NR	0.44 U	NR	0.47 U
Vanadium	NS	NR	NR	24.8 H	NR	26.3 H
Zinc	10,000	NR	NR	211 J	NR	194 J
	AKRF Sample ID	EP-43_1_20200204	EP-43_1_20200204	EP-44_1_20200204	EP-44_1_20200204	EP-45_1_20200204
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Labo	ratory Sample ID	460-202292-3	460-202292-3	460-202292-4	460-202292-4	460-202292-5
	Date Sampled	2/04/2020	2/04/2020	2/04/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	6,500	NR	7,470	NR
Antimony	NS	NR	0.47 J	NR	1.1 U	NR
Arsenic	16	NR	4.4	NR	2.7	NR
Barium	400	NR	61.1	NR	48.2	NR
Beryllium	590	NR	0.4 J	NR	0.38 J	NR
Cadmium	9.3	NR	0.52 J	NR	1.1 U	NR
Calcium	NS	NR	1,340	NR	1,120	NR
Chromium, Hexavalent	400	2.3 U	NR	2.2 U	NR	2.2 U
Chromium, Total	NS	NR	16.5	NR	14.6	NR
Cobalt	NS	NR	5.5	NR	6.5	NR
Copper	270	NR	104	NR	24.1	NR
Iron	NS	NR	16,000	NR	14,600	NR
Lead	1,000	NR	122	NR	57.2	NR
Magnesium	NS	NR	1,520	NR	1,430	NR
Manganese	10,000	NR	330	NR	349	NR
Mercury	2.8	0.66	NR	0.2	NR	0.27
Nickel	310	NR	12.8	NR	11.3	NR
Potassium	NS	NR	623	NR	502	NR
Selenium	1,500	NR	0.53 J	NR	5.5 U	NR
Silver	1,500	NR	1 U	NR	1.1 U	NR
Sodium	NS	NR	80.7 J	NR	141	NR
Thallium	NS	NR	0.41 U	NR	0.44 U	NR
Vanadium	NS	NR	22.5	NR	20.2	NR
Zinc	10,000	NR	113	NR	110	NR

	AKRF Sample ID	EP-45_1_20200204	EP-46_1_20200203	EP-46_1_20200203	EP-47_1_20200204	EP-47_1_20200204
Labo	ratory Sample ID	460-202292-5	460-202180-1	460-202180-1	460-202292-2	460-202292-2
	Date Sampled	2/04/2020	2/03/2020	2/03/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	6,880	NR	8,440	NR	7,730
Antimony	NS	1 J	NR	1 U	NR	1.1 U
Arsenic	16	6.7	NR	3.8	NR	3.2
Barium	400	65.9	NR	65.4	NR	48.4
Beryllium	590	0.62	NR	0.52	NR	0.53
Cadmium	9.3	0.59 J	NR	0.42 J	NR	0.43 J
Calcium	NS	943	NR	1,360	NR	728
Chromium, Hexavalent	400	NR	2.3 UJ	NR	2.3 U	NR
Chromium, Total	NS	24.1	NR	18.1	NR	16.3
Cobalt	NS	7.7	NR	5.6	NR	6.9
Copper	270	41	NR	40.8	NR	25.6
Iron	NS	35,600	NR	24,300	NR	18,900
Lead	1,000	79.5	NR	66.4 J	NR	46.3
Magnesium	NS	1,770	NR	1,880	NR	1,940
Manganese	10,000	534	NR	328	NR	449
Mercury	2.8	NR	0.23 J	NR	0.29	NR
Nickel	310	16	NR	12.4	NR	15.5
Potassium	NS	864	NR	715	NR	786
Selenium	1,500	0.36 J	NR	0.36 J	NR	5.3 U
Silver	1,500	1.1 U	NR	1 U	NR	1.1 U
Sodium	NS	80.5 J	NR	149	NR	53.6 J
Thallium	NS	0.43 U	NR	0.41 U	NR	0.42 U
Vanadium	NS	33.6	NR	27.9	NR	26.5
Zinc	10,000	149	NR	155	NR	137

	AKRF Sample ID	EP-48_1_20200204	EP-48_1_20200204	EP-48_1_20200204	EP-49_7_20200226	EP-49_7_20200226
Labo	ratory Sample ID	460-202292-1	460-202292-1	460-202292-1	460-203752-6	460-203752-6
	Date Sampled	2/04/2020	2/04/2020	2/04/2020	2/26/2020	2/26/2020
	<b>Dilution Factor</b>	1	5	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	NR	7,440	NR	27,400
Antimony	NS	NR	NR	0.3 J	NR	1.5 U
Arsenic	16	NR	NR	3.8	NR	5.7
Barium	400	NR	NR	62.7	NR	144
Beryllium	590	NR	NR	0.45	NR	1.3
Cadmium	9.3	NR	NR	0.62 J	NR	1.5 U
Calcium	NS	NR	NR	1,530	NR	2,430
Chromium, Hexavalent	400	2.3 U	NR	NR	3.3 U	NR
Chromium, Total	NS	NR	NR	15	NR	39.6
Cobalt	NS	NR	NR	5.2	NR	11.7
Copper	270	NR	NR	24.2	NR	37.4
Iron	NS	NR	NR	15,000	NR	30,400
Lead	1,000	NR	NR	120	NR	98.7 J
Magnesium	NS	NR	NR	1,510	NR	3,740
Manganese	10,000	NR	NR	275	NR	375
Mercury	2.8	NR	1.7	NR	0.19	NR
Nickel	310	NR	NR	16.5	NR	26.2
Potassium	NS	NR	NR	743	NR	1,410
Selenium	1,500	NR	NR	0.3 J	NR	0.79 J
Silver	1,500	NR	NR	1 U	NR	1.5 U
Sodium	NS	NR	NR	166	NR	298
Thallium	NS	NR	NR	0.4 U	NR	0.25 J
Vanadium	NS	NR	NR	22.4	NR	52.8
Zinc	10,000	NR	NR	115	NR	75.6

	AKRF Sample ID	SW-01_4_20200226	SW-01_4_20200226	SW-02_4_20200226	SW-02_4_20200226	SW-03_4_20200226
Labo	ratory Sample ID	460-203752-2	460-203752-2	460-203752-3	460-203752-3	460-203752-4
	Date Sampled	2/26/2020	2/26/2020	2/26/2020	2/26/2020	2/26/2020
	<b>Dilution Factor</b>	1	10	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	NR	12,600	NR	12,600	NR
Antimony	NS	NR	1.3	NR	1.8	NR
Arsenic	16	NR	6.7	NR	6.7	NR
Barium	400	NR	117	NR	92.7	NR
Beryllium	590	NR	0.66	NR	0.69	NR
Cadmium	9.3	NR	0.45 J	NR	1.2 U	NR
Calcium	NS	NR	2,060	NR	2,160	NR
Chromium, Hexavalent	400	2.6 U	NR	2.6 U	NR	2.5 U
Chromium, Total	NS	NR	30	NR	23.2	NR
Cobalt	NS	NR	7.5	NR	7.5	NR
Copper	270	NR	59.4	NR	49.4	NR
Iron	NS	NR	20,500	NR	21,800	NR
Lead	1,000	NR	146	NR	101	NR
Magnesium	NS	NR	2,150	NR	2,020	NR
Manganese	10,000	NR	307	NR	698	NR
Mercury	2.8	0.4	NR	0.5	NR	0.45
Nickel	310	NR	15.4	NR	14.1	NR
Potassium	NS	NR	800	NR	662	NR
Selenium	1,500	NR	0.57 J	NR	0.63 J	NR
Silver	1,500	NR	1.2 U	NR	1.2 U	NR
Sodium	NS	NR	185	NR	156	NR
Thallium	NS	NR	0.15 J	NR	0.48 U	NR
Vanadium	NS	NR	30.2	NR	31.3	NR
Zinc	10,000	NR	216	NR	72.2	NR

	AKRF Sample ID	SW-03_4_20200226	SW-04_4_20200226	SW-04_4_20200226	SW-04_3_20200501	SW-04_3_20200501
Labo	ratory Sample ID	460-203752-4	460-203752-5	460-203752-5	460-208010-6	460-208010-6
	Date Sampled	2/26/2020	2/26/2020	2/26/2020	5/01/2020	5/01/2020
	<b>Dilution Factor</b>	10	1	10	1	10
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aluminum	NS	14,700	NR	8,160	NR	13,000
Antimony	NS	0.6 J	NR	1.2	NR	0.34 J
Arsenic	16	6.9	NR	7.2	NR	4.6
Barium	400	95.6	NR	187	NR	128
Beryllium	590	0.75	NR	0.48	NR	0.58
Cadmium	9.3	1.2 U	NR	5.4	NR	0.44 J
Calcium	NS	2,720	NR	10,900	NR	2,370
Chromium, Hexavalent	400	NR	2.6 U	NR	2.5 U	NR
Chromium, Total	NS	24	NR	31.6	NR	28.2
Cobalt	NS	8.3	NR	8.7	NR	8.3
Copper	270	48.1	NR	189	NR	927
Iron	NS	22,400	NR	27,200	NR	22,400
Lead	1,000	111	NR	405	NR	73.8
Magnesium	NS	2,360	NR	2,250	NR	2,500
Manganese	10,000	546	NR	311	NR	361 J
Mercury	2.8	NR	0.32	NR	0.19	NR
Nickel	310	16.9	NR	44.4	NR	18.4
Potassium	NS	898	NR	820	NR	812
Selenium	1,500	0.73 J	NR	0.62 J	NR	0.58 J
Silver	1,500	1.2 U	NR	1.2 U	NR	1.1 U
Sodium	NS	225	NR	222	NR	77.1 J
Thallium	NS	0.16 J	NR	0.48 U	NR	0.46 U
Vanadium	NS	31.4	NR	31.6	NR	33.9
Zinc	10,000	97.3	NR	831	NR	121

	AKRF Sample ID	SW-04_4_20200612	FB-1_20200203	FB-1_20200204	FB-1_20200204	FB-2_20200217
Labo	ratory Sample ID	460-210991-8	460-202180-5	460-202292-6	460-202292-6	460-203168-2
	Date Sampled	6/12/2020	2/03/2020	2/04/2020	2/04/2020	2/17/2020
	<b>Dilution Factor</b>	10	1	1	2	1
	Unit	mg/kg	µg/L	µg/L	µg/L	μg/L
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	NR	NR	NR	40 U	NR
Antimony	NS	NR	NR	NR	0.65 J	NR
Arsenic	16	NR	NR	NR	2 U	NR
Barium	400	NR	NR	NR	4 U	NR
Beryllium	590	NR	NR	NR	0.8 U	NR
Cadmium	9.3	NR	NR	NR	2 U	NR
Calcium	NS	NR	NR	NR	200 U	NR
Chromium, Hexavalent	400	NR	10 U	NR	NR	10 R
Chromium, Total	NS	NR	NR	NR	4 U	NR
Cobalt	NS	NR	NR	NR	4 U	NR
Copper	270	48.7	NR	NR	4 U	NR
Iron	NS	NR	NR	NR	120 U	NR
Lead	1,000	NR	NR	NR	1.2 U	NR
Magnesium	NS	NR	NR	NR	200 U	NR
Manganese	10,000	NR	NR	NR	8 U	NR
Mercury	2.8	NR	NR	0.2 U	NR	0.2 U
Nickel	310	NR	NR	NR	4 U	NR
Potassium	NS	NR	NR	NR	200 U	NR
Selenium	1,500	NR	NR	NR	10 U	NR
Silver	1,500	NR	NR	NR	2 U	NR
Sodium	NS	NR	NR	NR	200 U	NR
Thallium	NS	NR	NR	NR	0.8 U	NR
Vanadium	NS	NR	NR	NR	4 U	NR
Zinc	10,000	NR	NR	NR	16 U	NR

	AKRF Sample ID	FB-2_20200217	FB-03_20200226	FB-03_20200226	EP-FB-04_20200501	EP-FB-04_20200501
Labo	ratory Sample ID	460-203168-2	460-203752-10	460-203752-10	460-208010-9	460-208010-9
	Date Sampled	2/17/2020	2/26/2020	2/26/2020	5/01/2020	5/01/2020
	<b>Dilution Factor</b>	2	1	2	1	2
	Unit	μg/L	µg/L	μg/L	μg/L	μg/L
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aluminum	NS	40 U	NR	40 U	NR	40 U
Antimony	NS	2 U	NR	2 U	NR	2 U
Arsenic	16	2 U	NR	2 U	NR	2 U
Barium	400	4 U	NR	4 U	NR	6
Beryllium	590	0.8 U	NR	0.8 U	NR	0.8 U
Cadmium	9.3	2 U	NR	2 U	NR	2 U
Calcium	NS	200 U	NR	200 U	NR	200 U
Chromium, Hexavalent	400	NR	10 U	NR	10 U	NR
Chromium, Total	NS	4 U	NR	4 U	NR	4 U
Cobalt	NS	4 U	NR	4 U	NR	4 U
Copper	270	4 U	NR	4 U	NR	4 U
Iron	NS	120 U	NR	120 U	NR	120 U
Lead	1,000	1.2 U	NR	1.2 U	NR	1.2 U
Magnesium	NS	200 U	NR	200 U	NR	200 U
Manganese	10,000	8 U	NR	8 U	NR	8 U
Mercury	2.8	NR	0.2 U	NR	0.2 U	NR
Nickel	310	4 U	NR	4 U	NR	4 U
Potassium	NS	200 U	NR	200 U	NR	200 U
Selenium	1,500	10 U	NR	10 U	NR	10 U
Silver	1,500	2 U	NR	2 U	NR	2 U
Sodium	NS	200 U	NR	200 U	NR	682
Thallium	NS	0.8 U	NR	0.8 U	NR	0.8 U
Vanadium	NS	4 U	NR	4 U	NR	4 U
Zinc	10,000	16 U	NR	16 U	NR	16 U

#### Soil Analytical Results of Polychlorinated Biphenyls (PCBs)

	AKRF Sample ID	EP-01_1_20200618	EP-02_1_20200618	EP-03_1_20200618	EP-04_1_20200616	EP-X6_1_20200616
Labo	oratory Sample ID	460-211428-1	460-211428-4	460-211428-9	460-211215-1	460-211215-2
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/16/2020	6/16/2020
	<b>Dilution Factor</b>	1	1	1	2	2
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.074 U	0.072 U	0.077 U	0.16 U	NR
PCB-1221 (Aroclor 1221)	NS	0.074 U	0.072 U	0.077 U	0.16 U	0.16 U
PCB-1232 (Aroclor 1232)	NS	0.074 U	0.072 U	0.077 U	0.16 U	NR
PCB-1242 (Aroclor 1242)	NS	0.074 U	0.072 U	0.2	2	NR
PCB-1248 (Aroclor 1248)	NS	0.074 U	0.62	0.077 U	0.16 U	NR
PCB-1254 (Aroclor 1254)	NS	0.074 U	0.072 U	0.077 U	0.16 U	NR
PCB-1260 (Aroclor 1260)	NS	0.061 J	0.25	0.079	0.29	NR
PCB-1262 (Aroclor 1262)	NS	0.074 U	0.072 U	0.077 U	0.16 U	NR
PCB-1268 (Aroclor 1268)	NS	0.074 U	0.072 U	0.077 U	0.16 U	NR
Total PCBs	1	0.061 J	0.87	0.28	2.3	NR

	AKRF Sample ID	EP-05_1_20200618	EP-06_1_20200618	EP-07_1_20200618	EP-08_1_20200618	EP-09_1_20200618
Labo	oratory Sample ID	460-211428-2	460-211428-5	460-211428-7	460-211428-3	460-211428-6
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
PCB-1221 (Aroclor 1221)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
PCB-1232 (Aroclor 1232)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
PCB-1242 (Aroclor 1242)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
PCB-1248 (Aroclor 1248)	NS	0.26	0.26	0.59	0.053 J	0.27
PCB-1254 (Aroclor 1254)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
PCB-1260 (Aroclor 1260)	NS	0.055 J	0.11	0.54	0.069 U	0.14
PCB-1262 (Aroclor 1262)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
PCB-1268 (Aroclor 1268)	NS	0.072 U	0.075 U	0.074 U	0.069 U	0.072 U
Total PCBs	1	0.32	0.37	1.1	0.053 J	0.41

	AKRF Sample ID	EP-10_1_20200618	EP-11_1_20200618	EP-12_1_20200612	EP-13_1_20200612	EP-X5_1_20200612
Labo	oratory Sample ID	460-211428-8	460-211428-10	460-210991-4	460-210991-5	460-210991-6
	Date Sampled	6/18/2020	6/18/2020	6/12/2020	6/12/2020	6/12/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.069 U	0.073 U	0.076 U	0.08 U	NR
PCB-1221 (Aroclor 1221)	NS	0.069 U	0.073 U	0.076 U	0.08 U	0.08 U
PCB-1232 (Aroclor 1232)	NS	0.069 U	0.073 U	0.076 U	0.08 U	NR
PCB-1242 (Aroclor 1242)	NS	0.96	0.32	1.1	0.9 J	NR
PCB-1248 (Aroclor 1248)	NS	0.069 U	0.073 U	0.076 U	0.08 U	NR
PCB-1254 (Aroclor 1254)	NS	0.069 U	0.073 U	0.076 U	0.08 U	NR
PCB-1260 (Aroclor 1260)	NS	0.3	0.11	0.32	0.15 J	NR
PCB-1262 (Aroclor 1262)	NS	0.069 U	0.073 U	0.076 U	0.08 U	NR
PCB-1268 (Aroclor 1268)	NS	0.069 U	0.073 U	0.076 U	0.08 U	NR
Total PCBs	1	1.3	0.43	1.4	1.1 J	NR

Soil Analytic	cal Results	of Polyc	hlorinated B	iphenyls	(PCBs)
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AKRF Sample ID Laboratory Sample ID		EP-14_1_20200501 460-208010-1	EP-X04_1_20200501 460-208010-7	EP-15_1_20200501 460-208010-2	EP-16_1_20200501 460-208010-3	EP-17_1_20200612 460-210991-1
	Date Sampled Dilution Factor	5/01/2020 1	5/01/2020 1	5/01/2020 1	5/01/2020 1	6/12/2020 1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
PCB-1221 (Aroclor 1221)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
PCB-1232 (Aroclor 1232)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
PCB-1242 (Aroclor 1242)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.68
PCB-1248 (Aroclor 1248)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
PCB-1254 (Aroclor 1254)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
PCB-1260 (Aroclor 1260)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.21
PCB-1262 (Aroclor 1262)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
PCB-1268 (Aroclor 1268)	NS	0.077 U	0.077 U	0.079 U	0.075 U	0.072 U
Total PCBs	1	0.077 U	0.077 U	0.079 U	0.075 U	0.89

#### Soil Analytical Results of Polychlorinated Biphenyls (PCBs)

AKRF Sample ID Laboratory Sample ID Date Sampled Dilution Factor		EP-18_1_20200612 460-210991-2 6/12/2020 1	EP-19_1_20200612 460-210991-3 6/12/2020 1	EP-20_1_20200217 460-203168-11 2/17/2020 1	EP-21_1_20200501 460-208010-4 5/01/2020 1	EP-22_1_20200501 460-208010-5 5/01/2020 1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	0.077 U	0.074 U	0.074 U	0.074 U	0.075 U
PCB-1221 (Aroclor 1221)	NS	0.077 U	0.074 U	0.074 U	0.074 U	0.075 U
PCB-1232 (Aroclor 1232)	NS	0.077 U	0.074 U	0.074 U	0.074 U	0.075 U
PCB-1242 (Aroclor 1242)	NS	0.2	0.25	0.074 UJ	0.074 U	0.075 U
PCB-1248 (Aroclor 1248)	NS	0.077 U	0.074 U	0.062 J	0.074 U	0.075 U
PCB-1254 (Aroclor 1254)	NS	0.077 U	0.074 U	0.074 U	0.074 U	0.075 U
PCB-1260 (Aroclor 1260)	NS	0.077 U	0.18	0.074 UJ	0.074 U	0.075 U
PCB-1262 (Aroclor 1262)	NS	0.077 U	0.074 U	0.074 U	0.074 U	0.075 U
PCB-1268 (Aroclor 1268)	NS	0.077 U	0.074 U	0.074 U	0.074 U	0.075 U
Total PCBs	1	0.2	0.43	0.062 J	0.074 U	0.075 U

Soil Analytical	Results of Po	lychlorinated	<b>Biphenyls</b> (PCBs)	
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	AKRF Sample ID	EP-23_1_20200226	EP-24_1_20200226	EP-X3_1_20200226	EP-25_1_20200217	EP-26_1_20200217
Labo	ratory Sample ID	460-203752-9	460-203752-7	460-203752-8	460-203168-10	460-203168-13
	Date Sampled	2/26/2020	2/26/2020	2/26/2020	2/17/2020	2/17/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
PCB-1221 (Aroclor 1221)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
PCB-1232 (Aroclor 1232)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
PCB-1242 (Aroclor 1242)	NS	0.073 U	0.076 U	0.075 U	0.075 J	0.08 J
PCB-1248 (Aroclor 1248)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
PCB-1254 (Aroclor 1254)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
PCB-1260 (Aroclor 1260)	NS	0.073 U	0.076 U	0.075 U	0.076 UJ	0.074 UJ
PCB-1262 (Aroclor 1262)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
PCB-1268 (Aroclor 1268)	NS	0.073 U	0.076 U	0.075 U	0.076 U	0.074 U
Total PCBs	1	0.073 U	0.076 U	0.075 U	0.075 J	0.08 J

Soil Anal	ytical	Results	of Pol	ychlorinated	Biphen	yls	(PCBs)	)
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AKRF Sample ID Laboratory Sample ID Date Sampled Dilution Factor		EP-27_1_20200217 460-203168-14 2/17/2020 1	EP-28_1_20200217 460-203168-5 2/17/2020 1	EP-29_1_20200217 460-203168-8 2/17/2020 1	EP-30_1_20200217 460-203168-9 2/17/2020 1	EP-31_1_20200217 460-203168-12 2/17/2020 1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	0.078 U	0.073 U	0.079 U	0.08 U	0.078 U
PCB-1221 (Aroclor 1221)	NS	0.078 U	0.073 U	0.079 U	0.08 U	0.078 U
PCB-1232 (Aroclor 1232)	NS	0.078 U	0.073 U	0.079 U	0.08 U	0.078 U
PCB-1242 (Aroclor 1242)	NS	0.078 UJ	0.24 J	0.23 J	0.08 UJ	0.078 UJ
PCB-1248 (Aroclor 1248)	NS	0.33	0.073 U	0.079 U	0.08 U	0.078 U
PCB-1254 (Aroclor 1254)	NS	0.078 U	0.073 U	0.079 U	0.08 U	0.078 U
PCB-1260 (Aroclor 1260)	NS	0.81 J	0.048 J	0.093 J	0.08 UJ	0.078 UJ
PCB-1262 (Aroclor 1262)	NS	0.078 U	0.073 U	0.079 U	0.08 U	0.078 U
PCB-1268 (Aroclor 1268)	NS	0.078 U	0.073 U	0.079 U	0.08 U	0.078 U
Total PCBs	1	1.1 J	0.29 J	0.32 J	0.08 UJ	0.078 UJ

Soil Analytical	Results of Pol	lychlorinated Bi	iphenyls (	(PCBs)
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Labo	AKRF Sample ID	EP-32_1_20200217 460-203168-4	EP-X2_1_20200217 460-203168-6	EP-33_1_20200217 460-203168-3	EP-34_1_20200217 460-203168-7	EP-35_1_20200203 460-202180-7
Laso	Date Sampled	2/17/2020	2/17/2020	2/17/2020	2/17/2020	2/03/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 U
PCB-1221 (Aroclor 1221)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 U
PCB-1232 (Aroclor 1232)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 U
PCB-1242 (Aroclor 1242)	NS	0.3 J	0.16 J	0.22 J	0.08 UJ	0.077 U
PCB-1248 (Aroclor 1248)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 UJ
PCB-1254 (Aroclor 1254)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 U
PCB-1260 (Aroclor 1260)	NS	0.15 J	0.072 UJ	0.075 UJ	0.08 UJ	0.077 UJ
PCB-1262 (Aroclor 1262)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 U
PCB-1268 (Aroclor 1268)	NS	0.074 U	0.072 U	0.075 U	0.08 U	0.077 U
Total PCBs	1	0.45 J	0.16 J	0.22 J	0.08 UJ	0.077 UJ

Soil Analytical	Results	of Pol	ychlorinated	Biphen	yls	(PCBs)
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Labo	AKRF Sample ID	EP-36_1_20200204 460-202292-7	EP-37_1_20200204 460-202292-8	EP-38_1_20200204 460-202292-9	EP-39_1_20200204 460-202292-10	EP-40_1_20200204 460-202292-11
Lubo	Date Sampled	2/04/2020	2/04/2020	2/04/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1221 (Aroclor 1221)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1232 (Aroclor 1232)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1242 (Aroclor 1242)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1248 (Aroclor 1248)	NS	0.074 U	0.074 U	0.094	0.076 U	0.075 U
PCB-1254 (Aroclor 1254)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1260 (Aroclor 1260)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1262 (Aroclor 1262)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
PCB-1268 (Aroclor 1268)	NS	0.074 U	0.074 U	0.074 U	0.076 U	0.075 U
Total PCBs	1	0.074 U	0.074 U	0.094	0.076 U	0.075 U

AKRF Sample ID		EP-41_1_20200203	EP-42_1_20200203	EP-X1_1_20200203	EP-43_1_20200204	EP-44_1_20200204
Labo	ratory Sample ID	460-202180-2	460-202180-3	460-202180-6	460-202292-3	460-202292-4
	Date Sampled	2/03/2020	2/03/2020	2/03/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
PCB-1221 (Aroclor 1221)	NS	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
PCB-1232 (Aroclor 1232)	NS	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
PCB-1242 (Aroclor 1242)	NS	0.078 U	0.076 U	0.082 U	0.054 J	0.089
PCB-1248 (Aroclor 1248)	NS	0.078 UJ	0.11 J	0.082 UJ	0.075 U	0.074 U
PCB-1254 (Aroclor 1254)	NS	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
PCB-1260 (Aroclor 1260)	NS	0.078 UJ	0.091 J	0.082 UJ	0.075 U	0.074 U
PCB-1262 (Aroclor 1262)	NS	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
PCB-1268 (Aroclor 1268)	NS	0.078 U	0.076 U	0.082 U	0.075 U	0.074 U
Total PCBs	1	0.078 UJ	0.2 J	0.082 UJ	0.054 J	0.089

Soil Analytical Results of Polychlorinated Biphenyls	(PCBs)
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AKRF Sample ID		EP-45_1_20200204	EP-46_1_20200203	EP-47_1_20200204	EP-48_1_20200204	EP-49_7_20200226
Labo	oratory Sample ID	460-202292-5	460-202180-1	460-202292-2	460-202292-1	460-203752-6
	Date Sampled	2/04/2020	2/03/2020	2/04/2020	2/04/2020	2/26/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
PCB-1221 (Aroclor 1221)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
PCB-1232 (Aroclor 1232)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
PCB-1242 (Aroclor 1242)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
PCB-1248 (Aroclor 1248)	NS	0.073 U	0.076 UJ	0.076 U	0.076 U	0.11 U
PCB-1254 (Aroclor 1254)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
PCB-1260 (Aroclor 1260)	NS	0.073 U	0.076 UJ	0.076 U	0.076 U	0.11 U
PCB-1262 (Aroclor 1262)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
PCB-1268 (Aroclor 1268)	NS	0.073 U	0.076 U	0.076 U	0.076 U	0.11 U
Total PCBs	1	0.073 U	0.076 UJ	0.076 U	0.076 U	0.11 U

AKRF Sample ID		SW-01_4_20200226	SW-02_4_20200226	SW-03_4_20200226	SW-04_4_20200226	SW-04_3_20200501
Labo	ratory Sample ID	460-203752-2	460-203752-3	460-203752-4	460-203752-5	460-208010-6
	Date Sampled	2/26/2020	2/26/2020	2/26/2020	2/26/2020	5/01/2020
	<b>Dilution Factor</b>	1	1	1	10	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
PCB-1016 (Aroclor 1016)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
PCB-1221 (Aroclor 1221)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
PCB-1232 (Aroclor 1232)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
PCB-1242 (Aroclor 1242)	NS	0.088 U	0.087 U	0.13	7.9	0.59
PCB-1248 (Aroclor 1248)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
PCB-1254 (Aroclor 1254)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
PCB-1260 (Aroclor 1260)	NS	0.088 U	0.087 U	0.085 U	0.71 J	0.075 J
PCB-1262 (Aroclor 1262)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
PCB-1268 (Aroclor 1268)	NS	0.088 U	0.087 U	0.085 U	0.85 U	0.084 U
Total PCBs	1	0.088 U	0.087 U	0.13	8.6	0.67

#### Soil Analytical Results of Polychlorinated Biphenyls (PCBs)

AKRF Sample ID Laboratory Sample ID		FB-1_20200203 460-202180-5 2/03/2020	FB-2_20200217 460-203168-2 2/17/2020	FB-03_20200226 460-203752-10 2/26/2020	EP-FB-04_20200501 460-208010-9 5/01/2020
Date Sampled Dilution Factor Unit		1 1 1 μg/L μg/L μg/L		2/20/2020 1 μg/L	1 μg/L
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1221 (Aroclor 1221)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1232 (Aroclor 1232)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1242 (Aroclor 1242)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1248 (Aroclor 1248)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1254 (Aroclor 1254)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1260 (Aroclor 1260)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1262 (Aroclor 1262)	NS	0.4 U	0.4 U	0.4 U	0.4 U
PCB-1268 (Aroclor 1268)	NS	0.4 U	0.4 U	0.4 U	0.4 U
Total PCBs	1	0.4 U	0.4 U	0.4 U	0.4 U

#### Table 5 **Queens Animal Shelter and Care Center** 151 Woodward Avenue, Queens, NY

Post-Excavation Soil Endpoint Sampling Soil Analytical Results of Polychlorinated Biphenyls (PCBs)

	AKRF Sample ID	FB-04_20200612	FB-05_20200616
Labo	oratory Sample ID	460-210991-7	460-211215-3
	Date Sampled	6/12/2020	6/16/2020
	<b>Dilution Factor</b>	1	1
	Unit	μg/L	μg/L
Compound	NYSDEC CSCO	CONC Q	CONC Q
PCB-1016 (Aroclor 1016)	NS	NR	NR
PCB-1221 (Aroclor 1221)	NS	0.4 U	0.4 U
PCB-1232 (Aroclor 1232)	NS	NR	NR
PCB-1242 (Aroclor 1242)	NS	NR	NR
PCB-1248 (Aroclor 1248)	NS	NR	NR
PCB-1254 (Aroclor 1254)	NS	NR	NR
PCB-1260 (Aroclor 1260)	NS	NR	NR
PCB-1262 (Aroclor 1262) NS		NR	NR
PCB-1268 (Aroclor 1268)	NS	NR	NR
Total PCBs	1	NR	NR

	AKRF Sample ID	EP-01_1_20200618	EP-02_1_20200618	EP-03_1_20200618	EP-04_1_20200616	EP-05_1_20200618
Labo	ratory Sample ID	460-211428-1	460-211428-4	460-211428-9	460-211215-1	460-211428-2
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/16/2020	6/18/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aldrin	0.68	0.0074 U	0.0072 U	0.0077 U	0.0078 UJ	0.0072 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0022 U	0.0023 U	0.0023 U	0.0021 U
Alpha Endosulfan	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0022 U	0.0023 U	0.0023 U	0.0021 U
Beta Endosulfan	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0022 U	0.0023 U	0.0023 U	0.0021 U
Dieldrin	1.4	0.0022 U	0.0022 U	0.0023 U	0.0023 U	0.0021 U
Endosulfan Sulfate	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0074 U	0.0072 U	0.0077 U	0.0078 UJ	0.0072 U
Endrin Aldehyde	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 UJ	0.0072 U
Endrin Ketone	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 UJ	0.0072 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0022 U	0.0023 U	0.0023 U	0.0021 U
Heptachlor	15	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
Heptachlor Epoxide	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
Methoxychlor	NS	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
P,P'-DDD	92	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
P,P'-DDE	62	0.0074 U	0.0072 U	0.0077 U	0.0078 U	0.0072 U
P,P'-DDT	47	0.0074 U	0.0072 U	0.0077 U	0.0078 UJ	0.0072 U
Toxaphene	NS	0.074 U	0.072 U	0.077 U	0.078 U	0.072 U

	AKRF Sample ID	EP-06_1_20200618	EP-07_1_20200618	EP-08_1_20200618	EP-09_1_20200618	EP-10_1_20200618
Labor	ratory Sample ID	460-211428-5	460-211428-7	460-211428-3	460-211428-6	460-211428-8
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aldrin	0.68	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0022 U	0.0021 U	0.0021 U	0.0021 U
Alpha Endosulfan	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0022 U	0.0021 U	0.0021 U	0.0021 U
Beta Endosulfan	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0022 U	0.0021 U	0.0021 U	0.0021 U
Dieldrin	1.4	0.0022 U	0.0022 U	0.0021 U	0.0021 U	0.0021 U
Endosulfan Sulfate	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Endrin Aldehyde	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Endrin Ketone	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0022 U	0.0021 U	0.0021 U	0.0021 U
Heptachlor	15	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Heptachlor Epoxide	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Methoxychlor	NS	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
P,P'-DDD	92	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
P,P'-DDE	62	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
P,P'-DDT	47	0.0075 U	0.0074 U	0.0069 U	0.0072 U	0.0069 U
Toxaphene	NS	0.075 U	0.074 U	0.069 U	0.072 U	0.069 U

	AKRF Sample ID	EP-11_1_20200618	EP-12_1_20200612	EP-13_1_20200612	EP-14_1_20200501	EP-X04_1_20200501
Labo <sup>,</sup>	ratory Sample ID	460-211428-10	460-210991-4	460-210991-5	460-208010-1	460-208010-7
	Date Sampled	6/18/2020	6/12/2020	6/12/2020	5/01/2020	5/01/2020
	Dilution Factor	1	1	1 1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aldrin	0.68	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0023 U	0.0024 UJ	0.0023 U	0.0023 U
Alpha Endosulfan	NS	0.0073 U	0.0076 U	0.008 U	0.0077 U	0.0077 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0023 U	0.0024 UJ	0.0023 U	0.0023 U
Beta Endosulfan	NS	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0023 U	0.0024 UJ	0.0023 U	0.0023 U
Dieldrin	1.4	0.0022 U	0.0023 U	0.0024 UJ	0.0023 U	0.0023 U
Endosulfan Sulfate	NS	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Endrin Aldehyde	NS	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Endrin Ketone	NS	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0023 U	0.0024 UJ	0.0023 U	0.0023 U
Heptachlor	15	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Heptachlor Epoxide	NS	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Methoxychlor	NS	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
P,P'-DDD	92	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
P,P'-DDE	62	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
P,P'-DDT	47	0.0073 U	0.0076 U	0.008 UJ	0.0077 U	0.0077 U
Toxaphene	NS	0.073 U	0.076 U	0.08 U	0.077 U	0.077 U

Labo	AKRF Sample ID ratory Sample ID	EP-15_1_20200501 460-208010-2	EP-16_1_20200501 460-208010-3	EP-17_1_20200612 460-210991-1	EP-18_1_20200612 460-210991-2	EP-19_1_20200612 460-210991-3
	Date Sampled	5/01/2020	5/01/2020	6/12/2020	6/12/2020	6/12/2020
	Dilution Factor	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aldrin	0.68	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0024 U	0.0022 U	0.0022 U	0.0023 U	0.0022 U
Alpha Endosulfan	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0024 U	0.0022 U	0.0022 U	0.0023 U	0.0022 U
Beta Endosulfan	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0024 U	0.0022 U	0.0022 U	0.0023 U	0.0022 U
Dieldrin	1.4	0.0024 U	0.0022 U	0.0022 U	0.0023 U	0.0022 U
Endosulfan Sulfate	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Endrin Aldehyde	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Endrin Ketone	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Gamma Bhc (Lindane)	9.2	0.0024 U	0.0022 U	0.0022 U	0.0023 U	0.0022 U
Heptachlor	15	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Heptachlor Epoxide	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Methoxychlor	NS	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
P,P'-DDD	92	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
P,P'-DDE	62	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
P,P'-DDT	47	0.0079 U	0.0075 U	0.0072 U	0.0077 U	0.0074 U
Toxaphene	NS	0.079 U	0.075 U	0.072 U	0.077 U	0.074 U

Labo	AKRF Sample ID	EP-20_1_20200217	EP-21_1_20200501	EP-22_1_20200501	EP-23_1_20200226	EP-24_1_20200226
Labo	Dete Sempled	400-203100-11	5/01/2020	400-208010-5 E/01/2020	2/26/2020	2/26/2020
	Date Sampled	2/17/2020	5/01/2020	5/01/2020	2/20/2020	2/20/2020
	Dilution Factor	1 	Т 1	1	1	н 1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.68	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Alpha Endosulfan	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Beta Endosulfan	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Dieldrin	1.4	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Endosulfan Sulfate	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Endrin Aldehyde	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Endrin Ketone	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Heptachlor	15	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Heptachlor Epoxide	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Methoxychlor	NS	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
P,P'-DDD	92	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
P,P'-DDE	62	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
P,P'-DDT	47	0.0074 U	0.0074 U	0.0075 U	0.0073 U	0.0076 U
Toxaphene	NS	0.074 U	0.074 U	0.075 U	0.073 U	0.076 U

Labo	AKRF Sample ID Laboratory Sample ID Date Sampled		EP-25_1_20200217 460-203168-10 2/17/2020	EP-26_1_20200217 460-203168-13 2/17/2020	EP-27_1_20200217 460-203168-14 2/17/2020	EP-28_1_20200217 460-203168-5 2/17/2020
	Dilution Factor	1	1	1	1	1
-	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.68	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0022 U
Alpha Endosulfan	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0022 U
Beta Endosulfan	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0022 U
Dieldrin	1.4	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0022 U
Endosulfan Sulfate	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Endrin Aldehyde	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Endrin Ketone	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0022 U
Heptachlor	15	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Heptachlor Epoxide	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Methoxychlor	NS	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
P,P'-DDD	92	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
P,P'-DDE	62	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
P,P'-DDT	47	0.0075 U	0.0076 U	0.0074 U	0.0078 U	0.0073 U
Toxaphene	NS	0.075 U	0.076 U	0.074 U	0.078 U	0.073 U

Labo	AKRF Sample ID ratory Sample ID	EP-29_1_20200217 460-203168-8 2/17/2020	EP-30_1_20200217 460-203168-9 2/17/2020	EP-31_1_20200217 460-203168-12 2/17/2020	EP-32_1_20200217 460-203168-4 2/17/2020	EP-X2_1_20200217 460-203168-6 2/17/2020
	Date Sampled	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.68	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0024 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Alpha Endosulfan	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0024 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Beta Endosulfan	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0024 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Dieldrin	1.4	0.0024 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Endosulfan Sulfate	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Endrin Aldehyde	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Endrin Ketone	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Gamma Bhc (Lindane)	9.2	0.0024 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Heptachlor	15	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Heptachlor Epoxide	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Methoxychlor	NS	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
P,P'-DDD	92	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
P,P'-DDE	62	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
P,P'-DDT	47	0.0079 U	0.008 U	0.0078 U	0.0074 U	0.0072 U
Toxaphene	NS	0.079 U	0.08 U	0.078 U	0.074 U	0.072 U

	AKRF Sample ID	EP-33_1_20200217	EP-34_1_20200217	EP-35_1_20200203	EP-36_1_20200204	EP-37_1_20200204
Labo	ratory Sample ID	460-203168-3	460-203168-7	460-202180-7	460-202292-7	460-202292-8
	Date Sampled	2/17/2020	2/17/2020	2/03/2020	2/04/2020	2/04/2020
	Dilution Factor	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aldrin	0.68	0.0075 U	0.008 UJ	0.0077 U	0.0074 U	0.0074 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Alpha Endosulfan	NS	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Beta Endosulfan	NS	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Dieldrin	1.4	0.0022 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Endosulfan Sulfate	NS	0.0075 U	0.008 UJ	0.0077 U	0.0074 U	0.0074 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Endrin Aldehyde	NS	0.0075 U	0.008 UJ	0.0077 U	0.0074 U	0.0074 U
Endrin Ketone	NS	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0024 U	0.0023 U	0.0022 U	0.0022 U
Heptachlor	15	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Heptachlor Epoxide	NS	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Methoxychlor	NS	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
P,P'-DDD	92	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
P,P'-DDE	62	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
P,P'-DDT	47	0.0075 U	0.008 U	0.0077 U	0.0074 U	0.0074 U
Toxaphene	NS	0.075 U	0.08 U	0.077 U	0.074 U	0.074 U

Labo	AKRF Sample ID ratory Sample ID	EP-38_1_20200204 460-202292-9	EP-39_1_20200204 460-202292-10	EP-40_1_20200204 460-202292-11	EP-41_1_20200203 460-202180-2	EP-42_1_20200203 460-202180-3
	Date Sampled	2/04/2020	2/04/2020	2/04/2020	2/03/2020	2/03/2020
	Dilution Factor	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.68	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U
Alpha Endosulfan	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U
Beta Endosulfan	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U
Dieldrin	1.4	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U
Endosulfan Sulfate	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Endrin Aldehyde	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Endrin Ketone	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Gamma Bhc (Lindane)	9.2	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0023 U
Heptachlor	15	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Heptachlor Epoxide	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Methoxychlor	NS	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
P,P'-DDD	92	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
P,P'-DDE	62	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
P,P'-DDT	47	0.0074 U	0.0076 U	0.0075 U	0.0078 U	0.0076 U
Toxaphene	NS	0.074 U	0.076 U	0.075 U	0.078 U	0.076 U

Labo	AKRF Sample ID ratory Sample ID	EP-X1_1_20200203 460-202180-6	EP-43_1_20200204 460-202292-3 2/04/2020	EP-44_1_20200204 460-202292-4 2/04/2020	EP-45_1_20200204 460-202292-5 2/04/2020	EP-46_1_20200203 460-202180-1 2/02/2020
	Date Sampled	2/03/2020	2/04/2020	2/04/2020	2/04/2020	2/03/2020
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	ہ mg/kg
Compound	NYSDEC CSCO	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Aldrin	0.68	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0024 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Alpha Endosulfan	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0024 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Beta Endosulfan	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0024 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Dieldrin	1.4	0.0024 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Endosulfan Sulfate	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Endrin Aldehyde	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Endrin Ketone	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Gamma Bhc (Lindane)	9.2	0.0024 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U
Heptachlor	15	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Heptachlor Epoxide	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Methoxychlor	NS	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
P,P'-DDD	92	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
P,P'-DDE	62	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
P,P'-DDT	47	0.0082 U	0.0075 U	0.0074 U	0.0073 U	0.0076 U
Toxaphene	NS	0.082 U	0.075 U	0.074 U	0.073 U	0.076 U

	AKRF Sample ID	EP-47_1_20200204	EP-48_1_20200204	EP-49_7_20200226	SW-01_4_20200226	SW-02_4_20200226
Labo	ratory Sample ID	460-202292-2	460-202292-1	460-203752-6	460-203752-2	460-203752-3
	Date Sampled	2/04/2020	2/04/2020	2/26/2020	2/26/2020	2/26/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Compound	NYSDEC CSCO	CONC Q				
Aldrin	0.68	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.0023 U	0.0023 U	0.0033 U	0.0026 U	0.0026 U
Alpha Endosulfan	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0023 U	0.0023 U	0.0033 U	0.0026 U	0.0026 U
Beta Endosulfan	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0023 U	0.0023 U	0.0033 U	0.0026 U	0.0026 U
Dieldrin	1.4	0.0023 U	0.0023 U	0.0033 U	0.0026 U	0.0026 U
Endosulfan Sulfate	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Endrin Aldehyde	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Endrin Ketone	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Gamma Bhc (Lindane)	9.2	0.0023 U	0.0023 U	0.0033 U	0.0026 U	0.0026 U
Heptachlor	15	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Heptachlor Epoxide	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Methoxychlor	NS	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
P,P'-DDD	92	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
P,P'-DDE	62	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
P,P'-DDT	47	0.0076 U	0.0076 U	0.011 U	0.0088 U	0.0087 U
Toxaphene	NS	0.076 U	0.076 U	0.11 U	0.088 U	0.087 U

Labo	AKRF Sample ID ratory Sample ID	SW-03_4_20200226 460-203752-4	SW-04_4_20200226 460-203752-5	SW-04_3_20200501 460-208010-6	FB-1_20200203 460-202180-5	FB-2_20200217 460-203168-2
	Date Sampled	2/26/2020	2/26/2020	5/01/2020	2/03/2020	2/17/2020
	Dilution Factor	l ma/ka	n ma/ka	n ma/ka	ug/l	l ug/l
Compound	NYSDEC CSCO			CONC O	CONC O	
Aldrin	0.68	0.0085 11	0.0085.11	0.0084 11		
Alpha Bhc (Alpha Hexachlorocyclohexane)	34	0.0025 U	0.0025 11	0.0025 U	0.02 U	0.02 U
Alpha Endosulfan	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.0025 U	0.0025 U	0.0025 U	0.02 U	0.02 U
Beta Endosulfan	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Delta BHC (Delta Hexachlorocyclohexane)	500	0.0025 U	0.0025 U	0.0025 U	0.02 U	0.02 U
Dieldrin	1.4	0.0025 U	0.0025 U	0.0025 U	0.02 U	0.02 U
Endosulfan Sulfate	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Endosulfans ABS	200	0 U	0 U	0 U	0 U	0 U
Endrin	89	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Endrin Aldehyde	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Endrin Ketone	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Gamma Bhc (Lindane)	9.2	0.0025 U	0.0025 U	0.0025 U	0.02 U	0.02 U
Heptachlor	15	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Heptachlor Epoxide	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Methoxychlor	NS	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
P,P'-DDD	92	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
P,P'-DDE	62	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
P,P'-DDT	47	0.0085 U	0.0085 U	0.0084 U	0.02 U	0.02 U
Toxaphene	NS	0.085 U	0.085 U	0.084 U	0.5 UJ	0.5 U

	AKRF Sample ID	FB-03_20200226	EP-FB-04_20200501
Labo	ratory Sample ID	460-203752-10	460-208010-9
	Date Sampled	2/26/2020	5/01/2020
	<b>Dilution Factor</b>	1	1
	Unit	μg/L	μg/L
Compound	NYSDEC CSCO	CONC Q	CONC Q
Aldrin	0.68	0.02 U	0.02 UT
Alpha Bhc (Alpha Hexachlorocyclohexane)	3.4	0.02 U	0.02 U
Alpha Endosulfan	NS	0.02 U	0.02 U
Beta Bhc (Beta Hexachlorocyclohexane)	3	0.02 U	0.02 U
Beta Endosulfan	NS	0.02 U	0.02 UT
Delta BHC (Delta Hexachlorocyclohexane)	500	0.02 U	0.02 U
Dieldrin	1.4	0.02 U	0.02 U
Endosulfan Sulfate	NS	0.02 U	0.02 UT
Endosulfans ABS	200	0 U	0 U
Endrin	89	0.02 U	0.02 U
Endrin Aldehyde	NS	0.02 U	0.02 UT
Endrin Ketone	NS	0.02 U	0.02 UT
Gamma Bhc (Lindane)	9.2	0.02 U	0.02 U
Heptachlor	15	0.02 U	0.02 U
Heptachlor Epoxide	NS	0.02 U	0.02 U
Methoxychlor	NS	0.02 U	0.02 UT
P,P'-DDD	92	0.02 U	0.02 UT
P,P'-DDE	62	0.02 U	0.02 U
P,P'-DDT	47	0.02 U	0.02 UT
Toxaphene	NS	0.5 U	0.5 U

Table 7						
Queens Animal Shelter and Care Center						
151 Woodward Avenue, Queens, NY						
Post-Excavation Soil Endpoint Sampling						
Soil Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS)						

AKRF Sample ID		EP-01_1_20200618	EP-02_1_20200618	EP-03_1_20200618	EP-04_1_20200616	EP-05_1_20200618
Labora	tory Sample ID	200-54059-1	200-54059-4	200-54059-9	200-54011-1	200-54059-2
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/16/2020	6/18/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	ppb	ppb	ppb	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	0.024 J	0.03 J	0.054 J	0.031 J	0.031 J
8:2 Fluorotelomer sulfonate	NS	2.16 U	2.2 U	0.035 J	2.19 U	0.036 J
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.16 U	2.2 U	2.37 U	0.057 J	2.09 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.16 U	0.084 J	2.37 U	2.19 U	2.09 U
Perfluorobutanesulfonic acid	NS	0.22 U	0.22 U	0.24 U	0.22 U	0.21 U
Perfluorobutanoic acid	NS	0.54 U	0.55 U	0.59 U	0.55 U	0.52 U
Perfluorodecanesulfonic acid	NS	0.22 U	0.021 J	0.24 U	0.22 U	0.21 U
Perfluorodecanoic acid	NS	0.27	0.07 J	0.083 J	0.025 J	0.098 J
Perfluorododecanoic acid	NS	0.079 J	0.036 J	0.027 J	0.22 UJ	0.03 J
Perfluoroheptanesulfonic acid	NS	0.22 U	0.22 U	0.24 U	0.22 U	0.017 J
Perfluoroheptanoic acid	NS	0.042 J	0.025 J	0.03 J	0.22 U	0.05 J
Perfluorohexanesulfonic acid	NS	0.22 U	0.22 U	0.24 U	0.22 U	0.21 U
Perfluorohexanoic acid	NS	0.039 J	0.22 U	0.031 J	0.22 U	0.034 J
Perfluorononanoic acid	NS	0.16 J	0.064 J	0.061 J	0.22 U	0.12 J
Perfluorooctanesulfonamide	NS	0.0098 J	0.014 J	0.24 U	0.0097 J	0.01 J
Perfluorooctanesulfonic acid (PFOS)	440	1.9 J	1.06 J	1 J	0.15 J	1.36 J
Perfluorooctanoic acid (PFOA)	500	0.22	0.22 U	0.24 U	0.22 U	0.38
Perfluoropentanoic acid	NS	0.034 J	0.22 U	0.095 J	0.22 U	0.079 J
Perfluorotetradecanoic acid	NS	0.036 J	0.031 J	0.024 J	0.22 U	0.023 J
Perfluorotridecanoic acid	NS	0.039 J	0.018 J	0.02 J	0.22 U	0.02 J
Perfluoroundecanoic acid	NS	0.11 J	0.071 J	0.059 J	0.22 U	0.048 J

# Table 7Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NYPost-Excavation Soil Endpoint SamplingSoil Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS)

AKRF Sample ID		EP-06_1_20200618	EP-07_1_20200618	EP-08_1_20200618	EP-09_1_20200618	EP-10_1_20200618
Labora	Dete Semple ID	200-54059-5	200-54059-7	200-54059-5	200-54059-6	200-54059-6
	Date Sampled	6/18/2020	6/18/2020	6/18/2020	6/18/2020	6/18/2020
	Dilution Factor	1	1	1	1	1
	Unit	ppb	ppb	ppb	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	2.5 U	0.028 J	0.025 J	2.4 U	0.042 J
8:2 Fluorotelomer sulfonate	NS	2.5 U	0.035 J	0.032 J	2.4 U	2.51 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.5 U	2.44 U	2.01 U	2.4 U	2.51 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.5 U	0.15 J	2.01 U	0.07 J	0.12 J
Perfluorobutanesulfonic acid	NS	0.25 U	0.24 U	0.2 U	0.24 U	0.25 U
Perfluorobutanoic acid	NS	0.63 U	0.61 U	0.5 U	0.6 U	0.63 U
Perfluorodecanesulfonic acid	NS	0.25 U	0.047 J	0.2 U	0.24 U	0.25 U
Perfluorodecanoic acid	NS	0.081 J	0.21 J	0.2 U	0.057 J	0.03 J
Perfluorododecanoic acid	NS	0.061 J	0.14 J	0.2 UJ	0.02 J	0.25 UJ
Perfluoroheptanesulfonic acid	NS	0.25 U	0.022 J	0.2 U	0.24 U	0.25 U
Perfluoroheptanoic acid	NS	0.034 J	0.072 J	0.023 J	0.042 J	0.25 U
Perfluorohexanesulfonic acid	NS	0.25 U	0.24 U	0.2 U	0.24 U	0.25 U
Perfluorohexanoic acid	NS	0.25 U	0.24 U	0.025 J	0.24 U	0.25 U
Perfluorononanoic acid	NS	0.085 J	0.14 J	0.025 J	0.053 J	0.032 J
Perfluorooctanesulfonamide	NS	0.015 J	0.046 J	0.2 U	0.24 U	0.019 J
Perfluorooctanesulfonic acid (PFOS)	440	1.43 J	3.16 J	0.38 J	0.73 J	0.33 J
Perfluorooctanoic acid (PFOA)	500	0.25 U	0.33	0.2 U	0.24 U	0.25 U
Perfluoropentanoic acid	NS	0.03 J	0.09 J	0.047 J	0.04 J	0.051 J
Perfluorotetradecanoic acid	NS	0.047 J	0.089 J	0.2 U	0.24 U	0.25 U
Perfluorotridecanoic acid	NS	0.027 J	0.046 J	0.2 U	0.24 U	0.25 U
Perfluoroundecanoic acid	NS	0.098 J	0.2 J	0.2 U	0.049 J	0.035 J
A	KRF Sample ID	EP-11_1_20200618	EP-12_1_20200612	EP-13_1_20200612	EP-14_1_20200501	EP-X04_1_20200501
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Laboratory Sample ID		200-54059-10	200-53963-4	200-53963-5	200-53553-1	200-53553-7
	Date Sampled	6/18/2020	6/12/2020	6/12/2020	5/01/2020	5/01/2020
	Dilution Factor	1	1	1	1	1
	Unit	ppb	ppb	ppb	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	0.034 J	2.23 U	2.31 U	0.037 J	2.23 UJ
8:2 Fluorotelomer sulfonate	NS	2.39 U	2.23 U	2.31 U	2.26 U	2.23 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.39 U	0.25 J	0.047 J	2.26 U	2.23 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	0.042 J	0.084 J	2.31 U	2.26 U	2.23 U
Perfluorobutanesulfonic acid	NS	0.24 U	0.22 U	0.23 U	0.03 J	0.22 UJ
Perfluorobutanoic acid	NS	0.6 U	0.56 U	0.58 U	0.57 U	0.56 U
Perfluorodecanesulfonic acid	NS	0.03 J	0.029 J	0.23 U	0.23 U	0.22 U
Perfluorodecanoic acid	NS	0.24 U	0.22 U	0.23 U	0.23 U	0.22 U
Perfluorododecanoic acid	NS	0.24 UJ	0.22 U	0.23 U	0.23 U	0.22 U
Perfluoroheptanesulfonic acid	NS	0.24 U	0.22 U	0.23 U	0.23 UJ	0.22 UJ
Perfluoroheptanoic acid	NS	0.24 U	0.22 U	0.23 U	0.029 J	0.22 U
Perfluorohexanesulfonic acid	NS	0.24 U	0.22 U	0.23 U	0.23 U	0.22 U
Perfluorohexanoic acid	NS	0.24 U	0.22 U	0.23 U	0.23 U	0.22 U
Perfluorononanoic acid	NS	0.24 U	0.22 U	0.05 J	0.11 J	0.059 J
Perfluorooctanesulfonamide	NS	0.011 J	0.035 J	0.23 U	0.23 UJ	0.22 UJ
Perfluorooctanesulfonic acid (PFOS)	440	0.2 J	0.38	0.2 J	0.97 J	0.42 J
Perfluorooctanoic acid (PFOA)	500	0.24 U	0.22 U	0.23 U	0.23 U	0.22 U
Perfluoropentanoic acid	NS	0.24 U	0.04 J	0.23 U	0.23 U	0.22 U
Perfluorotetradecanoic acid	NS	0.24 U	0.22 UJ	0.23 UJ	0.23 U	0.22 U
Perfluorotridecanoic acid	NS	0.24 U	0.22 U	0.23 U	0.23 U	0.22 U
Perfluoroundecanoic acid	NS	0.24 U	0.052 J	0.23 U	0.23 U	0.032 J

Table 7						
Queens Animal Shelter and Care Center						
151 Woodward Avenue, Queens, NY						
Post-Excavation Soil Endpoint Sampling						
Soil Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS)						

A	KRF Sample ID	EP-15_1_20200501	EP-16_1_20200501	EP-17_1_20200612	EP-18_1_20200612	EP-19_1_20200612
Labora	tory Sample ID	200-53553-2	200-53553-3	200-53963-1	200-53963-2	200-53963-3
	Date Sampled	5/01/2020	5/01/2020	6/12/2020	6/12/2020	6/12/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	ppb	ppb	ppb	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	0.042 J	2.27 UJ	2.13 U	2.16 U	2.14 U
8:2 Fluorotelomer sulfonate	NS	2.18 U	2.27 U	2.13 U	2.16 U	2.14 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.18 U	2.27 U	0.11 J	2.16 U	0.058 J
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.18 U	2.27 U	0.11 J	2.16 U	2.14 U
Perfluorobutanesulfonic acid	NS	0.059 J	0.014 J	0.04 J	0.22 U	0.21 U
Perfluorobutanoic acid	NS	0.55 U	0.57 U	0.53 U	0.54 U	0.54 U
Perfluorodecanesulfonic acid	NS	0.22 U	0.23 U	0.21 U	0.22 U	0.21 U
Perfluorodecanoic acid	NS	0.22 U	0.23 U	0.21 U	0.028 J	0.022 J
Perfluorododecanoic acid	NS	0.22 U	0.23 U	0.019 J	0.22 U	0.21 U
Perfluoroheptanesulfonic acid	NS	0.22 UJ	0.23 UJ	0.21 U	0.22 U	0.21 U
Perfluoroheptanoic acid	NS	0.032 J	0.23 U	0.21 U	0.026 J	0.21 U
Perfluorohexanesulfonic acid	NS	0.22 U	0.23 U	0.21 U	0.22 U	0.21 U
Perfluorohexanoic acid	NS	0.22 U	0.23 U	0.21 U	0.22 U	0.21 U
Perfluorononanoic acid	NS	0.22 UJ	0.23 UJ	0.027 J	0.025 J	0.061 J
Perfluorooctanesulfonamide	NS	0.22 U	0.23 U	0.21 U	0.014 J	0.012 J
Perfluorooctanesulfonic acid (PFOS)	440	0.2 J	0.12 J	0.26	0.7	0.58
Perfluorooctanoic acid (PFOA)	500	0.22 U	0.23 U	0.21 U	0.22 U	0.21 U
Perfluoropentanoic acid	NS	0.22 U	0.23 U	0.04 J	0.22 U	0.023 J
Perfluorotetradecanoic acid	NS	0.023 J	0.23 U	0.21 U	0.22 U	0.21 U
Perfluorotridecanoic acid	NS	0.22 U	0.23 U	0.21 U	0.22 U	0.21 U
Perfluoroundecanoic acid	NS	0.22 U	0.23 U	0.026 J	0.036 J	0.031 J

A	KRF Sample ID	EP-20_1_20200217	EP-21_1_20200501	EP-22_1_20200501	EP-23_1_20200226	EP-24_1_20200226
Laboratory Sample ID		2/17/2020	5/01/2020	5/01/2020	2/26/2020	2/26/2020
	Date Sampled	1	3/01/2020	3/01/2020	2/20/2020	2/20/2020
	Dilution Factor	l nnh	l nab	l nnh	l nnh	l nnh
Compound						
Compound C:0 Eliveretelemen evillemete	NC NC					
6.2 Fluorotelomer sullonate	NS NO	2.21 U	0.025 J	2.08 UJ	2.06 U	2.16 U
8:2 Fluorotelomer sulfonate	NS	2.21 U	2.2 U	2.08 U	2.06 U	2.16 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.21 U	2.2 U	2.08 U	2.06 U	2.16 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.21 U	2.2 U	2.08 U	2.06 U	2.16 U
Perfluorobutanesulfonic acid	NS	0.22 U	0.02 J	0.014 J	0.21 U	0.22 U
Perfluorobutanoic acid	NS	0.55 U	0.55 U	0.52 U	0.51 U	0.54 U
Perfluorodecanesulfonic acid	NS	0.031 J	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorodecanoic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.028 J
Perfluorododecanoic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluoroheptanesulfonic acid	NS	0.22 U	0.22 UJ	0.21 UJ	0.21 U	0.22 U
Perfluoroheptanoic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorohexanesulfonic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorohexanoic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorononanoic acid	NS	0.22 U	0.025 J	0.21 UJ	0.06 J	0.22 U
Perfluorooctanesulfonamide	NS	0.011 J	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorooctanesulfonic acid (PFOS)	440	0.22 U	0.17 J	0.21 J	0.084 J	0.16 J
Perfluorooctanoic acid (PFOA)	500	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluoropentanoic acid	NS	0.026 J	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorotetradecanoic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluorotridecanoic acid	NS	0.22 U	0.22 U	0.21 U	0.21 U	0.22 U
Perfluoroundecanoic acid	NS	0.032 J	0.22 U	0.21 U	0.21 U	0.22 U

Table 7						
Queens Animal Shelter and Care Center						
151 Woodward Avenue, Queens, NY						
Post-Excavation Soil Endpoint Sampling						
Soil Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS)						

AKRF Sample ID		EP-X3_1_20200226 200-52791-7	EP-25_1_20200217 200-52678-9	EP-26_1_20200217 200-52678-12	EP-27_1_20200217 200-52678-13	EP-28_1_20200217 200-52678-4
	Date Sampled	2/26/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
	Dilution Factor	1	1	1	1	1
	Unit	dqq	dqq	dqq	dqq	dqq
Compound	NYSDEC CGV	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	2.1 U	0.062 J	2.12 U	0.025 J	2.02 U
8:2 Fluorotelomer sulfonate	NS	2.1 U	2.11 U	2.12 U	2.22 U	2.02 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.1 U	0.038 J	2.12 U	2.22 U	0.034 J
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.1 U	2.11 U	2.12 U	2.22 U	2.02 U
Perfluorobutanesulfonic acid	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluorobutanoic acid	NS	0.52 U	0.53 U	0.53 U	0.28 J	0.51 U
Perfluorodecanesulfonic acid	NS	0.21 U	0.96	0.21 U	0.22 U	0.2 U
Perfluorodecanoic acid	NS	0.21 U	0.038 J	0.024 J	0.22 U	0.2 U
Perfluorododecanoic acid	NS	0.21 U	0.016 J	0.016 J	0.22 U	0.016 J
Perfluoroheptanesulfonic acid	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluoroheptanoic acid	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluorohexanesulfonic acid	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluorohexanoic acid	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluorononanoic acid	NS	0.21 U	0.03 J	0.023 J	0.037 J	0.2 U
Perfluorooctanesulfonamide	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluorooctanesulfonic acid (PFOS)	440	0.13 J	0.35 U	0.7 U	0.33 U	0.2 U
Perfluorooctanoic acid (PFOA)	500	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluoropentanoic acid	NS	0.21 U	0.019 J	0.21 U	0.22 U	0.2 U
Perfluorotetradecanoic acid	NS	0.21 U	0.21 U	0.21 U	0.22 UJ	0.2 U
Perfluorotridecanoic acid	NS	0.21 U	0.21 U	0.21 U	0.22 U	0.2 U
Perfluoroundecanoic acid	NS	0.21 U	0.036 J	0.21 U	0.22 U	0.2 U

Table 7						
Queens Animal Shelter and Care Center						
151 Woodward Avenue, Queens, NY						
Post-Excavation Soil Endpoint Sampling						
Soil Analytical Results of Per- and Polyfluoroalkyl Substances (PFAS)						

A	KRF Sample ID	EP-X2_20200217	EP-29_1_20200217	EP-30_1_20200217	EP-31_1_20200217	EP-32_1_20200217
		200-52076-5	200-52070-7	200-52070-0	200-52070-11	200-52076-5
	Date Sampled	2/17/2020	2/17/2020	2/17/2020	2/17/2020	2/17/2020
	Dilution Factor	1	1	1	1	1
-	Unit	ррь	ррр	ррб	ррб	ррб
Compound	NYSDEC CGV	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	2.1 U	2.25 U	2.29 U	2.33 U	2.16 U
8:2 Fluorotelomer sulfonate	NS	2.1 U	2.25 U	2.29 U	2.33 U	2.16 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	0.033 J	0.14 J	2.29 U	2.33 U	0.082 J
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.1 U	2.25 U	2.29 U	2.33 U	0.061 J
Perfluorobutanesulfonic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.22 U
Perfluorobutanoic acid	NS	0.52 U	0.56 U	0.57 U	0.24 J	0.54 U
Perfluorodecanesulfonic acid	NS	0.21 U	0.033 J	0.23 U	0.23 U	0.22 U
Perfluorodecanoic acid	NS	0.21 U	0.032 J	0.23 U	0.23 U	0.026 J
Perfluorododecanoic acid	NS	0.21 U	0.019 J	0.23 U	0.23 U	0.03 J
Perfluoroheptanesulfonic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.22 U
Perfluoroheptanoic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.22 U
Perfluorohexanesulfonic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.22 U
Perfluorohexanoic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.22 U
Perfluorononanoic acid	NS	0.21 U	0.05 J	0.064 J	0.031 J	0.22 U
Perfluorooctanesulfonamide	NS	0.21 U	0.017 J	0.23 U	0.23 U	0.022 J
Perfluorooctanesulfonic acid (PFOS)	440	0.21 U	0.42 U	0.44 U	0.23 U	0.51 U
Perfluorooctanoic acid (PFOA)	500	0.21 U	0.23 U	0.23 U	0.23 U	0.22 U
Perfluoropentanoic acid	NS	0.21 U	0.23 U	0.023 J	0.037 J	0.22 U
Perfluorotetradecanoic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.029 J
Perfluorotridecanoic acid	NS	0.21 U	0.23 U	0.23 U	0.23 U	0.014 J
Perfluoroundecanoic acid	NS	0.21 U	0.043 J	0.031 J	0.029 J	0.041 J

A	KRF Sample ID	EP-33_1_20200217	EP-34_1_20200217	EP-35_1_20200203	EP-36_1_20200204	EP-37_1_20200204
Labora	tory Sample ID	200-52678-2	200-52678-6	460-202180-7	460-202291-7	460-202291-8
	Date Sampled	2/17/2020	2/17/2020	2/03/2020	2/04/2020	2/04/2020
	<b>Dilution Factor</b>	1	1	1	1	1
	Unit	ppb	ppb	ppb	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	2.12 U	2.25 U	2.24 U	2.05 U	2.14 U
8:2 Fluorotelomer sulfonate	NS	2.12 U	2.25 U	2.24 U	2.05 U	2.14 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.12 U	2.25 U	0.036 J	0.038 J	2.14 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.12 U	0.055 J	2.24 U	0.04 J	2.14 U
Perfluorobutanesulfonic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluorobutanoic acid	NS	0.53 U	0.56 U	0.56 U	0.2 J	0.2 J
Perfluorodecanesulfonic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluorodecanoic acid	NS	0.21 U	0.22 U	0.031 J	0.043 J	0.21 U
Perfluorododecanoic acid	NS	0.21 U	0.22 U	0.22 U	0.016 J	0.21 U
Perfluoroheptanesulfonic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluoroheptanoic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluorohexanesulfonic acid	NS	0.21 U	0.22 U	0.22 U	0.027 J	0.022 J
Perfluorohexanoic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluorononanoic acid	NS	0.21 U	0.22 U	0.077 J	0.057 J	0.023 J
Perfluorooctanesulfonamide	NS	0.011 J	0.023 J	0.22 U	0.21 U	0.21 U
Perfluorooctanesulfonic acid (PFOS)	440	0.21 U	0.22 U	0.57 J	1.25	0.31
Perfluorooctanoic acid (PFOA)	500	0.21 U	0.22 U	0.44 B	0.21 U	0.21 U
Perfluoropentanoic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluorotetradecanoic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluorotridecanoic acid	NS	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U
Perfluoroundecanoic acid	NS	0.21 U	0.19 J	0.22 U	0.025 J	0.21 U

AKRF Sample ID		EP-38_1_20200204	EP-39_1_20200204	EP-40_1_20200204	EP-41_1_20200203	EP-42_1_20200203
Eabora	Date Sample ID	2/04/2020	2/04/2020	2/04/2020	2/03/2020	2/03/2020
	Dilution Factor	1	1	1	1	1
	Unit	daa	nnb	nph	nnh	nnb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	2.05 U	2.22 U	2.12 U	2.31 U	0.052 J
8:2 Fluorotelomer sulfonate	NS	2.05 U	2.22 U	2.12 U	2.31 U	2.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	0.031 J	2.22 U	0.082 J	2.31 U	2.2 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	0.04 J	2.22 U	2.12 U	2.31 U	2.2 U
Perfluorobutanesulfonic acid	NS	0.2 U	0.22 U	0.21 U	0.23 U	0.22 U
Perfluorobutanoic acid	NS	0.51 U	0.55 U	0.53 U	0.58 U	0.55 U
Perfluorodecanesulfonic acid	NS	0.2 U	0.22 U	0.21 U	0.23 U	0.22 U
Perfluorodecanoic acid	NS	0.024 J	0.078 J	0.034 J	0.23 U	0.22 U
Perfluorododecanoic acid	NS	0.021 J	0.22 U	0.024 J	0.23 U	0.22 U
Perfluoroheptanesulfonic acid	NS	0.2 U	0.22 U	0.21 U	0.23 U	0.22 U
Perfluoroheptanoic acid	NS	0.2 U	0.22 U	0.21 U	0.037 J	0.22 U
Perfluorohexanesulfonic acid	NS	0.033 J	0.033 J	0.035 J	0.23 U	0.22 U
Perfluorohexanoic acid	NS	0.2 U	0.22 U	0.21 U	0.034 J	0.22 U
Perfluorononanoic acid	NS	0.041 J	0.028 J	0.21 U	0.15 J	0.22 U
Perfluorooctanesulfonamide	NS	0.026 J	0.22 U	0.041 J	0.23 U	0.22 U
Perfluorooctanesulfonic acid (PFOS)	440	0.61	2.02	0.56	1.13 J	0.54 J
Perfluorooctanoic acid (PFOA)	500	0.2 U	0.22 U	0.21 U	0.27 B	0.22 U
Perfluoropentanoic acid	NS	0.2 U	0.22 U	0.21 U	0.048 J	0.22 U
Perfluorotetradecanoic acid	NS	0.02 J	0.22 U	0.21 U	0.23 U	0.22 U
Perfluorotridecanoic acid	NS	0.016 J	0.22 U	0.21 U	0.23 U	0.22 U
Perfluoroundecanoic acid	NS	0.036 J	0.22 U	0.044 J	0.23 U	0.22 U

AKRF Sample ID		EP-X1_1_20200203 460-202180-6	EP-43_1_20200204 460-202291-3	EP-44_1_20200204 460-202291-4	EP-45_1_20200204 460-202291-5	EP-46_1_20200203 460-202180-1
	Date Sampled	2/03/2020	2/04/2020	2/04/2020	2/04/2020	2/03/2020
	Dilution Factor	1	1	1	1	1
	Unit	ppb	dqq	dqq	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	2.35 U	2.21 U	2.17 U	2.04 U	0.32 J
8:2 Fluorotelomer sulfonate	NS	2.35 U	2.21 U	2.17 U	2.04 U	2.2 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.35 U	2.21 U	2.17 U	2.04 U	2.2 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.35 U	2.21 U	2.17 U	2.04 U	0.039 J
Perfluorobutanesulfonic acid	NS	0.24 U	0.022 J	0.015 J	0.018 J	0.22 U
Perfluorobutanoic acid	NS	0.59 U	0.55 U	0.23 J	0.51 U	0.55 U
Perfluorodecanesulfonic acid	NS	0.24 U	0.022 J	0.22 U	0.2 U	0.22 U
Perfluorodecanoic acid	NS	0.24 U	0.035 J	0.22 U	0.2 U	0.032 J
Perfluorododecanoic acid	NS	0.24 U	0.22 U	0.22 U	0.2 U	0.022 J
Perfluoroheptanesulfonic acid	NS	0.24 U	0.22 U	0.22 U	0.2 U	0.22 U
Perfluoroheptanoic acid	NS	0.036 J	0.22 U	0.22 U	0.2 U	0.039 J
Perfluorohexanesulfonic acid	NS	0.24 U	0.033 J	0.022 J	0.023 J	0.22 U
Perfluorohexanoic acid	NS	0.24 U	0.22 U	0.22 U	0.2 U	0.051 J
Perfluorononanoic acid	NS	0.1 J	0.031 J	0.022 J	0.2 U	0.072 J
Perfluorooctanesulfonamide	NS	0.24 U	0.014 J	0.018 J	0.019 J	0.22 U
Perfluorooctanesulfonic acid (PFOS)	440	0.88 J	0.79	0.36	0.2 U	0.69 J
Perfluorooctanoic acid (PFOA)	500	0.24 U	0.22 U	0.22 U	0.2 U	0.22 U
Perfluoropentanoic acid	NS	0.04 J	0.038 J	0.22 U	0.034 J	0.048 J
Perfluorotetradecanoic acid	NS	0.24 U	0.22 U	0.22 U	0.2 U	0.22 U
Perfluorotridecanoic acid	NS	0.24 U	0.22 U	0.22 U	0.013 J	0.014 J
Perfluoroundecanoic acid	NS	0.24 U	0.034 J	0.032 J	0.026 J	0.044 J

A	KRF Sample ID	EP-47_1_20200204	EP-48_1_20200204	EP-49_7_20200226	SW-01_4_20200226	SW-02_4_20200226
Labora	tory Sample ID	460-202291-2	460-202291-1	200-52791-5	200-52791-1	200-52791-2
	Date Sampled	2/04/2020	2/04/2020	2/26/2020	2/26/2020	2/26/2020
	Dilution Factor	1	1	1	1	1
	Unit	ppb	ppb	ppb	ppb	ppb
Compound	NYSDEC CGV	CONC Q				
6:2 Fluorotelomer sulfonate	NS	2.18 U	2.22 U	0.044 H	2.49 U	2.47 U
8:2 Fluorotelomer sulfonate	NS	2.18 U	2.22 U	2.98 U	2.49 U	2.47 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	0.07 J	0.061 J	2.98 U	2.49 U	2.47 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.18 U	2.22 U	2.98 U	2.49 U	2.47 U
Perfluorobutanesulfonic acid	NS	0.017 J	0.018 J	0.3 U	0.25 U	0.25 U
Perfluorobutanoic acid	NS	0.54 U	0.25 J	0.74 U	0.62 U	0.26 J
Perfluorodecanesulfonic acid	NS	0.22 U	0.22 U	0.3 U	0.25 U	0.25 U
Perfluorodecanoic acid	NS	0.055 J	0.039 J	0.3 U	0.25 U	0.25 U
Perfluorododecanoic acid	NS	0.019 J	0.019 J	0.3 U	0.25 U	0.25 U
Perfluoroheptanesulfonic acid	NS	0.22 U	0.22 U	0.3 U	0.25 U	0.25 U
Perfluoroheptanoic acid	NS	0.22 U	0.027 J	0.3 U	0.25 U	0.25 U
Perfluorohexanesulfonic acid	NS	0.027 J	0.031 J	0.3 U	0.25 U	0.25 U
Perfluorohexanoic acid	NS	0.22 U	0.052 J	0.3 U	0.25 U	0.25 U
Perfluorononanoic acid	NS	0.025 J	0.031 J	0.11 J	0.047 J	0.25 U
Perfluorooctanesulfonamide	NS	0.023 J	0.019 J	0.3 U	0.25 U	0.25 U
Perfluorooctanesulfonic acid (PFOS)	440	1.23	0.81	0.12 J	0.24 J	0.25 U
Perfluorooctanoic acid (PFOA)	500	0.22 U	0.22 U	0.54	0.25 U	0.28
Perfluoropentanoic acid	NS	0.029 J	0.22 U	0.3 U	0.25 U	0.25 U
Perfluorotetradecanoic acid	NS	0.22 U	0.022 J	0.3 U	0.25 U	0.25 U
Perfluorotridecanoic acid	NS	0.018 J	0.22 U	0.3 U	0.25 U	0.25 U
Perfluoroundecanoic acid	NS	0.053 J	0.028 J	0.3 U	0.25 U	0.25 U

A	KRF Sample ID	SW-03_4_20200226	SW-04_4_20200226	SW-04_3_20200501	EP-FB-04_20200501
Labora	atory Sample ID	200-52791-3	200-52791-4	200-53553-6	200-53553-8
	Date Sampled	2/26/2020	2/26/2020	5/01/2020	5/01/2020
	Dilution Factor	1	1	1	1
	Unit	ppb	ppb	ppb	ppt
Compound	NYSDEC CGV	CONC Q	CONC Q	CONC Q	CONC Q
6:2 Fluorotelomer sulfonate	NS	0.037 J	2.2 U	2.4 UJ	16.7 U
8:2 Fluorotelomer sulfonate	NS	2.68 U	2.2 U	2.4 U	16.7 U
N-ethyl perfluorooctanesulfonamidoacetic acid	NS	2.68 U	0.19 J	2.4 U	16.7 U
N-methyl perfluorooctanesulfonamidoacetic acid	NS	2.68 U	0.071 J	2.4 U	16.7 U
Perfluorobutanesulfonic acid	NS	0.27 U	0.22 U	0.24 UJ	1.67 U
Perfluorobutanoic acid	NS	0.25 J	0.55 U	0.6 U	1.67 U
Perfluorodecanesulfonic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluorodecanoic acid	NS	0.27 U	0.024 J	0.027 J	1.67 U
Perfluorododecanoic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluoroheptanesulfonic acid	NS	0.27 U	0.22 U	0.24 UJ	1.67 U
Perfluoroheptanoic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluorohexanesulfonic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluorohexanoic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluorononanoic acid	NS	0.038 J	0.046 J	0.036 J	1.67 U
Perfluorooctanesulfonamide	NS	0.27 U	0.014 J	0.021 J	8.35 U
Perfluorooctanesulfonic acid (PFOS)	440	0.097 J	0.22	0.35 J	1.67 U
Perfluorooctanoic acid (PFOA)	500	0.27 U	0.22 U	0.24 U	1.67 U
Perfluoropentanoic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluorotetradecanoic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluorotridecanoic acid	NS	0.27 U	0.22 U	0.24 U	1.67 U
Perfluoroundecanoic acid	NS	0.27 U	0.031 J	0.24 U	1.67 U

## Tables 2-7 **Queens Animal Shelter and Care Center** 151 Woodward Avenue, Queens, NY Post-Excavation Soil Endpoint Sampling

Notes

## DEFINITIONS

- B: The analyte was found in an associated blank, as well as in the sample.
- **H**: Sample result is estimated and biased high.
- J: The concentration given is an estimated value.
- L: Sample result is estimated and biased low.
- NR: Not reported.
- NS: No standard.
- **R**: Indicates the reported result is unusable. (note: the analyte may or may not be present.)
- T: Indicates that a quality control parameter has exceeded laboratory limits.
- U: The analyte was not detected at the indicated concentration.
- mg/kg: milligrams per kilogram
  - ppb: parts per billion
  - ppt: parts per trillion
  - µg/L : micrograms per liter

#### **STANDARDS**

## Part 375 Soil Cleanup

Soil Cleanup Objectives listed in New York State Department of Environmental Conservation (NYSDEC) "Part 375" Regulations [6 New York Codes, Rules and Regulations (NYCRR) Part 375]. **Objectives** 

Note: Endosulfans ABS represents the detected sum of Endosulfan I, Endosulfan II, and Endosulfan Sulfate.

Exceedances of Part 375 Commercial Use Soil Cleanup Objectives (CSCOs) are highlighted in bold font. Exceedances of Part 375 Protection of Groundwater Soil Cleanup Objectives (PGWSCOs) are highlighted in gray shading.

NYSDEC Part 375 PFAS

New York State Department of Environmental Conservation (NYSDEC) Sampling, Analysis and : Assessment Of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Guidance Programs Issued April 2023. Values

Exceedances of NYSDEC PFAS Commercial Use Guidance Values (CGVs) are highlighted in bold font.

#### **DUPLICATES**

EP-X04 1 20200501 is a blind duplicate of sample EP-14 1 20200501 EP-X1\_1\_20200203 is a blind duplicate of sample EP-42\_1\_20200203 EP-X2\_1\_20200217 is a blind duplicate of sample EP-32\_1\_20200217 EP-X2\_20200217 is a blind duplicate of sample EP-28\_1\_20200217 EP-X3\_1\_20200226 is a blind duplicate of sample EP-24\_1\_20200226 EP-X5 1 20200612 is a blind duplicate of sample EP-13 1 20200612 EP-X6 1 20200616 is a blind duplicate of sample EP-04 1 20200616

## Table 8Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NY

Post-Remedial Groundwater Sampling Analytical Results of VOCs

		, indige				
A	KRF Sample ID	MW-05B_20200417	MW-06B_20200417	DUPLICATE_20200417	MW-08B_20200417	TRIPBLANK_20200417
Labora	tory Sample ID	460-207210-5	460-207210-3	460-207210-6	460-207210-4	460-207210-2
	Date Sampled	4/17/2020	4/17/2020	4/17/2020	4/17/2020	4/17/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	<b>Dilution Factor</b>	2	2	2	1	1
Compound	AWQSGV	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1 1 1-Trichloroethane	5	211	211	2 U	1 U	1 U
1 1 2 2-Tetrachloroethane	5	211	211	211	1 U	1 U
1 1 2-Trichloro-1 2 2-Trifluoroethane (Freon TE)	5	211	211	211	1 U	1 U
1 1 2-Trichloroethane	1	211	211	211	1 U	1 U
1 1-Dichloroethane	5	2.0	2 U	2 U	1 U	1 U
1 1-Dichloroethene	5	211	211	211	1	1
1 2 3-Trichlorobenzene	5	2	2 11	211	1 []	1 U
1 2 4-Trichlorobenzene	5	211	211	211	1	1
1.2.4-Trimethylbenzene	5	23	0.85.1	211	130	
1 2-Dibromo-3-Chloropropape	0.04	211	211	2.0	1	
1,2-Dibromoethane (Ethylene Dibromide)	0.04	211	20	2.0	1	1
1.2-Dichlorobenzene	0.0000	2.0	2.0	2.0	1	1
1,2-Dichloroethane	0.6	2.0	2 00	2 03	1	1 11
1 2-Dichloropropage	1	20	20	20	1	1
1 3 5-Trimethylbenzene (Mesitylene)	5	1.2.0	20	20	20	1
1 3-Dichlorobenzene	2	<u>)    </u>	20	20		1
1 4-Dichlorobenzene	3 2	20	2 03	2 03	1	1
2 Hovenone	50	10			5.11	5.1
	50	10 U	10 0J	10 0J	50	50
Renzona	<b>50</b>	211		<b>03</b>	1 1	50
Bromashlaramathana	5	20	20	20	10	10
Bromodiableremethene	5	20	20	20	10	10
Bromoform	50	20	20	20	10	10
Bromomothene	50	2 UJ	2 03	2 03	1 05	1 05
Dromomethane Carbon Digulfida	5	20	20	20	10	10
Carbon Disulide	60 F	20	20	20	10	10
	5	20	20	20	10	10
Chloropenzene	5	20	20	20	10	10
Chloroferm	5	20	20	20		10
Chloroform Oblemente attende	<i>і</i> Г	20	20	20		10
Chioromethane	5	20	20	20	10	10
	5	20	20	20	10	10
	NS NC	20	20	20	10	10
Cyclonexane	NS 50	20	20	20	10	10
Dipromocnioromethane	50	20	20	20		
	5	2 03	2 UJ	2 UJ	1 05	<u> </u>
	5	20	20	20	<u> </u>	10
	5	20	20	20	2.5	10
M,P-Xylenes	5	2.9	20	20	62	0.67 J
Methyl Acetate	NS 50	10 U	3.4 J	2.8 J	50	50
Methyl Ethyl Ketone (2-Butanone)	50	10 U	6.4 J	6.5 J	50	50
Ivietnyi isobutyi Ketone (4-Metnyi-2-Pentanone)	INS NO				50	50
	NS	20	20	20	1.3	10
	5	2.0	20	20	10	0.43 J
N-Butylbenzene	5	20	20	20	3	10
	5	2.0	20	20	5.9	10
	5	2 U	20	20	28	10
Sec-Butylbenzene	5	20	20	20	1.5	10
	5	2 U	2 U	2 U	1 U	10
	5	2 U	20	2 U	10	10
	NS	210	340	340	10 U	10 U
I ert-Butyl Methyl Ether	10	600	690	730	1.9	10
I etrachloroethylene (PCE)	5	2 U	2 U	2 U	<u>1</u> U	10
	5	2 U	2 U	2 U	0.87 J	10
I rans-1,2-Dichloroethene	5	2 U	2 U	2 U	1 U	10
I rans-1,3-Dichloropropene	NS _	2 U	2 U	2 U	1 U	10
I richloroethylene (TCE)	5	2 U	2 U	2 U	<u> </u>	10
I richlorotluoromethane	5	2 U	2 U	2 U	<u> </u>	10
Vinyl Chloride	2	2 U	2 U	2 U	1 U	1 U

# Table 8 Queens Animal Shelter and Care Center 151 Woodward Avenue, Queens, NY Post-Remedial Groundwater Sampling Analytical Results of VOCs Xylenes, Total NS 2.9 J 4 U 4 U

0.67 J

90

## Table 7Queens Animal Shelter and Care Center151 Woodward Avenue, Queens, NYPost-Remedial Groundwater Sampling<br/>Notes

## DEFINITIONS

- **J**: The concentration given is an estimated value.
- **NS**: No standard.
- **U** : The analyte was not detected at the indicated concentration.
- **µg/L** : micrograms per liter

## STANDARDS

NYSDEC	New York State Department of Environmental Conservation (NYSDEC) Technical and Opera
Class GA	: Guidance Series (1.1.1): Class GA Ambient Water Quality Standards and Guidance Values
AWQSGVs	(AWQSGVs).

## Exceedances of NYSDEC Class GA AWQSGVs are highlighted in bold font.

## DUPLICATES

DUPLICATE\_20200417 is a blind duplicate of sample MW-06B\_20200417

APPENDIX A Environmental Easement

NYC DEPARTMENT OF OFFICE OF THE CITY R This page is part of the instrumer Register will rely on the informat by you on this page for purposes this instrument. The information will control for indexing purpose of any conflict with the rest of the	F FINANCE REGISTER nt. The City tion provided of indexing on this page es in the event ne document.		202107190015	51001004E0840	
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<b>GRANTOR/SELLER:</b> 1906 FLUSHING LLC 11 PARK PLACE NEW YORK, NY 10007		PAR	TIES  GRANTEE/BUYER: PEOPLE OF THE STA 625 BROADWAY ALBANY, NY 12233	ATE OF NEW YORK - N	YSDEC
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Affidavit Fee:	\$	0.00		Annette M fill	<i>,</i>
				City Register Official	Signature

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

THIS INDENTURE made this 7<sup>th</sup> day of 30, 20<sup>24</sup>, between Owner, 1906 Flushing LLC, having an office at 11 Park Avenue, Suite 8065, New York, New York 10007, County of New York, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

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

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

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

WHEREAS, Grantor, is the owner of real property located at the address of 1902 Flushing Avenue in the City of New York, County of Queens and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 3376 Lot 1, being the same as that property conveyed to Grantor by deed dated June 21, 2019 and recorded in the City Register of the City of New York as CRFN # 2019000209470. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.00535 +/- acres, and is hereinafter more fully described in the Land Title Survey dated June 27, 2020 prepared by Frank Galluzzo, LLS of Empire State Land Surveyor, P.C., which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is

extinguished pursuant to ECL Article 71, Title 36; and

**NOW THEREFORE**, in consideration of the mutual covenants contained herein and the terms and conditions of Brownfield Cleanup Agreement Index Number: C241230-03-19 as amended January 22, 2021, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement").

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

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

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

## Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

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

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

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

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

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

(7) All future activities on the property that will disturb remaining

Environmental Easement Page 2

contaminated material must be conducted in accordance with the SMP;

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

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

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

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

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

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

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

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

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

## pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

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

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

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

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

(i) are in-place;

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

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

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

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

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

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

(7) the information presented is accurate and complete.

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

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

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

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

## 5. <u>Enforcement</u>

3

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

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

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

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

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

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

Parties shall address correspondence to:Site Number: C241230<br/>Office of General Counsel<br/>NYSDEC<br/>625 Broadway<br/>Albany New York 12233-5500With a copy to:Site Control Section<br/>Division of Equation 100

Site Control Section Division of Environmental Remediation NYSDEC 625 Broadway Albany, NY 12233

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

Environmental Easement Page 5

communicating notices and responses to requests for approval.

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

8. <u>Amendment</u>. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

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

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

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

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

1906 Flushing Avenue LLC:

Print Name: Jennifer Pilbe

Title: Vice President' Date: 08-25-2021 Secretary

**Grantor's Acknowledgment** 

## STATE OF NEW YORK

COUNTY OF

On the  $25^{\text{H}}_{\text{Derived}}$  day of  $\underline{May}_{\text{ripe}}$ , in the year 2024, before me, the undersigned, personally appeared  $\underline{Jenvifer}_{\text{ripe}}$ , personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

) ss:

)

Notary Public ØState of New York Name: Natoya Duncan Qualified in Westchester County Registration No. 01DU6123076 Expiration: February 28, 2025

This document has been remotely notarized in accordance with Governor Cuomo's Executive Order Nos. 202.7, in a session conducted via video conference. At time of execution and notarization, the signee and the notary were both located in New York State.

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

By: Michael J. Ryan, Direc

Division of Environmental Remediation

#### Grantee's Acknowledgment

STATE OF NEW YORK ) ss: COUNTY OF ALBANY

On the  $\frac{74}{100}$  day of  $\frac{50}{100}$ , in the year 2021, before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Notary Public - State of New York

Dale L. Thiel Notary Public, State of New York Qualified in Columbia County Commission Expires February 2/22/2025 No 01TH6414394



## **SCHEDULE "A" PROPERTY DESCRIPTION**

All that certain plot, piece or parcel of land, situate, lying and being in the Borough and County of Queens, City and State of New York, bounded and described as follows:

Beginning at the corner formed by the intersection of the northwesterly side of Troutman Street and the northeasterly side of Woodward Avenue;

Running thence easterly along a line forming an interior angle of 90 degrees 08 minutes 09 seconds with the northeasterly side of Woodward Avenue 165.85 feet along the northwesterly side of Troutman Street;

Thence northerly at right angles to the northerly side of Troutman Street, 230.94 feet to the southerly side of Flushing Avenue;

Thence westerly along the southerly side of Flushing Avenue, 38.25 feet to a point;

Thence westerly along a line forming an interior angle of 165 degrees 51 minutes 52.4 seconds with the last mentioned course and continues along the southerly side of Flushing Avenue, 138.83 feet to the northeasterly side of Woodward Avenue;

Thence southerly along the northeasterly side of Woodward Avenue, 288.40 feet to the point or place of beginning.

Lot Area = 43,793.19 Sq. Ft. = 1.00535 acres.



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## LEGAL DESCRIPTION

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

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHWESTERLY SIDE OF TROUTMAN STREET AND THE NORTHEASTERLY SIDE OF WOODWARD AVENUE;

RUNNING THENCE EASTERLY ALONG A LINE FORMING AN INTERIOR ANGLE OF 90 DEGREES 08 MINUTES 09 SECONDS WITH THE NORTHEASTERLY SIDE OF WOODWARD AVENUE, 165.85 FEET ALONG THE NORTHWESTERLY SIDE OF TROUTMAN STREET;

THENCE NORTHERLY AT RIGHT ANGLES TO THE NORTHERLY SIDE OF TROUTMAN STREET, 230.94 FEET TO THE SOUTHERLY SIDE OF FLUSHING AVENUE;

THENCE WESTERLY ALONG THE SOUTHERLY SIDE OF FLUSHING AVENUE, 38.25 FEET TO A POINT;

THENCE WESTERLY ALONG A LINE FORMING AN INTERIOR ANGLE OF 165 DEGREES 51 MINUTES 52.4 SECONDS WITH THE LAST MENTIONED COURSE AND CONTINUING ALONG THE SOUTHERLY SIDE OF FLUSHING AVENUE, 138.83 FEET TO THE NORTHEASTERLY SIDE OF WOODWARD AVENUE;

THENCE SOUTHERLY ALONG THE NORTHEASTERLY SIDE OF WOODWARD AVENUE, 288.40 FEET TO THE POINT OR PLACE OF BEGINNING.

LOT AREA = 43,793.19 SQ.FT. = 1.00535 ACRES

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

## ENVIRONMENTAL EASEMENT DESCRIPTION

SITE #C241230 CONSENT INDEX #C-241230-03-19

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

BEGINNING AT THE CORNER FORMED BY THE INTERSECTION OF THE NORTHWESTERLY SIDE OF TROUTMAN STREET AND THE NORTHEASTERLY SIDE OF WOODWARD AVENUE;

RUNNING THENCE EASTERLY ALONG A LINE FORMING AN INTERIOR ANGLE OF 90 DEGREES OB MINUTES OP SECONDS WITH THE NORTHEASTERLY SIDE OF WOODWARD AVENUE, 165.85 FEET ALONG THE NORTHWESTERLY SIDE OF TROUTMAN STREET;

THENCE NORTHERLY AT RIGHT ANGLES TO THE NORTHERLY SIDE OF TROUTMAN STREET, 230.94 FEET TO THE SOUTHERLY SIDE OF FLUSHING AVENUE;

THENCE WESTERLY ALONG THE SOUTHERLY SIDE OF FLUSHING AVENUE, 38.25 FEET TO A POINT;

THENCE WESTERLY ALONG A LINE FORMING AN INTERIOR ANGLE OF 165 DEGREES 51 MINUTES 52.4 SECONDS WITH THE LAST MENTIONED COURSE AND CONTINUING ALONG THE SOUTHERLY SIDE OF FLUSHING AVENUE, 138.83 FEET TO THE NORTHEASTERLY SIDE OF WOODWARD AVENUE;

THENCE SOUTHERLY ALONG THE NORTHEASTERLY SIDE OF WOODWARD AVENUE, 288.40 FEET TO THE POINT OR PLACE OF BEGINNING.

LOT AREA = 43,793.19 SQ.FT. = 1.00535 ACRES

## SURVEYORS NOTES

1. THE ACCOMPANYING SURVEY WAS MADE ON THE GROUND AND CORRECTLY SHOWS THE LOCATION OF ALL BUILDINGS, STRUCTURES AND OTHER IMPROVEMENTS SITUATED ON THE ABOVE DESCRIBED PREMISES.

2. THE PROPERTY HAS DIRECT PHYSICAL ACCESS TO A PUBLIC STREET KNOWN AS FLUSHING AVENU8E, WOODWARD AVENUE AND TROUTMAN STREET. THERE ARE NO CHANGES IN STREET RIGHT OF WAYS.

3. THE RECORD DESCRIPTION OF THE PROPERTY FORMS A MATHEMATICALLY CLOSED FIGURE.

4. THERE IS NO VISIBLE EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

5. THERE IS NO VISIBLE EVIDENCE OF CEMETERIES.

6. THE SUBJECT PROPERTY DOES NOT LIE WITHIN A WETLANDS AREA.

NO. DATE /	REVISION
THE OF NEW LOPF	MAP OF PROPERTY SITUATED IN <b>RIDGEWOOD</b> QUEENS COUNTY, N.Y. NO. 151 WOODWARD AVENUE AND 1902 FLUSHING AVENUE TAX SECT.: 18 TAX BLOCK: 3376 TAX LOT(S): 1
SURVEYED: JUNE 27, 2020	Empire State Land Surveyor, P.C. Frank I. Galluzzo Professional Land Surveyor Records of Albert A. Bianco Stephen J. Reid - M. Berry Carman - G. W. Haviland Vandewater & Lapp - Robert E. Carlin - William J. Daly 1005 Glen Cove Avenue, Glen Head, NY, 11545 (516)-240-6901

APPENDIX B SITE CONTACT INFORMATION

Company	Individual Name	Title	Contact Number*
	Michelle Lanin	Remedial	646-388-9520
		Engineer	(office)
AKBE	Deborah Shaniro	Project	646-388-9544
AKM		Principal/QEP	(office)
	Patrick Diggins	Project Manager	914-922-2784
	I attlek Diggins	1 Tojeet Wanager	(office)
NVSDEC	Michael MacCabe	Project Manager	(518) 402-9687
		Troject Manager	(office)
NVSDEC	Sarah Quandt	Project Engineer	(518) 402-9116
		The formation of the second se	(office)
NVSDEC	Inno O'Connoll	Pagional Chief	(718) 482-4599
IN I SDEC	Jane O Connen	Regional Chief	(office)
NYSDOH	Stavan Parningar	Project Manager	(518) 369-9698
NTSDOH	Steven Berninger	Floject Manager	(mobile)
PCB Volunteer	Risa Weinstock, 1906	Volunteer's	(646) 996-7568
BCF Volunteer	Flushing LLC	Representative	(office)
Medical, Fire, Police	N/A	N/A	911
			(800) 272-4480
One Call Contain			(3-day notice
One Call Center	N/A	IN/A	required for
			utility mark out)
Poison Control Center	N/A	N/A	(800) 222-1222
Pollution Toxic Chemical Oil Spills	N/A	N/A	(800) 424-8802
NYSDEC Spills Hotline	N/A	N/A	(800) 457-7362
*Note: Contact numbers are subject to	change and will be updat	ted as necessary.	/

## LIST OF SITE CONTACTS

APPENDIX C

**RESPONSIBILITIES OF OWNER AND REMEDIAL PARTY** 

## **RESPONSIBILITIES OF OWNER AND REMEDIAL PARTY**

## **Responsibilities**

The responsibilities for implementing the Site Management Plan ("SMP") for the Queens Animal Shelter and Care Center site (the "Site"), BCP Site Number C241230, are divided between the Site owner and a Remedial Party, as defined below. The Site owner is/are currently listed as:

1906 Flushing LLC 11 Park Place, Suite 805 New York, NY 10007

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, participant, applicant, responsible party, and, in the event that the New York State Department of Environmental Conservation ("NYSDEC") is carrying out remediation or site management, NYSDEC and/or an agent acting on its behalf. The RP is:

1906 Flushing LLC 11 Park Place, Suite 805 New York, NY 10007

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the Site.

### Site Owner's Responsibilities:

- 1. The owner shall follow the provisions of the SMP as they relate to future construction and excavation at the Site.
- 2. In accordance with a periodic time frame determined by NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the Site's Periodic Review Report (PRR) certification to NYSDEC.
- 3. In the event that the Site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by NYSDEC, a written certification that the Environmental Easement is still in place and has been complied with.
- 4. The owner shall grant access to the Site to the RP and NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.
- 5. The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. If damage to the remedial components or vandalism is evident, the owner shall notify the Site's RP and NYSDEC in accordance with the timeframes indicated in Section 1.3 Notifications.
- 6. If some action or inaction by the owner adversely impacts the Site, the owner must notify the Site's RP and NYSDEC in accordance with the timeframe indicated in Section 1.3– Notifications and coordinate the performance of necessary corrective actions with the RP.
- 7. The owner must notify the RP and NYSDEC of any change in ownership of the Site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the Site property. 6 NYCRR Part 375 contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is

the following: 60 days prior written notification must be made to NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 1.3 of the SMP. A change of use includes, but is not limited to, any activity that may increase direct human or environmental exposure (e.g., day care, school or park). A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

- 8. Until such time as NYSDEC deems the vapor mitigation system unnecessary, the owner shall operate the system, pay for the utilities for the system's operation, and report any maintenance issues to the RP and NYSDEC.
- 9. In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data that is produced with respect to structures and that exceeds NYSDOH or OSHA guidelines on the Site, whether produced by NYSDEC, the RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

## **Remedial Party Responsibilities**

- 1. The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at the Site.
- 2. The RP shall report to NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, PRRs and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.
- 3. Before accessing the Site property to undertake a specific activity, the RP shall provide the owner advance notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the Site visit and/or any final report produced.
- 4. If NYSDEC determines that an update of the SMP is necessary, the RP shall update the SMP and obtain final approval from NYSDEC. Within 5 business days after NYSDEC approval, the RP shall submit a copy of the approved SMP to the owner(s).
- 5. The RP shall notify NYSDEC and the owner of any changes in RP ownership and/or control and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (Engineering Controls). The RP shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60 days prior notice to NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.
- 6. The RP shall notify NYSDEC of any damage to or modification of the systems as required under Section 1.3 Notifications of the SMP.
- 7. The RP is responsible for the proper maintenance of any installed vapor intrusion mitigation systems associated with the Site, as required in Sections 4 and 5 (Monitoring and Sampling Plan, and Operation and Maintenance Plan) of the SMP.
- 8. The RP is responsible for the proper monitoring and maintenance of any installed drinking water treatment system associated with the Site, as required in Sections 4 and 5 (Monitoring and Sampling Plan, and Operation and Maintenance Plan).
- 9. Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to NYSDEC for approval an amended SMP.

10. Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the Site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. The RP shall contact the NYSDEC project manager to discuss the need to update such documents.

Change in RP ownership and/or control and/or Site ownership does not affect the RP's obligations with respect to the Site unless a legally binding document executed by NYSDEC releases the RP of its obligations.

Future Site owners and RPs and their successors and assigns are required to carry out the activities set forth above.

APPENDIX D

RI AND SRI SOIL BORING LOGS AND MONITORING WELL CONSTRUCTION LOGS

## **Borehole Completion/Monitoring Well Installation Log**



AKRF Project ID 180291

Boring ID RI-SB/MW-01

Start Time End Time Drilling Metho Sampling Me	id thod	12/4/2018 2:15:00 PM 12/4/2018 2:40:00 PM Geoprobe 5' Macrocore	Driller Weather Logged By	ADT 40°F, Cle J. Menke	ear en, AKRF	Lat Lor Sur (NAV	itude igitud face E <sup>(D 88)</sup>	e Elev. (ft)	40.712380 -73.918000 31.15
EPTH (ft) COVERY (in)	hology	Soil Descrip Surface Condition:	otion Concrete		орок	JISTURE	(mqq) D	NAPL	Sample ID

DE	REC	Ē	Surface Condition. Concrete				0	IOW	₽	Z	•
0-				0—		FLUSHMOUNT LOCKING				Divit	
	38		Brown SAND some			JPLUG	ND	DRY		Petroleum	RI-SB-01_0-2_20181204
			Glass, Ash, fine fine	'_							
2_				2_							
3-				3—						ND	
4-	-			4—							
5-				5-							
	24		Brown SAND, some fine fine Gravel, Glass, Ash,				ND	DRY	ND	ND	
	-		trace Silt, Coal.			BACKFILL					
7_	1			7_		2" SOLID PVC WELL RISER					
8-	-			8—							
9-				9—							
10-				10-			ND	DD)/			
11_	35		Brown SAND, some Silt, trace fine fine Gravel,				ND	DRY	ND	ND	RI-SB-01_10-12_20181204
	-		Concrete, Brick.	<u> </u>							
12-	1			12-							
13_				13—		BENTONITE					
14-	-			14—	- 72.6 - 72.6 - 72.6						
			Diagk CAND, some Silt	15—	: X6 : X6 : X6		ND	DDV			
16-	50		fine fine Gravel, trace	16-	: X6 : X6 : X6		ND	WET		ND	
	-		Coal.		: X6 : X6 : X6 : X6						RI-SB-01_16-18_20181204
	1		Brown SAND some Silt	$^{17}$	: X6 : X6 : X6 : X6						
18_			trace fine fine Gravel.	18—	100 100 100	· 建一					
19-	-	, _ , , , , , , , , , , , , , , , , , ,		19—	2 X 4 2 X 4 2 X 4	ANO. 2 MORIE SAND PACK					
20-				20—	2 X6 2 X6 2 X6	2" PVC 20 SLOT WELL SCREEN					
21-	1			21—	- X6 - X6 - X6						
	1	, , , , , , , , , , , , , , , , , , ,		22	: X6 : X6 : X6						
<u> </u>	-			<u> </u>	2 X6 2 X6						
23-	1			23-							
24_	1			24	- 44 - 24 - 24						
25-				25—		End Cap					
	Nativ	/e	Surface								

Fill

Notes:

Stabilized groundwater measured at 15.6 feet below top of casing on 12/27/2018. Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are using the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

## **Borehole Completion/Monitoring Well Installation Log**



AKRF Project ID 180291

Boring ID RI-SB/MW-02

												10 710500		
Start Time <u>12/10/201811:00:00 AM</u>					/	_ Driller <u>ADT</u>			Latitude <u>40.712530</u> -73.917860					
End Tim	d Time <u>12/10/201811:25:00 AM</u>				Λ	Weather 40°F, Clear				Longitude $-73.317000$				
Drilling N	letho	b	Geoprobe		Logged By	en, AKRF	Sul (NA)	1ace c /D 88)	ziev. (i					
Sampling	n Metl	hod	5' Macrocore						,	,				
Camping	y wica	lou												
Ш Н	(ER)	ogy	Soil	Des	scrip	iption		R	'URE	(mqq	7	Semale ID		
DEPT	Ū.	ithol	Surface Cor	nditi	on: (	Concrete		Ö	SIOI	<u> </u>	NA	Sample ID		
	R			0_		FLUSHMOUNT	LOCKING		2	<u> </u>				
	35	$\langle \rangle \rangle$	CONCRETE SLAB			v		ND	DRY	10.0	Petroleum sludge	RI-SB-02_0-2_20181210		
			and GRAVEL, some				51 200				on surface			
2_			Brown SAND, some	2—							ND			
3–			Silt, Coal, Glass, trace fine Gravel.	3—						ND				
4-				4—		<b>ا</b>	BACKFILL							
5				5-		🗣 2" SOLID PVC WE	LL RISER	ND	D D V					
	41	$\backslash /$	SLOUGH	6				ND	DRY	0.5 ND	ND			
<u> </u>		,	Brown SAND, some Silt, trace fine Gravel.							5.9				
/]		<i>;;</i> ,		/_										
8_		, , , , , , , , , , , , , , , , , , ,		8		<b>◄</b> ──── BE	NTONITE					RI-SB-02_8-10_20181210		
9—		, , , , , , , , ,		9—	1919									
10	51	;,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Brown SAND some Silt	10—	1 M4 1 M4 1 M4			ND	DRY	ND	ND	RI-SB-02 10-12 20181210		
11-	0.	, <i>, , ,</i> ,	trace fine Gravel.	11-	1.84 1.84 1.84 1.84				Brtt					
12		, <i>, , , ,</i>			2 X 6 2 X 6 2 X 6 2 X 6 2 X 6	28 26 28 26								
		, , , , , , , , , , , , , , , , , , ,		13_	149 149 149	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)								
		, <i></i> ,												
		, , , , , , , , , , , , , , , , , , ,		14 —	2.86 2.86 2.86	➡ NO. 2 MORIE SA ■ 2" PVC 20 SL0	ND PACK OT WELL							
	32	· , , , , , , , , , , , , , , , , , , ,	Brown SAND, some Silt,	15—	2.86 2.86 2.86		SCREEN	ND	DRY	ND	ND			
16-			trace fille Gravel.	16—	2.00 2.00 2.00 2.00			-	WET					
17-		; ; ; ; ;		17—	: X4 : X4 : X4 : X4									
18-		, <i>, , ,</i> ,			126 149 149									
19-		, , , , , , , , , , , , , , , , , , ,		 19—		使 使 一								
		<i>' ,` '</i>		20-	1.24 1.24		- End Cap							
				21-										
22				22-										
23_				23										
24-				24—										
25														
	Nativ		Surface					I		1				

Native

Fill

Notes:

Stabilized groundwater measured at 15.8 feet below top of casing on 12/31/2018 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are using the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

## **Borehole Completion/Monitoring Well Installation Log**

**CAK**RF

AKRF Project ID 180291

Boring ID RI-SB/MW-03

Start Tim	ıe		12/10/20182:10:00 PM Driller ADT						Latitude <u>40.712330</u>					
End Tim	Time <u>12/10/20182:35:00 PM</u> Weathe				Weather	40°F, Cl	ear	Longitude <u>-73.917930</u> Surface Elev (ff) 31.67						
Drilling N	lethoo	b	Geoprobe Logged By J. Menken, AK						(NAVD 88)					
Sampling	a Meth	nod	5' Macrocore		_									
£	ž	~	Soil	Dee	orin	tion			SE	Ê				
PTH (	(in) EVE	polor	Surface Cor	ditio	511µ n• (	Concrete		DOR	ISTUI	(ppr	IAPL	Sample ID		
DE	REC	Lit	Surface Cor			Souciere		0	OW		2			
0_	25		CONCRETE SLAB	0		FLUSHMOUNT	LOCKING VELLBOX	ND	DRY	7.0	Petroleum-like	RI-SB-03_0-2_20181210		
1_			Brown SAND, some fine Gravel, trace Silt, Brick,	1—			- JPLUG				staining ND			
2-			Ash.	2—										
3-				3—										
4-				4—			BACKFILL							
5	25			5			II RISER	ND	DBY					
6	35		Gravel, trace Silt, Brick,	6				ND	DRY	0.8	ND			
7				7										
。 一				, 										
<u> </u>						ве	NTONITE							
.9–				9_	23 26 26									
10	60		CONCRETE and SOIL	10-	24 24 24			ND	DRY	7.0	ND	RI-SB-03_10-12_20181210		
11_			Brown SAND, some fine	11—										
<b>√</b> 2_			Gravel, trace Silt, Brick,	12	49 49 49			-	MET					
13_				13—	# # # #				VVEI					
14_				14—	26 26 26									
15-	51		SLOUGH	15—	26 26 26 26	NO. 2 MORIE SA 2" PVC 20 SL	ND PACK OT WELL	ND	WET	11.4	ND			
16-		(/. ,	Brown SAND, some Silt,	16—	X4 X4 X4		SCREEN			68.5		RI-SB-03 16-18 20181210		
17-		, , , , , , , , , , , , , , , , , , ,	trace fine Gravel.	17—	X4 X4 X4					00.0				
18-		, <i>, , ,</i> ,			24 47 47									
19-		; <i>; ;</i> ;		 19	45 43 26 26									
20-		, , , , , _ , ,		20	24 24 24									
21				$\begin{bmatrix} 1 \\ 2 \end{bmatrix}_{21}$			- End Cap							
2'				22										
23-				23										
24				24—										
25-				25—										
	Vativ	е	Surface											

Stabilized groundwater measured at 12.4 feet below top of casing on 12/15/2018

Soil samples submitted for laboratory analysis.

Fill

Notes:

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are using the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.


AKRF Project ID 180291

Boring ID RI-SB/MW-04

Start Time12/6/20181:55:00 PMEnd Time12/6/20182:20:00 PMDrilling MethodGeoprobeSampling Method5' Macrocore			12/6/2018 1:55:00 PM 12/6/2018 2:20:00 PM Geoprobe 5' Macrocore	Driller ADT Weather <u>40°F, Cl</u> Logged By <u>J. Menk</u>	ear en, AKRF	Lati Lor Sur (NAV	itude igitud face E 'D 88)	e Elev. (f	40.712440 -73.917820 t) 31.40
DEPTH (ft)	RECOVERY (in)	Lithology	Soil Desc Surface Conditior	ription I: Concrete	ODOR	MOISTURE	PID (ppm)	NAPL	Sample ID
0 1 2 3 4 4	27		CONCRETE SLAB Dark Brown SAND, some Silt, trace Coal, Brick, Concrete, fine Gravel, Metal Shards.	FLUSHMOUNT LOCKING WELLBOX JPLUG	ND	DRY	14.7 ND	Petroleum sludge on surface	RI-SB-04_0-2_20181206 RI-SB-34_0-2_20181206
5 6 7 7 8 9	45		SLOUGH 5 Brown SAND, some fine Gravel, trace Brick, Silt, Glass. 7 9 9	BACKFILL	ND	DRY	ND	ND	

10-				10—							
11	51		Brown SAND, some fine Gravel, trace Brick, Silt,				ND	DRY	ND	ND	RI-SB-04_10-12_20181206
			Glass.								
12-				12—							
13-				13—							
14_				14—	: X6 : X6 : X6						
15-	54		Brown SAND some fine	15—			ND	DRY	ND	ND	
	04		Gravel, trace Brick, Silt,		: X6 : X6		ND	DINI			
			Glass.		(漢) (漢) (漢)			WET			RI-SB-04_16-18_20181206
17				17—							
18-				18—							
19-				19—		NO. 2 MORIE SAND PACK					
20-				20—	136 136 136	SCREEN					
	45		Brown SAND, some fine Gravel, trace Brick, Silt,		2.86 2.86 2.86		ND	WEI	ND	ND	
21			Glass.	21-	236						
22-			Dark grav SAND, some	22—							
23-			Silt, trace fine Gravel.	23—	26 : 26 : 26 : 26						
24		, , , , , , , , , , , , , , , , , , ,		 24—	: X6 : X6 : X6						
25				 25—	100 M	End Cap					

Native

Surface

Fill

Notes:

Stabilized groundwater measured at 16.0 feet below top of casing on 12/28/2018 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

MAKRF

AKRF Project ID 180291

80291

Boring ID RI-SB/MW-05

Start Tin	пе		12/7/2018 8:35:00	AM (	_	Driller	ADT		Lat	itude		40.712550
End Tim	е		12/7/2018 9:00:00	AM (	_	Weather <u>40°F, Clear</u>			Lor Sur	face E	e Elev. ( <sup>.</sup>	(13.917700 (131.45)
Drilling N	lethoo	b			-	Logged By <u>J. Menken, AKRF</u>				/D 88)	,	,
Sampling	g Metl	hod	5' Macrocore		-							
PTH (fi	OVEF (in)	lology	Soil Surface Cor	Soll Description Surface Condition: Concrete				DOR	STUR	mqq)	IAPL	Sample ID
DE	REC	Lit	Surface Col		1. COI			0	юw		z	-
0_	33		CONCRETE SLAB					ND	DRY	ND	Petroleum-like staininn	RI-SB-05_0-2_20181207
1			Dark Brown SAND, some Silt, trace fine Gravel Brick Coal Ash				- JPLUG			4.1	ND	
2-				2-								
				3-								
4												
5-	44			5-		·	BACKFILL	ND	DRY	ND	ND	
6					42	" SOLID PVC WE	LL RISER					
9 10												
11_	35			11		——— ВЕ		ND	DRY	ND	ND	RI-SB-05_10-12_20181207
12-				12	226							
13-				13—								
14-				14—	100							
	38			15—		NO. 2 MORIE SA 	ND PACK	ND	MOIST			
16-	30		Brown SAND, some Silt,	16—			SCREEN		WET			PI-SB-05 16-18 20181207
17-		, , , , , , , , , , ,		17—	31		5 1 0					
18-		, , , , ,		18—	_		- End Cap					
19-				 19—								
20-	52	, , , , , , , , , , , , , , , , , , ,	SLOUGH	20—				ND	WET	ND	ND	
21		· ,		21						2.8	1	
22			Dark Brown SAND, some Silt, fine Gravel.	22								
23				23								
24_				24								
25-				25—								
	Nativ	e	Surface									
	Fill											

Notes:

Stabilized groundwater measured at 15.4 feet below top of casing on 12/28/2018 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

MAKRF

AKRF Project ID 180291

12

13-

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17.

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22-

23

24

 $25^{-1}$ 

Notes:

58

52

Native

Fill

80291

Boring ID RI-SB/MW-06

Start Time12/6/20187:50:00 AMEnd Time12/6/20188:15:00 AMDrilling MethodGeoprobeSampling Method5' Macrocore				Driller <u>ADT</u> Weather <u>40°F, CI</u> Logged By <u>J. Menk</u>	ear en, AKRF	Lat Lor Sur (NA)	itude ngitud face E /D 88)	e Elev. (f	40.712370 -73.917600 t) 31.62
DEPTH (ft)	RECOVERY (in)	Lithology	Soil Desci Surface Condition	<b>iption</b> : Concrete	ODOR	MOISTURE	PID (ppm)	NAPL	Sample ID
	30		CONCRETE SLAB Dark Brown SAND, some fine Gravel, trace Silt, Concrete. Brown SAND, some Silt.	FLUSHMOUNT LOCKING WELLBOX	Petro-like	DRY	19.5	Petroleum-Ike staining ND	RI-SB-06_0-2_20181206
5 6 7 8 9 10	42		Brown SAND, some Silt.	BACKFILL	Petro-like Petro-like	DRY	21.2 0.7 5.7	ND	RI-SB-06_5-7_20181206 RI-SB-06_10-12_20181206

BENTONITE

NO. 2 MORIE SAND PACK

2" PVC 20 SLOT WELL SCREEN

- End Cap

ND

Sweet

WET

WET

ND

0.4

ND

ND

ND

RI-SB-06\_16-18\_20181206

Stabilized groundwater measured at 14.9 feet below top of casing on 12/28/2018 Soil samples submitted for laboratory analysis.

Surface

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

13

14

15-

16-

17

18-

19-

20.

21-

22-

23.

24

25-

Gray SAND, some Silt.

Brown SAND, some fine Gravel.

Brown SAND, some fine Gravel.



AKRF Project ID 180291

Boring ID RI-SB/MW-07

Start Time12/6/2018 10:10:00 AMDrillerEnd Time12/6/2018 10:35:00 AMWeatheDrilling MethodGeoprobeLoggedSampling Method5' Macrocore	ADT Latitude r <u>40°F, Clear</u> Surface Ele By <u>J. Menken, AKRF</u> (NAVD 88)	40.712450 -73.917500 ev. (ft) 31.27
---	---	---



Fill

Notes:

Stabilized groundwater measured at 18.9 feet below top of casing on 12/31/2018 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

CAKRF

AKRF Project ID 180291

Boring ID RI-SB/MW-08

Start Time End Time Drilling Method Sampling Method	12/4/2018 1:55:00 PM 12/4/2018 2:20:00 PM Geoprobe 5' Macrocore	Driller Weather Logged By	ADT 40°F, Clear J. Menken, AKRF	Latitude Longitude Surface Elev. (ft) (NAVD 88)	40.712020 -73.917550 34.92



Fill

Notes:

Stabilized groundwater measured at 16.6 feet below top of casing on 12/13/2018

Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

CAKRF

AKRF Project ID 180291

Boring ID RI-SB/MW-09

Start Time12/4/201811:50:00 AMEnd Time12/4/201812:50:00 PMDrilling MethodGeoprobeSampling Method5' Macrocore	Driller <u>ADT</u> Weather <u>40°F, Clear</u> Logged By J. Menken, AKRF	Latitude 40.712170 Longitude -73.917380 Surface Elev. (ft) 33.44
--	---	--



Surface

Fill

Notes:

Stabilized groundwater measured at 15.0 feet below top of casing on 12/13/2018 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected



AKRF Project ID 180291

Boring ID RI-SB/MW-10

Start Tin	ne		12/4/2018 10:00:00 AM	Driller	ADT		Lati	tude		40.712350		
End Tim	е		12/4/2018 11:45:00 AM	Weather '	Weather 40°F, Clear			gitud		-73.917330		
Drilling N	- lethoo	d .	Geoprobe	Logged By	Logged By J. Menken, AKRF			(NAVD 88)				
Sampling	n Meti	hod	5' Macrocore									
Camping	y wieu	iou .										
( <b>t</b> )	۲	~	0.11 D				щ	2				
TH (f	in) CFF	logy	Soll Desc	ription		OOR	STUR	nqq)	APL	Sample ID		
DEP	REC	Lith	Surface Condition	: Concrete		ō	NOI	DIA	z			
0—	35		CONCRETE SLAB		DCKING ELLBOX	ND	DRY	ND	Petroleum-like	RI-SB-10 0-2 20181204		
1-					JPLUG				staining			
2-			Prown SAND some Silt 2-							PI SP 33 0 2 20181204		
3-			little fine Gravel.							[KI-3D-35_0-2_20101204		
4												
- 5-								<u>1.7</u> 0.1				
<u> </u>	40		SLOUGH	ВА	CKFILL	ND	DRY	1.7	ND			
<u>_</u>			Brown SAND, trace Silt, 6	2" SOLID PVC WELL	RISER			0.5				
(-								NB				
8_		, , , , , , , , , , , , , , , , , , , ,				Sweet						
9_			9-									
10_	37		SLOUGH 10			ND	DRY	2.2	ND			
11—			11—					6.1 ND				
12-			Brown SAND, some Silt, 12-	BEN	TONITE			110				
13-		<i></i>	13							RLSB-10 13-15 20181204		
14-										10-10-10-10-10-20101204		
	47					ND			ND			
16-	47		trace fine Gravel.			ND	VVEI	ND	ND			
17-			17-							RI-SB-10_10-18_20181204		
18-		, , ,		NO. 2 MORIE SAN								
19-					SCREEN			1.0				
20-			Red/Brown SAND, some 20									
20	58		Slit, trace fine Gravel.			ND	WET	ND	ND			
		, , , , , , , , , ,										
								0.6 ND				
23-			Brown SAND, some Silt, 23		End Cap							
24_		/	24—									
25-		~~~	25-									

Native

Surface

Fill

Notes:

Stabilized groundwater measured at 15.3 feet below top of casing on 12/13/2018 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

			Borehole Comple	tion Log			7	AKRE
AKRF Pro	oject	ID <u>180291</u>	Boring ID RI-SB-11					ANIU
Start Time End Time Drilling Met Sampling M	hod Aethoo	12/7/2018 12/7/2018 Geoprobe 5' Macrocore	Driller <u>ADT</u> Weather <u>40°F, (</u> Logged By <u>J. Mer</u>	Clear ken, AKRF	Latitu Longi Surfac (NAVI	de tude ce Ele D 88)	v. (ft)	40.712472 -73.917938 29.93
DEPTH (ft)	(in)	Surface Co	Soil Description ndition:Concrete	ODOR	MOISTURE	PID (ppm)	NAPL	Sample ID
0-2 1-2 2-3-3-	22	CONCRETE SLAB Black SAND, some Silt	, fine Gravel, trace Brick, Ash, Coal.	, ND	DRY	ND	Petroleum-like staining ND	RI-SB-11_0-2_20181207

DRY

DRY

DRY

WET

WET

ND

ND

ND

ND ND

ND

ND

ND RI-SB-11\_10-12\_20181207

RI-SB-11\_16-18\_20181207

ND

ND

ND

ND

Black SAND, some Silt, fine Gravel, trace Brick, Ash, Coal.

Brown SAND, some Silt, trace fine Gravel.

Brown SAND, some Silt, trace fine Gravel.

Brown SAND, some Silt, trace fine Gravel.

Black SAND, some Silt, trace fine Gravel.

Brown SAND, some fine Gravel, trace Silt.

Brown SAND, some fine Gravel, trace Silt.

Native

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Fill 📈

Groundwater encountered at approximately 18.0 feet below grade. Soil samples submitted for laboratory analysis.

5-

6-7-8-9-

10-

11-12-13-14-15-

16

17

18

19-20-

21-22-23-24-25-

Notes:

36

40

29

52

Soil classifications and descriptions presented are using the Modified Burmister Classification System.	Descriptions were developed for environmental
purposes only.	

Surface

Borehole Completion	Log		-	ALTOD					
AKRF Project ID 180291 Boring ID RI-SB-12		CAKRE							
Start Time12/7/2018DrillerADTLatitude40.712291End Time12/7/2018Weather40°F, ClearLongitude-73.917790Drilling MethodGeoprobeLogged ByJ. Menken, AKRF(NAVD 88)Sampling Method5' MacrocoreMacrocore-73.917790									
Image: With the second seco	ODOR	MOISTURE PID (ppm)	NAPL	Sample ID					
0 9 CONCRETE SLAB 1 Brown SILT, some Sand.	ND D	RY ND	Petroleum-like staining ND						

ND

ND

ND

ND

DRY ND ND

ND

ND

ND

ND

ND

ND

DRY

DRY

WET

RI-SB-12\_9-11\_20181207

RI-SB-12\_13-15\_20181207

RI-SB-12\_16-18\_20181207

3--4-

5-6-7-8-

9.

10-

11

12-13-

14-15-

16

Notes:

8

31

37

56

Brown SILT, some Sand.

Brown SAND, some Silt.

Brown SAND, some Silt, fine Gravel.

Brown SAND, some fine Gravel, Silt.

Brown SAND, some fine Gravel, Silt.

Native

Fill 📈

Groundwater encountered at approximately 20.0 feet below grade. Soil samples submitted for laboratory analysis.

Surface

		Borehole Comple	tion Log			-	
AKRF Projec	t ID <u>180291</u>	Boring ID RI-SB-13	Boring ID RI-SB-13				AKRF
Start Time End Time Drilling Method Sampling Meth	12/10/2018 12/10/2019 Geoprobe od 5' Macrocore	Driller ADT Weather 40°F, C Logged By J. Men	lear ken, AKRF	Latitud Longit Surfac (NAVI	de ude e Elev ) 88)	v. (ft)	40.712493 -73.917566 34.35
H (ft) /ERY )	ology	Soil Description	R	URE	(ud	2	

	DEPTH	RECOV (in	Litho	Surface Condition:Concrete	ODO	MOIST	d) OI 4	NAF	Sample ID
	0-	38		CONCRETE SLAB	Organic	DRY	ND	Petroleum-like	RI-SB-13 0-2 20181210
				Brown SAND some Silt trace fine Gravel Wood Ash			14.7	staining	
	2-	1					1.7		
	3-			Dark Brown SAND, some fine Gravel, trace Silt, Ash	-				
	4-	1							
	5	34		Dark Brown SAND, some fine Gravel, trace Silt, Ash	Organic	Moist		ND	
	6-				Organic	WOISt	1.5		
	7-	1		Rrown SAND some Silt trace fine Gravel Brick	-				
	 8-	1							
	9- 9-	1							
		12		Brown SAND, some Silt, trace fine Gravel	ND	Moist			PI SB 13 10 12 20181210
		42			ND	WOISt		ND	11-00-13_10-12_20101210
		1							DI SD 25 10 12 20181210
		1		White SAND, Silt, fine Gravel.					<u>KI-30-33_10-12_20101210</u>
	 14			Brown SAND, some Silt, trace fine Gravel.					
			<i>.,</i> ,,	Drown SAND, come Silk trace fine Crows	ND				
		54		BIOWN SAND, Some Sill, trace line Gravel.	ND			ND	
	17-	1							RI-SB-13_10-18_20181210
		1	, ', , '',						
	19-		· ,	Red/Brown SAND, some Silt.	-	VVEI			
	20-		, ,		ND				
	21-	60	','' ,,''	Brown SAND, some Sill, trace line Gravel.	ND	VVEI		ND	
	22-	1	, , , , , , , , , , , , , , , , , , ,						
	23-	1	, , , , , , , , , , , , , , , , , , ,						
	24-	1	, , , , , , , , , , , , , , , , , , ,						
	25-	·	, <u>, , ,</u> ,						
Ī				Fill Kative Surface		-	-		
	Notes	s:							
	Groui Soil s	ndwate	r enco s subr	ountered at approximately 18.0 feet below grade. nitted for laboratory analysis.					
	PID =	photoi	onizat	tion detector _ppm = parts per million_NAPL = non-aqueous phase liquid_ND	) = not detected	ł			
				1. East E					

	Borehole Completion Log           Image: RF Project ID 180291         Boring ID RI-SB-14													
AKRF I	Image: CRF Project ID 180291       Boring ID       RI-SB-14         Image: Art Time       12/7/2018       Driller       ADT       Latitude       40.712163         Ind Time       12/7/2018       Driller       ADT       Latitude       40.712163         Image: Method       Geoprope       Weather       40°F, Clear       Longitude       -73.917611													
Start Tir	me		12/7/2018 Driller <u>ADT</u>		Latitud	de		40.712163						
End Tim	ne Motho	4	12/7/2018 Weather 40°F, Clear		Surfac	e Ele	v. (ft)	36.05						
	vietno	ב י	5' Macrocore	<u>KRF</u>	(NAVE	D 88)								
Samplin	g Met	nod												
	الله الله الله الله الله الله الله الله													
(ff)	RУ	ygy	Soil Description	~	RE	Ê								
DEPTH	RECOVE (in)	Lithole	Surface Condition:Concrete	ODO	MOISTU	dd) Old	NAPL	Sample ID						
0_	40		CONCRETE SLAB	ND	DRY	ND	Petroleum-like staining	RI-SB-14_0-2_20181207						
1-	1		Dark Brown SAND, some Silt.			0.3 ND	ND							
2-	1													
	1													
4-														
	47		Brown SILT, some Sand, trace Brick.	ND	DRY	ND	ND							
8-	1													
9-														
10-	35	$\sum_{i}$	SLOUGH	ND	DRY	ND	ND	RI-SB-14 10-12 20181207						
11-			Gray SILT.	1										
12_		, , , , , , , , , , , , , , , , , , ,												
13_														
	1													
	52		SLOUGH Brown SAND, some fine Gravel, Silt	, ND	DRY	ND	ND							
10		, ' , , ' ,			WET			RI-SB-14_16-18_20181207						
		, , , , , , , , , , , , , , , , , , ,												
19-														
20-	50	, <i>, , ,</i> ,		ND				-						
21-	- 20		Brown SAND, some line Gravel, Silt.	ND	VVEI									
22-	1	, <u>, , ,</u> ,												
23-														
24_														
25-		<i></i>						1						
NI-L	<b>.</b> .		Fill 📈 Native 🚃 Surface 🔣											
Notes	5. 		undered at approximately 16.0 feet below mode											
Soil s	amples	subn	nitted for laboratory analysis.											

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

SOIL BO	RING AND WELL LLATION LOG	Queens Anima 151 Woodwa	I Shelter and Care Center rd Avenue, Queens, NY	Moi	Groundwater nitoring Well ID:		SF	RI-MV	V-11		
		Drilling Method:		Drilling	Sheet 2 of 2		_	_		_	_
$\mathcal{O}$	<b>AK</b> RF	Sampling Method:	Plastic sleeve	Start Ti	i <b>me:</b> 12:45			Finish Ti	<b>me:</b> 13:50		
440 Park	Avenue South, 7th Floor	Driller: Weather:	ADT 85 °F. sunnv		07/00/0010						
New	v York, NY 10016	Logged by:	D. Kardashian, AKRF	Date:	07/30/2019		1			_	
Depth (feet)	Well Construction	Surface	Condition: Concrete	Recovery (Inches)	Soil Bori	ing Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1 2 3 3		2" diameter F below grade	VC well casing: 0' to 12'	NA	Top 36": Black to brow and SILT, trace plastic Bottom 24": Black to br and SILT (fill)	n coarse SAND ;, asphalt (fill) rown coarse SAND	None	Dry Dry	ND	None	
<u>4</u>											
- <u>    6                                </u>				60	Brown coarse SAND a Gravel	nd SILT, little	Weathered petroleum- like	Dry	ND	None	
<u>9</u>											
<u>11</u>			slotted PVC well screen: elow grade		Brown coarse SAND a Gravel	nd SILT, little	None	Wet	ND	None	
<u>13</u>		0.020-inch slo 12' to 22' belo		60							
<u> </u>					Top 12": Brown SILT, s Sand	some Clay,	None	Wet	ND	None	
- <u>18</u> . <u>19</u> 20				60	Bottom 24": Brown SIL Sand	T, some Clay,	None	Wet	ND	None	
Notes: Groundwat	tes: Groundwater Depth Indicator oundwater measured at 11 feet below grade.				samples analyzed Iwater encountered at	approximately 10 fee	t below grad	e during s	oil boring	installatio	on.
Groundwat	PID = phote	oionization detec	tor NAPL = no	n-aqueo	son boring at 22 feet b us phase liquid	ppm = parts per	r million	ND	= not det	ected	
Soil classific	cations and description	ns presented are b	ased on the Modified Burm	ister Clas	ssification System. Desc	riptions were develop	ed for environr	mental purp	poses only		

SOIL BORING AND	WELL	Queens Anima	Shelter and Care Center	Mo	Groundwater nitoring Well ID:							
INSTALLATION I	LOG	AKRF Pro	piect Number: 180291		Sheet 2 of 2		ì	SKI-IV	100-11	l		
		Drilling Method:	Sonic	Drilling								
<b>MAK</b> RI	⊣"	Sampling Method:	Plastic sleeve	Start Ti	me: 12:45			Finish Ti	<b>me:</b> 13:50			
140 Park Avenue South 7th	h Eleor	Driller:	ADT									
440 Park Avenue South, 7th Floor New York, NY 10016         9       Well Construction         22       22         22       23         24       24         25       26         27       28		Weather: Logged by:	D. Kardashian, AKRF	Date:	07/30/2019							
(1994) Well Const de D	truction	Surface	Condition: Concrete	Recovery (Inches)	Soil Boring	Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis	
		End cap: 22' b	pelow grade		Brown SILT, some Clay	v, coarse Sand	None	Wet	ND	None		
23		Lind Cup. 22	ción grade	36	Refusal at 22 feet on a	cobble						
24												
26												
27												
28												
<u>29</u>												
<u>31</u>												
33												
<u>34</u>												
35												
<u>36</u>												
<u>39</u>												
40												
Notes: V Grou Groundwater measured	otes: Groundwater Depth Indicator roundwater measured at 11 feet below grade					No soil samples analyzed Groundwater encountered at approximately 10 feet below grade during soil boring installation						
Groundwater monitorin	istalled to 22 feet	soil boring at 22 feet be	elow grade.	-	-	-	<b>U</b>					
PID = Soil classifications and d	escription	nization detector	NAPL = non-a	1-aqueous phase liquid ppm = parts per million ND = not detected								

SOIL BOR	RING AND WELL	Queens Anima 151 Woodwa	I Shelter and Care Center rd Avenue, Queens, NY	Mo	Groundwater nitoring Well ID:		s	RI-M	W-12		
		AKRF Pro	oject Number: 180291		Sheet 2 of 2						
$\sim$	<b>K</b> BE	Drilling Method:	Sonic	Drilling							
	<b>IN</b> IU'	Driller:	ADT	Start Ti	ime: 13:05			Finish Tiı	<b>ne:</b> 14:45		
440 Park A	venue South, 7th Floor	Weather:	85 °F, sunny	Dato <sup>.</sup>	07/20/2010						
New	York, NY 10016	Logged by:	D. Kardashian, AKRF	Date.	01723/2013						
Depth (feet)	Well Construction	Surface Cond	ition: Concrete and Asphalt	Recovery (Inches)	Soil Borir	ıg Log	Odor	Moisture	(mqq) OI9	NAPL	Soil Samples Collected for Laboratory Analysis
2 3 4 5		2" diameter P below grade	VC well casing: 0' to 15'	NA	Brown SAND, some Sil Gravel, trace brick (fill)	t, some	None	Dry	ND	None	
6 7 8 9 10				60	Brown SAND, some Sil Gravel, trace brick (fill)	t, some	None	Dry	ND	None	
11 12 13 14 15				60	Brown SAND, some Sil Gravel, trace brick (fill)	t, some	None	Dry	ND	None	
16 17 18 19 20		0.020-inch slo 15' to 25' belo	otted PVC well screen:	60	Top 30": Fine GRAVEL Bottom 24": Brown SAN Silt, trace Gravel	ID, some	None	Wet Wet	ND	None	
Notes: Groundwate	Groundwate er measured at 15 fe	r Depth Indicator et below grade.		No soil Ground	samples analyzed Iwater encountered at a	approximatelv 20 fe	et below o	rade duri	ng soil boi	ring install	ation.
Groundwate	er monitoring well in	istalled to 25 feet	below grade.	End of soil boring at 25 feet below grade.							
	PID = photoi	onization detecto	or NAPL = non-	aqueous	phase liquid	ppm = parts per i	million	N	D = not de	etected	
Soil classific	ations and descriptior	ns presented are b	ased on the Modified Burmis	ter Class	sification System. Descri	otions were develope	ed for envir	onmental p	ourposes of	nly.	

SOIL BOI	RING AND WELL	Queens Anima	Shelter and Care Center	Mo	Groundwater						
INSTA	LLATION LOG	AKRE Pro	viect Number: 180291		Sheet 2 of 2		:	SRI-IV	100-12	2	
		Drilling Method:	Sonic	Drilling	Sheet 2 of 2						
	<b>AK</b> RF"	Sampling Method:	Plastic sleeve	Start Ti	me: 13:05			Finish Ti	<b>me:</b> 14·45		
140 Park A	Victure South 7th Elect	Driller:	ADT								
New	York, NY 10016	weather: Logged by:	D. Kardashian, AKRF	Date:	07/29/2019						
Depth (feet)	Well Construction	Surface Condi	tion: Concrete and Asphalt	Recovery (Inches)	Soil Boring	ı Log	Odor	Moisture	(mqq) CIA	NAPL	Soil Samples Collected for Laboratory Analysis
21 22 23		2" diameter P below grade	VC well casing: 0' to 15'	60	Brown SAND, trace Gra	avel	None	Wet	ND	None	
<u>24</u>		End cap: 25' b	elow grade								
26											
27											
28											
<u>29</u>											
<u>28</u> <u>29</u>											
31											
32											
33											
<u>34</u>											
35				<u> </u>							
<u>36</u>											
37											
<u>- 39</u>											
40											
Notes: Groundwate	Groundwate er measured at 15 fe	r Depth Indicator		No soil samples analyzed Groundwater encountered at approximately 20 feet below grade during soil boring installation							
Groundwate	er monitoring well in	istalled to 25 feet	below grade.	End of	soil boring at 25 feet be	elow grade.					
	PID = photoio	nization detector	NAPL = non-a	queous	phase liquid	ppm = parts per	million		ND = not d	etected	
Soil classific	ations and descriptior	ns presented are ba	ased on the Modified Burmis	ster Class	sification System. Descrij	ptions were develo	ped for en	vironmenta	al purposes	s only.	

SOIL BOI	RING AND WELL	Queens Anima	al Shelter and Care Center		Groundwater						
INSTA	LLATION LOG	AKRE PI	roiect Number: 180291		Sheet 2 of 2		S	RI-M	W-13		
		Drilling Method:	Sonic	Drilling							
O	<b>AK</b> RF	Sampling Method:	Plastic sleeve	Start Ti	<b>me:</b> 9:40			Finish Ti	me: 10:45		
440 Park A	Avenue South, 7 <sup>th</sup> Floor	Driller: Weather:	ADT 85 °F sunny								
New	v York, NY 10016	Logged by:	D. Kardashian, AKRF	Date:	07/29/2019						
Depth (feet)	Well Construction	Surface Con	dition: Concrete and Asphalt	Recovery (Inches)	Soil Borin	ig Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1 2 3 4		2" diameter P below grade	'VC well casing: 0' to 20'	NA	Brown brown coarse S/ Gravel (fill)	AND, some Silt,	None	Dry	ND	None	
56											
					Brown SAND, some Sil	t, trace Gravel (fill)	None	Dry	118.1	None	
<u>8</u> 9				60							
10											
11					Brown coarse SAND, s	ome Silt, Gravel	None	Dry	6.8	None	
12											
13				00							
<u>14</u>											
<u>16</u>					Top 42": Brown SAND,	some Silt,	None	Wet @ 16'	ND	None	
17				60	Graver						
19											
20 Notes:	Groundwate	r Depth Indicator		No soil	samples analyzed						
Groundwat	er measured at 21 fe	et below grade.		Groundwater encountered at approximately 16 feet below grade during soil boring installation.							
Groundwat	er monitoring well in PID = photoi	nstalled to 30 feet	t below grade. or ΝΔΡΙ = non-a	End of	son boring at 30 feet b	elow grade.	nillion	N	ID = not d	etected	
Soil classific	cations and description	ns presented are b	based on the Modified Burmis	ter Class	sification System. Descri	ptions were develop	ed for envi	ronmental	purposes of	only.	

SOIL BO	RING AND WELL	Queens Anima	al Shelter and Care Center	Mo	Groundwater						
INSTA	LLATION LOG	AKRE Pr	roject Number: 180291		Sheet 2 of 2		:	SRI-N	100-13	5	
		Drilling Method:	Sonic	Drilling							
O	<b>AK</b> RF	Sampling Method:	Plastic sleeve	Start Ti	<b>me:</b> 9:40			Finish Ti	<b>me:</b> 10:45		
440 Park A	Avenue South. 7 <sup>th</sup> Floor	Driller: Weather:	ADT 85 °F sunny								
New	v York, NY 10016	Logged by:	D. Kardashian, AKRF	Date:	07/29/2019			-			
Depth (feet)	Well Construction	Surface Cond	lition: Concrete and Asphalt	Recovery (Inches)	Soil Boring	Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
21 22 23 24 25		0.020-inch slo to 30' below (	otted PVC well screen: 20' grade	60	Dark Gray SILT and SA fine Gravel	ND, trace	None	Wet	ND	None	
<u>26</u>					Gray SILT, little Sand		None	Wet	ND	None	
27 28 29		End cap: 30' below grade		60							
<u>31</u>		End cap: 30'	below grade								
32											
<u>33</u> 34											
35											
36											
37											
38											
40	<u>- 39</u> 40										
Notes:	Groundwate	r Depth Indicator		No soil	samples analyzed	annrovimetaly 20	foot hales			horing is	tallation
Groundwat	er monitoring well in	nstalled to 30 feet	below grade.	End of	soil boring at 30 feet be	elow grade.	ieer beiov	w yraue di	aning soil i		
<b>• •</b>	PID = photoio	nization detector	NAPL = non-a	queous	phase liquid	ppm = parts per	million	. 1	ND = not d	letected	
Soil classific	cations and descriptior	ns presented are b	ased on the Modified Burmis	ster Class	sification System. Descrij	ptions were develo	ped for en	vironmenta	al purposes	s only.	

SOIL BO	RING AND WELL LLATION LOG	Queens Anima 151 Woodwa	I Shelter and Care Center rd Avenue, Queens, NY	Moi	Groundwater nitoring Well ID:		SF	RI-MV	V-11		
		Drilling Method:		Drilling	Sheet 2 of 2		_	_		_	_
$\bigcirc$	<b>AK</b> RF	Sampling Method:	Plastic sleeve	Start Ti	i <b>me:</b> 12:45			Finish Ti	<b>me:</b> 13:50		
440 Park	Avenue South, 7th Floor	Driller: Weather:	ADT 85 °F. sunnv		07/00/0010						
New	v York, NY 10016	Logged by:	D. Kardashian, AKRF	Date:	07/30/2019		1			_	
Depth (feet)	Well Construction	Surface	Condition: Concrete	Recovery (Inches)	Soil Bori	ing Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1 2 3 3		2" diameter F below grade	VC well casing: 0' to 12'	NA	Top 36": Black to brow and SILT, trace plastic Bottom 24": Black to br and SILT (fill)	n coarse SAND ;, asphalt (fill) rown coarse SAND	None	Dry Dry	ND	None	
<u>4</u>											
- <u>    6                                </u>				60	Brown coarse SAND a Gravel	nd SILT, little	Weathered petroleum- like	Dry	ND	None	
<u>9</u>											
<u>11</u>			slotted PVC well screen: elow grade		Brown coarse SAND a Gravel	nd SILT, little	None	Wet	ND	None	
<u>13</u>		0.020-inch slo 12' to 22' belo		60							
<u> </u>					Top 12": Brown SILT, s Sand	some Clay,	None	Wet	ND	None	
- <u>18</u> . <u>19</u> 20				60	Bottom 24": Brown SIL Sand	T, some Clay,	None	Wet	ND	None	
Notes: Groundwat	tes: Groundwater Depth Indicator oundwater measured at 11 feet below grade.				samples analyzed Iwater encountered at	approximately 10 fee	t below grad	e during s	oil boring	installatio	on.
Groundwat	PID = phote	oionization detec	tor NAPL = no	n-aqueo	son boring at 22 feet b us phase liquid	ppm = parts per	r million	ND	= not det	ected	
Soil classific	cations and description	ns presented are b	ased on the Modified Burm	ister Clas	ssification System. Desc	riptions were develop	ed for environr	mental purp	poses only		

SOIL BORING AND	WELL	Queens Anima	Shelter and Care Center	Mo	Groundwater nitoring Well ID:							
INSTALLATION I	LOG	AKRF Pro	piect Number: 180291		Sheet 2 of 2		ì	SKI-IV	100-11	l		
		Drilling Method:	Sonic	Drilling								
<b>MAK</b> RI	⊣"	Sampling Method:	Plastic sleeve	Start Ti	me: 12:45			Finish Ti	<b>me:</b> 13:50			
140 Park Avenue South 7th	h Eleor	Driller:	ADT									
440 Park Avenue South, 7th Floor New York, NY 10016         9       Well Construction         22       22         22       23         24       24         25       26         27       28		Weather: Logged by:	D. Kardashian, AKRF	Date:	07/30/2019							
(1994) Well Const de D	truction	Surface	Condition: Concrete	Recovery (Inches)	Soil Boring	Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis	
		End cap: 22' b	pelow grade		Brown SILT, some Clay	/, coarse Sand	None	Wet	ND	None		
23		Lind Cup. 22	ción grade	36	Refusal at 22 feet on a	cobble						
24												
26												
27												
28												
<u>29</u>												
<u>31</u>												
33												
<u>34</u>												
35												
<u>36</u>												
<u>39</u>												
40												
Notes: V Grou Groundwater measured	otes: Groundwater Depth Indicator roundwater measured at 11 feet below grade					No soil samples analyzed Groundwater encountered at approximately 10 feet below grade during soil boring installation						
Groundwater monitorin	istalled to 22 feet	soil boring at 22 feet be	elow grade.	-	-	-	<b>U</b>					
PID = Soil classifications and d	escription	nization detector	NAPL = non-a	1-aqueous phase liquid ppm = parts per million ND = not detected								

SOIL BOR	RING AND WELL	Queens Anima 151 Woodwa	I Shelter and Care Center rd Avenue, Queens, NY	Mo	Groundwater nitoring Well ID:		s	RI-M	W-12		
		AKRF Pro	oject Number: 180291		Sheet 2 of 2						
$\sim$	<b>K</b> BE	Drilling Method:	Sonic	Drilling							
	<b>IN</b> IU'	Driller:	ADT	Start Ti	ime: 13:05			Finish Tiı	<b>ne:</b> 14:45		
440 Park A	venue South, 7th Floor	Weather:	85 °F, sunny	Dato <sup>.</sup>	07/20/2010						
New	York, NY 10016	Logged by:	D. Kardashian, AKRF	Date.	01723/2013						
Depth (feet)	Well Construction	Surface Cond	ition: Concrete and Asphalt	Recovery (Inches)	Soil Borir	ıg Log	Odor	Moisture	(mqq) OI9	NAPL	Soil Samples Collected for Laboratory Analysis
2 3 4 5		2" diameter P below grade	VC well casing: 0' to 15'	NA	Brown SAND, some Sil Gravel, trace brick (fill)	t, some	None	Dry	ND	None	
6 7 8 9				60	Brown SAND, some Sil Gravel, trace brick (fill)	t, some	None	Dry	ND	None	
11 12 13 14 15				60	Brown SAND, some Sil Gravel, trace brick (fill)	t, some	None	Dry	ND	None	
16 17 18 19 20		0.020-inch slo 15' to 25' belo	otted PVC well screen:	60	Top 30": Fine GRAVEL Bottom 24": Brown SAN Silt, trace Gravel	ID, some	None	Wet Wet	ND	None	
Notes: Groundwate	Groundwate er measured at 15 fe	r Depth Indicator et below grade.		No soil Ground	samples analyzed Iwater encountered at a	approximatelv 20 fe	et below o	rade duri	ng soil boi	ring install	ation.
Groundwate	er monitoring well in	istalled to 25 feet	below grade.	End of soil boring at 25 feet below grade.							
	PID = photoi	onization detecto	or NAPL = non-	aqueous	phase liquid	ppm = parts per i	million	N	D = not de	etected	
Soil classific	ations and descriptior	ns presented are b	ased on the Modified Burmis	ter Class	sification System. Descri	otions were develope	ed for envir	onmental p	ourposes of	nly.	

SOIL BOI	RING AND WELL	Queens Anima	Shelter and Care Center	Mo	Groundwater						
INSTA	LLATION LOG	AKRE Pro	viect Number: 180291		Sheet 2 of 2		:	SRI-N	100-12	2	
		Drilling Method:	Sonic	Drilling	Sheet 2 of 2						
	<b>AK</b> RF"	Sampling Method:	Plastic sleeve	Start Ti	me: 13:05			Finish Ti	<b>me:</b> 14·45		
140 Park A	Victure South 7th Elect	Driller:	ADT								
New	York, NY 10016	weather: Logged by:	D. Kardashian, AKRF	Date:	07/29/2019						
Depth (feet)	Well Construction	Surface Condi	tion: Concrete and Asphalt	Recovery (Inches)	Soil Boring	ı Log	Odor	Moisture	(mqq) CIA	NAPL	Soil Samples Collected for Laboratory Analysis
21 22 23		2" diameter P below grade	VC well casing: 0' to 15'	60	Brown SAND, trace Gra	avel	None	Wet	ND	None	
<u>24</u>		End cap: 25' b	elow grade								
26											
27											
28											
<u>29</u>											
<u>28</u> <u>29</u>											
31											
32											
33											
<u>34</u>											
35				<u> </u>							
<u>36</u>											
37											
<u>- 39</u>											
40											
Notes: Groundwate	Groundwate er measured at 15 fe	r Depth Indicator		No soil samples analyzed Groundwater encountered at approximately 20 feet below grade during soil boring installation							
Groundwate	er monitoring well in	istalled to 25 feet	below grade.	End of	soil boring at 25 feet be	elow grade.					
	PID = photoio	nization detector	NAPL = non-a	queous	phase liquid	ppm = parts per	million		ND = not d	etected	
Soil classific	ations and descriptior	ns presented are ba	ased on the Modified Burmis	ster Class	sification System. Descrij	ptions were develo	ped for en	vironmenta	al purposes	s only.	

SOIL BOI	RING AND WELL	Queens Anima	al Shelter and Care Center		Groundwater								
INSTA	LLATION LOG	AKRE PI	roiect Number: 180291		Sheet 2 of 2		S	RI-M	W-13				
		Drilling Method:	Sonic	Drilling									
O	<b>AK</b> RF	Sampling Method:	Plastic sleeve	Start Ti	<b>me:</b> 9:40			Finish Ti	me: 10:45				
440 Park A	Avenue South, 7 <sup>th</sup> Floor	Driller: Weather:	ADT 85 °F sunny										
New	v York, NY 10016	Logged by:	D. Kardashian, AKRF	Date:	Jate: U//29/2019								
Depth (feet)	Well Construction	Surface Con	dition: Concrete and Asphalt	Recovery (Inches)	Soil Borin	ig Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis		
1 2 3 4		2" diameter P below grade	'VC well casing: 0' to 20'	NA	Brown brown coarse S/ Gravel (fill)	AND, some Silt,	None	Dry	ND	None			
56													
					Brown SAND, some Sil	t, trace Gravel (fill)	None	Dry	118.1	None			
<u>8</u> 9													
10													
11					Brown coarse SAND, s	ome Silt, Gravel	None	Dry	6.8	None			
12													
13				00									
<u>14</u>													
<u>16</u>					Top 42": Brown SAND,	some Silt,	None	Wet @ 16'	ND	None			
17				60	Graver								
19													
20 Notes:	Groundwate	r Depth Indicator		No soil	samples analyzed								
Groundwat	er measured at 21 fe	et below grade.		Ground	lwater encountered at	approximately 16 fe	eet below	grade dur	ing soil be	oring insta	allation.		
Groundwat	er monitoring well in PID = photoi	nstalled to 30 feet	t below grade. or ΝΔΡΙ = non-a	End of	son boring at 30 feet b	elow grade.	nillion	N	ID = not d	etected			
Soil classific	cations and description	ns presented are b	based on the Modified Burmis	ter Class	sification System. Descri	ptions were develop	ed for envi	ronmental	purposes of	only.			

SOIL BO	RING AND WELL	Queens Anima	al Shelter and Care Center	Mo	Groundwater							
INSTA	LLATION LOG	AKRE Pr	roject Number: 180291		Sheet 2 of 2		:	SRI-IV	100-13	5		
		Drilling Method:	Sonic	Drilling								
O	<b>AK</b> RF	Sampling Method:	Plastic sleeve	Start Ti	<b>me:</b> 9:40			Finish Ti	<b>me:</b> 10:45			
440 Park A	Avenue South. 7 <sup>th</sup> Floor	Driller: Weather:	ADT 85 °F sunny									
New	v York, NY 10016	Logged by:	D. Kardashian, AKRF	Date:	07/29/2019			-				
Depth (feet)	Well Construction	Surface Cond	lition: Concrete and Asphalt	Recovery (Inches)	Soil Boring	Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis	
21 22 23 24 25		0.020-inch slo to 30' below (	otted PVC well screen: 20' grade	60	Dark Gray SILT and SA fine Gravel	ND, trace	None	Wet	ND	None		
<u>26</u>	Gray SILT, little Sand None Wet ND None											
<u>28</u> <u>29</u>												
<u>31</u>		End cap: 30'	below grade									
32												
<u>33</u> 34												
35												
36												
37												
38												
40												
Notes:	Groundwate	r Depth Indicator		No soil	samples analyzed	annrovimetaly 20	foot hales			horing is	tallation	
Groundwat	er monitoring well in	nstalled to 30 feet	below grade.	End of	soil boring at 30 feet be	elow grade.	ieer beiov	w yraue di	aning soil i			
<b>.</b>	PID = photoio	nization detector	NAPL = non-a	queous	phase liquid	ppm = parts per	million	. 1	ND = not d	letected		
Soil classific	cations and descriptior	ns presented are b	ased on the Modified Burmis	ster Class	sification System. Descrij	ptions were develo	ped for en	vironmenta	al purposes	s only.		

APPENDIX E

POST-REMEDIAL MONITORING WELL CONSTRUCTION AND DEVELOPMENT LOGS

	KKF_	02						X	Well Sampling	g Log
Job No:	180791					Client:			Well No:	
Project Loca	tion: CINPOI	ne Anima	1 Shalte	V		Sampled By: 7	SUDADAON	IC .		
Date:	(6)207	0	1 Ol wire			Sampling Time:	Silvinou		I DO DAL	1-01
LEL at surfa	ce:					Childping Thirty			- KU-MW	1-01
PID at surfac	e:								-	
Total Depth:				ft, below top of	casing	Water Column (W	C):	feet	*= 0.163 * WC for 2" we	lls
epth to Wat	er:		ama	ft, below top of	casing	Well Volume*:		gallons	*= 0.653 * WC for 4" we	ells
epth to Pro	duct:			ft. below top of	casing	Volume Purged:		gallons	*= 1.469 * WC for 6" we	ells
epth to top	of screen:			ft, below top of	casing	Well Diam.:		inches	Target maximum	,
Depth to bott	om of screen:			ft. below top of	casing	Purging Device (Du	imp type):		flow rate is	
Approx. Pum	p Intake:			ft. below top of	casing				100 ml/min	
Time	Depth to Water	Purge Rate	Тетр	Conductivity	DO	рЦ	ORP	Turbidity	Comments	
	(Ft.)	(ml/min)	(°C)	(mS/cm)	(mg/L)	pri	(mV)	(NTU)	(problems, odor, sheer	n)
						/			_ DUNORD	TOV
										25
									6 marking	24
									U WUIKIV	10f
						. 11			daine	U
			/				2			-
									- bailed c	lonic
								_	Donicor C	ICON
									D no	16
									0	N
									-	•
									_	
/						6				
					4					
	Stabilizatio	n Criteria:		+/- 3 mS/cm	+/- 0.3 mg/L	+/- 0.1 pH units	+/- 10 mV	<50 NTU	If water quality parameters do no and/or turbidity is greater than within two hours, discontinue pu collect sample.	ot stabilize 50 NTU urging and
Groundwater	samples analyzed	d for:						1	1	
	1 2									

Jab No:         B0791         Client:         NYCACC         Well No:           Project Leading:         Au 1 MAD         Skampled By:         Sampled By:         RA-MW-02           Date:         71202220         Sampling Time:         RA-MW-02           UEL at surface:	bb No:         Client:         N CACC         Well No:           Project Location:         ALXAM MAD Shepter         Sampled By:         A           Date:         JL 2000         Sampling Time:         B           ELL at surface:         Sampling Time:         B         B           UD at surface:         Sampling Time:         B         B           ELL at surface:         Sampling Time:         B         B           Violat Depth:         IS         ft. below top of casing         Water Column (WC):         5           Septh to Water:         IO.S.         ft. below top of casing         Woll Water Tipe:         gallons         *= 0.653 * WC for 2* wells           Septh to top dressing         Well Volume*rared:         gallons         *= 0.653 * WC for 5* wells         Parget maximum           Septh to top dressing         Well Volume*rared:         gallons         *= 1.408 * WC for 5* wells           Septh to top dressing         Purgling Device (purgling type):         Index in the ising type type):         Index in the ising type type type type type type type type					1				×	Well Sampling Log	
Sampled By:         Sampled By:         Bate:       Sampled By:         Bate:       Sampled By:         Bate:       Sampled By:         Bate:       Sampled By:         Date:       Sampled By:         Date:       Sampled By:         Bate:       Sampled By:         Date:       Colspan="2">Sampled By:         Date:       Colspan="2">Sampled By:         Date:       Colspan="2">Colspan="2">Adv colspan="2">Colspan="2"         Colspan= Cols	Traject Location: A VLBAS fM i M&O Shopfer         Sampling Time:         RA- MW-02           Date: 1/28/2016         Simpling Time:         RA- MW-02           Date: 1/28/2016         R. below top of casing         Water Coloma (WO): Sing to 100 mic *:         gallons         *= 0.163 * WC for 2* wells           Part for the other of the other op of casing         Water Coloma (WO): Sing to 100 mic *:         gallons         *= 1.69 * WC for 2* wells           Part for the other of casing         Woll Volume *:         gallons         *= 1.69 * WC for 2* wells           Part for the other of casing         Woll Volume *:         gallons         *= 1.69 * WC for 2* wells           Part for the other of casing         Woll Volume *:         gallons         *= 1.69 * WC for 2* wells           Part for the other of screene:         S         R. below top of casing         Purging Device (pump type):         machine           Tree         fit (minum)         (C)         R. below top of casing         IV art for a         100 ml/min           Tree         fit (minum)         (C)         (C)         (C)         Startfed         100 ml/min           12:00         0.5         I         A1         7.75 c.         Startfed           13:10         24:01         1.71 2         2.82 4         Y         Y         Y	lob No:	180291					Client:	INCAC C		Well No:	
Date:       1/12/02/02       Sampling Time:       R.A - MW-02         ELL at surface:	Date:         ITEN 2000         Sampling Time:         R.A MW-02           ELL at surface:         -         0         0.633 *WC for 2* wells         0           Date surface:         -         0         0.633 *WC for 2* wells         0           Starph to Water:         0.55         ft. below top of casing         Well Valume*:         gallons         *= 0.653 *WC for 2* wells           Starph to Water:         0.653 *WC for 2* wells         inches         *= 1.489 *WC for 2* wells         *=           Starph to Starphic Starph         Nume Purget:         gallons         *= 1.489 *WC for 2* wells         *=           Starph to Starph to Starphic Starph         Nume Purget:         gallons         *= 1.489 *WC for 2* wells         *=           Starph to Starph to Starph         Nume Purget:         gallons         *= 1.489 *WC for 2* wells         *=           Starph to Starph to Starph         Nume Purget:         gallons         *= 1.489 *WC for 4* wells         *=           Starph to Starph         Nume Purget:         gallons         *= 1.489 *WC for 4* wells         *           Starph to Starph         Nume Purget:         Nume Purget:         math to not starph         *         Nume Purget:         *         Nume Purget:         Nume Purget:         Nume Purget:         Nume Purget:	Project Locatio	on: Queens	Animal	Sheeter			Sampled By: -				1
<b>ELE as urface:</b>	ELE as urface:	Date: 7/2	18/200					Sampling Time:			1. 1	8 
ID at surface:	1D at sufface:	EL at surface	:				1				RA-MW-02	
Unter         S         ft. below top of casing         Water Column (WC):         S         feet         = 0.163 * WC for 2" wells           Depth to Nater:         [0]. S         ft. below top of casing         Well Volume Purged:         gallons         *= 0.653 * WC for 2" wells           Depth to Top of serveen:         S         ft. below top of casing         Well Volume Purged:         gallons         *= 0.463 * WC for 2" wells           Depth to Top of serveen:         S         ft. below top of casing         Well Volume Purged:         inches         Target maximum           Perpth to Top of serveen:         S         ft. below top of casing         Well Volume Purged:         inches         Target maximum           Perpth to Top of serveen:         It. below top of casing         Well Diam:         inches         Target maximum           Perpt Work Purget Bate         Temp         Conductivity         DO         PH         ORP         Turbidity         Comments           [12:00         O.S         [00         Z3.67         I.772         Z.827         G. 571         Q1         Z.972         G. 571         Q1         Z.972         G. 577         R57         Z3.9         Y.972         Y.972         G. 577         S7.1         Q0         G. 577         G. 577         G. 577	Unter         S         ft. below top of casing         Water Column (WC): S         feet         *= 0.63 * WC for 2* wells           bepth to Mater:         (0, S)         ft. below top of casing         Well Volume?:         galloos         *= 0.63 * WC for 4* wells           bepth to Podatt:         (1/k)         ft. below top of casing         Well Volume?:         galloos         *= 0.63 * WC for 4* wells           bepth to food screee:         S         ft. below top of casing         Well Volume?:         galloos         *= 1.469 * WC for 6* wells           prepth to food screee:         S         ft. below top of casing         Purgtu Diver (pump type):         inches         Target maximum           prepth to motion of screee:         JO         ft. below top of casing         Purgtu Diver (pump type):         inches         Target maximum           prepth to motion of screee:         JO         ft. below top of casing         Well Dism:         inches         Target maximum           informatic:         JO         ft. below top of casing         Purgtu Diver (pump type):         ft. below top of casing         Well Dism:         inches         Target maximum         ft. wells           ipprox.         mp Intrinkit:         Torp         Conserve         ft. wells         ft. wells         ft. wells         ft. wells	ID at surface:										
Verter         Op. 5         ft. below top of casing.         Well Volume*:         gallons         *= 0.653 * WC for 4" wells           Perpt to Volume:         Notwer Purget:         gallons         *= 1.459 * WC for 6" wells         *= 0.653 * WC for 4" wells           Perpt to Volume:         Notwer Purget:         gallons         *= 1.459 * WC for 6" wells         *= 0.653 * WC for 4" wells           Perpt to Volume Forces:         S         ft. below top of casing.         Well View Purget Ait         inches         inches         Target maximum           pprox. Pump Istake:         IO         ft. below top of casing.         Well View (pump type):         100 ml/min         100 ml/min           Time         Purpt to Water :         IO         ft. below top of casing.         Water ca         100 ml/min         100 ml/min           12:20         IO.5         IOO         X8.62         I · 72         2.82         G.57         S7         7.78-1           13:10         II.72         Z.82         G.51         40         G.53         40         41.70         9           13:10         II.72         Z.82         G.57         A1         40         G.57         9         9         WIG 9.3         9         WIG 9.3           13:15         II.71	Verter         (D, S)         ft. below top of casing         Well Volume*:         gallons         *= 0.653 * WC for 4* wells           Perpth to Pordact:         J/A         .t. below top of casing         Volume *:         gallons         *= 0.653 * WC for 6* wells           Perpth to Pordact:         J/A         .t. below top of casing         Volume *:         gallons         *= 1.468 * WC for 6* wells           Perpth to bottom of screen:         S         ft. below top of casing         Purging Device (poum type):         inches         Target maximum           Interview         JO         ft. below top of casing         Walter ca-         100 ml/min           Time         Depth to Water         Purg Rate         Target maximum         ft. below top of casing         Walter ca-           Time         Opeth to Water         Purg Rate         Target maximum         ft. below top of casing         Walter ca-         100 ml/min           12:20         (0.5         JOO         2.8, 67         1.72         2.72         6.57         S.7         7.8:1           13:10         2.4:01         1.72         2.72         6.57         S.7         S.7         Ft.44         Purg Parget           13:24         2.4:10         1.72         3.732         6.57         S.7	otal Depth:	15			ft. below top of	casing	Water Column (W	C): 5	feet	*= 0.163 * WC for 2" wells	
epth to Product:         M/A         R. below top of casing         Volume Purget:         gallons         *= 1.469 * WC for 6" wells           epth to bottom of screen:         S         R. below top of casing         Purging Device (pump type):         inches         Target maximum         ft           pprox. Pump Intake:         JO         R. below top of casing         Purging Device (pump type):         Torbidity         Target maximum         ft         ft           Time         Depth to Mater         Purg Rate         Temp         Conductivity         DO         pH         ORP         Turbidity         Comments           12:30         (0.5         (00         28.67         1.77         2.82         6.57         77         78:1           12:05         (0.5         28.67         1.77         2.87         6.57         87         77.5.1         Stavfed           13:10         28.40         1.77         2.87         6.57         87         75.1         Stavfed         WC methode           13:10         29.10         1.77         2.87         6.57         87         34.0         WC methode         WC methode <t< td=""><td>epth to Product:       M/A       it. below top of casing       Volume Purged:       pallons       '= 1.469 * WC for 6" wells         epth to bottom of screen:       5       it. below top of casing       Well Dam:       inches       Target maximum       Torget maximum         pprox. Pump Intake:       10       0       below top of casing       Well Dam:       inches       Target maximum       Torget maximum         Time       Depth to Water       Purge Rate       Temp       Conductivity       DO       pH       ORP       Turbidity       Comments         (Ft)       (mlumin)       (CC)       (mscim)       (mscim)       (mscim)       (multip in in</td><td>epth to Water</td><td>r: 10.5</td><td></td><td></td><td>ft. below top of</td><td>casing</td><td>Well Volume*:</td><td></td><td>gallons</td><td>*= 0.653 * WC for 4" wells</td><td></td></t<>	epth to Product:       M/A       it. below top of casing       Volume Purged:       pallons       '= 1.469 * WC for 6" wells         epth to bottom of screen:       5       it. below top of casing       Well Dam:       inches       Target maximum       Torget maximum         pprox. Pump Intake:       10       0       below top of casing       Well Dam:       inches       Target maximum       Torget maximum         Time       Depth to Water       Purge Rate       Temp       Conductivity       DO       pH       ORP       Turbidity       Comments         (Ft)       (mlumin)       (CC)       (mscim)       (mscim)       (mscim)       (multip in	epth to Water	r: 10.5			ft. below top of	casing	Well Volume*:		gallons	*= 0.653 * WC for 4" wells	
Jepth to top of screen:         J         ft. below top of casing         Well Diam:         inches         Target maximum flow rate is           pprox. Pum Itata::         JO         ft. below top of casing         Purging Device (pump type):         100 m//min           Time         Depth to Water         Purge Rate         Temp         Conductivity         DO         pH         ORP         Turkidity         Comments           (Pt.)         (mUrmin)         (CC)         (mScm)         (mgL)         pH         (mV)         (NTU)         Comments           13:00         1         28.82         1.712         2.82         0.511         A1         7.5-6         Stav1fed,         pW// Stave, addr. sheen)         Stave, addr. sheen)         Stave, addr. sheen         Stave, addr. sheen         Stave, addr. sheen         Stave, addr. sheen         Stave,	S         ft. below top of casing         Well Diam:         inches         Target maximum flow rate is           pprox. Pump Intake:         JS         ft. below top of casing         Purging Device (pump type):         100 ml/min           Time         Depth to Water         Purge Rate         Temp         Connectivity         DO         pH         ORP         Turbidity         100 ml/min           Time         (FL)         (ml/min)         (CC)         (msCm)         (mgL)         pH         ORP         Turbidity         (poblems, odor, sheen)         100 ml/min           13:00         1         77.2         28.2         05         17         7.8.1         100         17         18         100         65         17         7.8.1         100         17 <td< td=""><td>epth to Produ</td><td>ict: NIA</td><td></td><td></td><td>ft. below top of</td><td>casing</td><td>Volume Purged:</td><td></td><td>gallons</td><td>*= 1.469 * WC for 6" wells</td><td></td></td<>	epth to Produ	ict: NIA			ft. below top of	casing	Volume Purged:		gallons	*= 1.469 * WC for 6" wells	
Perpt to bottom of servea:       IS       ft. below top of casing       Purging Device (pump type):       Interview       Interview <t< td=""><td>Perpt to bottom of screee:         IS         ft. below top of casing         Purging Device (pump type):         IDS of the is           Time         Doph to Water         Purge Rate         Tenpa Conductivity         DO         pH         OC         Turbidity         Comments           12:00         (FL)         (mU/min)         (CC)         (mS/m)         (mg/L)         pH         OC         Comments         (mov)         (mU/min)         Comments           13:00         17:72         2:82         0.571         \$77         78:1         (mov)         (mU/min)         Stat/ed         PU/C         Stat/ed         PU/C         Comments         (mov)         (mU/min)         Comments         (mov)         Comments         (mov)</td><td>epth to top of</td><td>screen:</td><td>5</td><td></td><td>ft. below top of</td><td>casing</td><td>Well Diam.:</td><td>2</td><td>inches</td><td>Target maximum</td><td></td></t<>	Perpt to bottom of screee:         IS         ft. below top of casing         Purging Device (pump type):         IDS of the is           Time         Doph to Water         Purge Rate         Tenpa Conductivity         DO         pH         OC         Turbidity         Comments           12:00         (FL)         (mU/min)         (CC)         (mS/m)         (mg/L)         pH         OC         Comments         (mov)         (mU/min)         Comments           13:00         17:72         2:82         0.571         \$77         78:1         (mov)         (mU/min)         Stat/ed         PU/C         Stat/ed         PU/C         Comments         (mov)         (mU/min)         Comments         (mov)	epth to top of	screen:	5		ft. below top of	casing	Well Diam.:	2	inches	Target maximum	
ppprox. Pump Intake:         jo         n. below top of casing         Water rat         100 ml/min           Time         Perge Rate         Temp         Conductivity         DO         pH         ORP         Turbidity         Comments           (FL)         (ml/min)         (CC)         (ms/min)         (CC)         (ms/min)         (CO)         Stabilization Criteria:         1.7.2         2.8.2         G. ST         ST         TS.1         GO         GS         GR         Stabilization Criteria:         1.7.7.2         2.7.7.2         G. ST         ST         Stabilization Criteria:         1.7.7.2         2.7.7.2         G. ST         GO         H         GR         Stabilization Criteria:         Stabilization Criteria:         1.7.7.2         2.7.7.2         G. ST         GO         H         Stabilization Criteria:         1.7.7.2         2.7.7.2         G. ST         GO         H         GR         GR </td <td>ppprox. Pump Intake:         jo         n. below top of casing         Water row         100 ml/min           Time         Depth to Water         Purg Rate         Temp         Conductivity         DO         pH         ORP         Turbidity         Comments         (nulmin)           12:00         10.5         100         28.67         1.712         2.822         C.571         877         78.1         (nulmin)         (nulmi</td> <td>epth to botton</td> <td>n of screen:</td> <td>15</td> <td></td> <td>ft. below top of</td> <td>casing</td> <td>Purging Device (p</td> <td>ımp type):</td> <td>1</td> <td>flow rate is</td> <td></td>	ppprox. Pump Intake:         jo         n. below top of casing         Water row         100 ml/min           Time         Depth to Water         Purg Rate         Temp         Conductivity         DO         pH         ORP         Turbidity         Comments         (nulmin)           12:00         10.5         100         28.67         1.712         2.822         C.571         877         78.1         (nulmin)         (nulmi	epth to botton	n of screen:	15		ft. below top of	casing	Purging Device (p	ımp type):	1	flow rate is	
Time         Depth to Water         Parge Bate         Temp         Conductivity         DO         pH         ORP         Turbidity         Comments           (PL)         (ml/min)         (C)         (mScm)         (mgL)         (mV)         (NTU)         (problems, odor, sheen)         (problems, odor, sheen)           13:10         //2.8.82         1.774         7.82         0.571         877         7.81           13:10         //2.8.82         1.774         7.80         0.51         91         7.75.6           13:10         //2.8.82         1.774         7.80         0.51         91         7.75.1           15:15         //2.9.10         1.13         2.772         6.51         90         41.9         90         90         90         90         91         90         91         90         91.9         90         91.9         90         91.9         90         91.9 <td>Time         Perge Rate         Temp         Conductivity         DO         pH         ORP         Turbidity         Conments           15:10         (ml/min)         (C)         (ms/m)         (mgL)         (mgL)         (mV)         (NTU)         (problems, odar, sheen)           13:00         -         -         28:67         1.72         2.82         0.571         87         78.1           13:00         -         -         28:67         1.72         2.82         0.571         87         78.1           13:00         -         29:01         1.72         2.72         6.51         91         7.0         90</td> <td>pprox. Pump</td> <td>Intake:</td> <td>10</td> <td></td> <td>ft. below top of</td> <td>casing</td> <td>Wat</td> <td>erra</td> <td></td> <td>100 ml/min</td> <td></td>	Time         Perge Rate         Temp         Conductivity         DO         pH         ORP         Turbidity         Conments           15:10         (ml/min)         (C)         (ms/m)         (mgL)         (mgL)         (mV)         (NTU)         (problems, odar, sheen)           13:00         -         -         28:67         1.72         2.82         0.571         87         78.1           13:00         -         -         28:67         1.72         2.82         0.571         87         78.1           13:00         -         29:01         1.72         2.72         6.51         91         7.0         90	pprox. Pump	Intake:	10		ft. below top of	casing	Wat	erra		100 ml/min	
(FL)       (m/min)       (C)       (mg/L)       (my)       (mV)	(FL)       (mulmin)       (°C)       (mg/L)       (mg/L)       (mV)       (NTU)       (problems, dor, sheen)         12:00       100       28:07       1:72       2:82       (.57)       877       78:1         13:00       1       28:82       1.714       2:80       0.51       91       77:6         13:10       28:01       1.772       2:72       0.51       90       63:9         15:15       24:01       1.772       2:72       0.51       90       47.0         15:18       24:10       1.712       3:52       6:57       90       47.0         13:20       24:10       1.712       3:52       6:57       90       47.0         13:21       24:10       1.712       3:52       6:57       877       35.1         13:224       24:11       1.71       2:80       6:57       87       34.2         13:20       24:11       1.71       2:80       6:57       87       34.2         13:20       24:11       1.606       2:8       6:57       87       34.2         13:20       24:11       1.606       5:51       87       34.2       55.100         13:20	Time	Depth to Water	Purge Rate	Тетр	Conductivity	DO	рH	ORP	Turbidity	Comments	
$\frac{ 5.00}{13.05} = \frac{ 00 }{28.07} = \frac{ 5.07 }{1.72} = \frac{2.86}{2.82} = \frac{(5.57)}{9.7} = \frac{87}{78.1}$ $\frac{ 3.10 }{1.5} = \frac{ 24.0 }{24.01} = \frac{1.72}{1.72} = \frac{2.72}{6.51} = \frac{6}{90} = \frac{53.9}{47.0}$ $\frac{ 5.15 }{ 3.15 } = \frac{24.10}{24.01} = \frac{(1.72)}{1.71} = \frac{2.87}{2.87} = \frac{6.57}{60} = \frac{41.9}{47.0}$ $\frac{ 5.18 }{ 3.24 } = \frac{24.01}{24.01} = \frac{1.71}{2.82} = \frac{2.57}{6.53} = \frac{60}{40} = \frac{41.9}{47.0}$ $\frac{ 5.20 }{ 3.224 } = \frac{24.01}{2.4.11} = \frac{1.71}{2.82} = \frac{2.57}{6.53} = \frac{60}{40} = \frac{41.9}{47.0}$ $\frac{ 5.20 }{ 3.224 } = \frac{24.01}{2.4.11} = \frac{1.71}{2.82} = \frac{2.57}{6.53} = \frac{60}{41.9} = \frac{41.9}{6.53}$ $\frac{ 5.21 }{ 3.224 } = \frac{24.01}{2.4.11} = \frac{1.71}{2.82} = \frac{2.57}{6.57} = \frac{87}{57} = \frac{35.1}{35.1}$ $\frac{ 5.20 }{ 3.224 } = \frac{24.01}{2.4.11} = \frac{1.71}{2.80} = \frac{2.57}{6.57} = \frac{87}{57} = \frac{35.1}{34.2}$ $\frac{ 5.20 }{ 5.20 } = \frac{24.01}{2.21} = \frac{1.71}{2.80} = \frac{2.57}{6.57} = \frac{87}{57} = \frac{34.0}{34.2}$ $\frac{ 5.20 }{ 5.20 } = \frac{2.61}{2.21} = \frac{1.71}{2.80} = \frac{2.65}{6.57} = \frac{87}{57} = \frac{35.1}{34.2}$ $\frac{ 5.20 }{ 5.20 } = \frac{2.61}{2.21} = \frac{1.71}{2.80} = \frac{2.65}{6.57} = \frac{87}{57} = \frac{35.1}{34.2}$ $\frac{ 5.20 }{ 5.20 } = \frac{2.61}{2.21} = \frac{1.71}{1.106} = \frac{2.81}{6.57} = \frac{87}{57} = \frac{34.0}{54.2}$ $\frac{ 5.50 }{ 5.57 } = \frac{1.71}{2.7} = \frac{1.71}{2.80} = \frac{1.61}{6.57} = \frac{1.71}{8.7} = \frac{1.71}{34.2}$ $\frac{ 5.30 }{ 5.50 } = \frac{1.71}{2.81} = \frac{1.71}{2.80} = \frac{1.61}{6.57} = \frac{1.71}{8.7} = \frac{1.71}{34.2}$ $\frac{ 5.30 }{ 5.30 } = \frac{1.61}{2.81} = \frac{1.71}{2.81} = \frac{1.71}{2.80} = \frac{1.61}{6.57} = \frac{1.71}{8.7} = \frac{1.61}{2.81} = 1.6$	15.00       10.5       100       1.72       2.84       4.57       87       78.1         17.05       28.82       1.714       2.80       6.51       91       75.6         13:10       29.01       1.72       2.72       6.51       91       75.6         13:10       29.10       1.3       2.77       6.51       90       47.0         15:15       2.91.0       1.3       2.77       6.57       90       47.0         15:18       24.97       1.71       2.82       6.57       90       41.9         15:21       24.07       1.71       2.82       6.57       90       41.9         13:24       24.11       1.71       2.42       6.58       87       35.1         13:20       24.11       1.71       2.80       6.57       87       34.2         13:20       29.12       1.60       2.81       5.57       87       34.2         13:20       29.21       1.60       2.81       5.57       87       34.2         13:20       29.21       1.60       2.81       5.57       87       36.2         13:20       29.21       1.60       2.81       5.57 <td>17120</td> <td>(Ft.)</td> <td>(ml/min)</td> <td>(°C)</td> <td>(mS/cm)</td> <td>(mg/L)</td> <td>pir</td> <td>(mV)</td> <td>(NTU)</td> <td>(problems, odor, sheen)</td> <td></td>	17120	(Ft.)	(ml/min)	(°C)	(mS/cm)	(mg/L)	pir	(mV)	(NTU)	(problems, odor, sheen)	
17:05       28.82       1.74       7.80       6.51       91       7.7.6         13:10       29.01       1.72       2.72       6.51       90       63.9         13:15       29.10       1.73       2.77       6.53       90       47.0         13:18       29.07       1.71       7.82       6.53       90       47.0         13:18       29.07       1.71       7.82       6.53       90       47.9         13:18       29.07       1.71       7.82       6.53       90       47.9         13:21       29.11       1.71       2.82       6.53       90       41.9         13:21       29.12       1.71       2.82       6.53       87       35.1         13:21       29.12       1.71       2.80       6.57       87       34.2         13:20       29.12       1.62       7.81       8.7       34.2       164         13:30       29.12       1.62       7.81       8.7       34.2       164         13:30       29.12       1.62       5.57       8.57       87       35.1       75         13:30       29.12       1.62       7.81       8.7 <td>13:05       28.82       1.74       7.80       6.51       91       7.76         13:10       29.01       1.72       2.72       6.51       90       63.9         15:15       2.9.10       1.73       2.77       6.53       90       47.0         13:10       29.10       1.73       2.77       6.53       90       47.0         13:10       29.10       1.71       2.87       6.53       90       47.0         13:10       29.10       1.71       2.87       6.53       90       47.0         13:10       29.11       1.71       2.87       6.53       90       47.0         13:12       29.11       1.71       2.87       6.53       90       40.3         13:20       29.12       1.71       2.87       8.51       87       35.1         13:20       29.12       1.66       2.81       5.57       87       34.2         13:20       29.12       1.66       2.81       5.57       87       34.2         13:20       29.21       1.66       2.81       5.57       87       35.51         13:20       29.21       1.66       2.81       5.57       87&lt;</td> <td>15:00</td> <td>10.5</td> <td>100</td> <td>18:67</td> <td>1.72</td> <td>2.82</td> <td>6.57</td> <td>87</td> <td>78-1</td> <td></td> <td></td>	13:05       28.82       1.74       7.80       6.51       91       7.76         13:10       29.01       1.72       2.72       6.51       90       63.9         15:15       2.9.10       1.73       2.77       6.53       90       47.0         13:10       29.10       1.73       2.77       6.53       90       47.0         13:10       29.10       1.71       2.87       6.53       90       47.0         13:10       29.10       1.71       2.87       6.53       90       47.0         13:10       29.11       1.71       2.87       6.53       90       47.0         13:12       29.11       1.71       2.87       6.53       90       40.3         13:20       29.12       1.71       2.87       8.51       87       35.1         13:20       29.12       1.66       2.81       5.57       87       34.2         13:20       29.12       1.66       2.81       5.57       87       34.2         13:20       29.21       1.66       2.81       5.57       87       35.51         13:20       29.21       1.66       2.81       5.57       87<	15:00	10.5	100	18:67	1.72	2.82	6.57	87	78-1		
13:10       29.01       1.72       2.72       6.51       90       63.9         13:15       29.10       1.73       2.77       6.53       90       47.0         13:15       29.10       1.73       2.77       6.53       90       47.0         13:15       29.10       1.71       2.87       60       47.0         13:18       29.47       1.71       2.87       60       47.0         13:12       29.10       1.71       2.87       60       47.0         13:12       29.17       1.71       2.87       60       47.0         13:21       29.11       1.71       2.82       6.57       87       357.1         13:21       29.12       1.71       2.80       6.57       87       34.2         13:30       7       29.21       1.66       2.81       6.57       87       34.2         13:30       7       29.21       1.66       2.81       6.57       87       34.2         13:30       7       29.21       1.66       2.81       6.57       87       87       35.2         13:30       7       29.21       1.66       5.57       87	13:10       1.72       2.72       6.51       90       63.9         15:15       2.9.10       1.13       2.71       6.53       90       47.0         13:18       2.9.10       1.71       2.82       6.57       90       41.9         13:12       2.9.10       1.71       2.82       6.57       90       41.9         13:12       2.9.11       1.71       2.82       6.57       90       41.9         13:21       2.9.11       1.71       2.62       8.58       27       35.1         13:21       2.9.12       1.71       2.80       6.57       87       35.1         13:20       2.9.12       1.71       2.80       6.57       87       34.2         13:20       2.9.12       1.60       7.81       8.7       34.2       164al         pwmp       fime approx       7.5       8.51       87       35.5       1.55       1.55         13:20       2.9.12       1.60       7.81       6.51       87       36.2       55       1.55       1.55       1.55       1.55       1.55       1.55       1.55       1.55       1.55       1.55       1.55       1.55       1.55	13:05	2	1	28.82	1.74	2.80	6.51	91	15-6	Starlal	
13:15       29.10       1.73       2.77       6.53       40       47.0         13:18       29.47       1.71       2.82       6.57       60       41.9         13:12       29.10       1.71       2.82       6.57       60       41.9         13:21       29.10       1.71       2.82       6.57       60       41.9         13:21       29.10       1.71       2.82       6.57       87       35.1         13:24       29.12       1.71       2.80       6.57       87       35.1         13:20       29.12       1.71       2.80       6.57       87       34.2         13:30       29.12       1.106       2.81       6.57       87       34.2         13:30       29.21       1.106       2.81       6.57       87       34.2         13:30       29.21       1.106       2.81       6.57       87       34.2         13:30       29.21       1.106       2.81       6.57       87       35.1         14:3:50       4.95       5.57       87       35.57       75       75       75         14:3:50       4.95       5.57       5.57       87 </td <td>13:15       29.10       1.73       2.77       6.53       40       47.0         13:18       29.07       1.71       2.82       6.55       60       41.9         13:12       29.10       1.71       2.82       6.55       60       41.9         13:12       29.10       1.71       2.82       6.55       60       41.9         13:21       29.10       1.71       2.82       6.55       90       41.9         13:21       29.10       1.71       2.82       6.57       87       355.1         13:20       29.12       1.71       2.80       6.57       87       34.0         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.25       5.51       87       36.7       75       1.55         14:00       29.25       5.51       87       36.7       1.55<td>13:10</td><td></td><td></td><td>29.01</td><td>1.72</td><td>2.72</td><td>6.51</td><td>010</td><td>63.9</td><td>Simited</td><td></td></td>	13:15       29.10       1.73       2.77       6.53       40       47.0         13:18       29.07       1.71       2.82       6.55       60       41.9         13:12       29.10       1.71       2.82       6.55       60       41.9         13:12       29.10       1.71       2.82       6.55       60       41.9         13:21       29.10       1.71       2.82       6.55       90       41.9         13:21       29.10       1.71       2.82       6.57       87       355.1         13:20       29.12       1.71       2.80       6.57       87       34.0         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.21       1.66       2.81       5.51       87       34.2         13:30       29.25       5.51       87       36.7       75       1.55         14:00       29.25       5.51       87       36.7       1.55 <td>13:10</td> <td></td> <td></td> <td>29.01</td> <td>1.72</td> <td>2.72</td> <td>6.51</td> <td>010</td> <td>63.9</td> <td>Simited</td> <td></td>	13:10			29.01	1.72	2.72	6.51	010	63.9	Simited	
13:18       24.47       1.71       2.82       6.53       40       41.9         13:11       24.47       1.71       2.82       6.53       99       40.3         13:24       24.11       1.71       2.42       6.58       97       35.1         13:24       24.11       1.71       2.42       6.58       97       35.1         13:20       24.12       1.71       2.80       6.57       87       34.2         13:30       24.21       1.66       2.81       6.57       87       34.2         13:30       24.21       1.66       2.81       6.57       87       34.2         13:30       24.21       1.66       2.81       6.57       87       34.2         13:30       24.21       1.66       2.81       6.57       87       34.2         13:30       24.21       1.66       2.81       6.57       87       34.2         13:30       24.21       1.66       2.81       6.57       87       34.2         14:40       24.21       1.60       2.81       6.57       87       34.2         15:50       55       55       55       55       55	13:18       29.07       1.71       2.82       6.53       90       41.91         13:21       29.12       1.72       3.732       6.551       99       40.3         13:24       29.12       1.71       2.42       6.58       97       551         13:21       29.12       1.71       2.42       6.58       97       551         13:27       29.12       1.71       2.80       6.57       87       34.2         13:30       29.12       1.166       2.81       6.57       87       34.2         13:30       29.12       1.66       2.81       6.57       87       34.2         13:30       29.12       1.66       2.81       6.57       87       34.2         1404al       90       90       90       90       90       90         1404a       90       90       90       90       90       90         1404a       90       90       90       90       90       90         15:30       90       90       90       90       90       90       90         15:57       90       90       90       90       90       90       9	13:15			29.10	1.73	2.77	6.53	90	47.0	purging	
'12;1       24.10       1.72       3,32       6.54       ga       40.3         13:24       24.11       1.71       2.42       6.58       27       35.1         13:24       24.11       1.71       2.42       6.58       27       35.1         13:24       24.11       1.71       2.42       6.58       27       35.1         13:20       24.21       1.106       2.80       6.57       27       34.0         13:30       24.21       1.106       2.81       6.57       27       34.2         13:30       24.21       1.106       2.81       6.57       27       34.2         13:30       24.21       1.106       2.81       6.57       27       34.2         13:30       24.21       1.106       2.81       6.57       87       34.2         1404       24.21       1.106       2.81       6.57       87       34.2         13:30       24.21       1.106       2.81       6.57       87       36.2         13:30       25.05       25.05       25.05       25.05       55.05         14:40       25.05       25.05       25.05       25.05       25.05	'13:21       24.10       1.72       3.32       6.554       59       40.3         13:24       24.11       1.71       2.42       6.58       \$7       35.1         13:24       24.11       1.71       2.42       6.58       \$7       35.1         13:27       24.11       1.71       2.80       6.57       \$7       34.0         13:30       7.32.1       1.66       2.81       6.57       \$7       34.2         13:30       7.32.1       1.66       2.81       6.57       \$7       34.2         13:30       7.32.1       1.66       2.81       6.57       \$7       \$7       \$4.2         13:30       7.32.1       1.66       2.81       6.57       \$7       \$7       \$5       \$5         13:30       7.32.1       1.66       2.81       6.57       \$7       \$7       \$7       \$4.2         14:00       7.95       5.57       5.57       \$7       \$7       \$7       \$5       \$5         15:30       7.35       5.57       5.57       \$7       \$7       \$5       \$5         15:57       7.5       5.57       5.57       \$5       \$5       \$5	13:18			29.97	1.71	2.82	6.53	90	41.9	a hisal	
13:24       2.0.11       1.71       2.02       0.58       37       35.1         13:27       2.0.12       1.71       2.00       6.57       87       35.1       10.0         13:30       2.0.12       1.71       2.00       6.57       87       34.0       10.0       10.0         13:30       2.0.12       1.106       2.0       6.57       87       34.0       10.0	13:24       24.11       1.71       2.42       0.58       27       351         13:20       29.12       1.71       2.80       6.57       87       34.0         13:30       29.12       1.106       2.81       6.57       87       34.2         13:30       29.12       1.106       2.81       6.57       87       34.2         13:30       29.12       1.106       2.81       6.57       87       34.2         13:30       29.12       1.106       2.81       6.57       87       34.2         13:30       29.12       1.106       2.81       6.57       87       34.2         13:40       29.12       1.106       2.81       6.57       87       34.2         1404       11.006       2.81       6.57       87       34.2       10000000         15:50       29.12       1.106       2.81       6.57       87       34.2       100000000         15:50       29.12       1.1000       2.81       1.57       87       34.2       1000000000000000000000000000000000000	13:21	1		24.10	1.72	3.32	6.54	Ja	40.3	5 9 30	1.1
13:27       79.12       1.71       2.80       6.57       87       34.0         13:30       79.12       1.71       2.80       6.57       87       34.2         13:30       79.21       1.66       2.81       6.57       87       34.2         13:30       79.21       1.66       2.81       6.57       87       34.2         13:30       79.21       1.66       2.81       6.57       87       34.2         13:30       79.21       1.66       2.81       6.57       87       34.2         13:30       79.21       1.66       2.81       6.57       87       34.2         13:30       79.21       1.66       2.81       6.57       87       34.2         14:00       15:00       79.20       1.57       87       34.2       1.64       1.64         15:30       10:00       10:00       10:00       10:00       1.65       1.65       1.65         15:30       10:00       10:00       10:00       10:00       1.65       1.65       1.65         10:00       10:00       10:00       10:00       1.65       1.65       1.65       1.65         10:00	13:27       13:17       1.71       2.80       6.57       87       34.0         13:30       129.12       1.106       2.81       5.57       87       34.2       160tal         14.10       14.10       1.106       1.106       1.106       1.106       1.106       1.106         15.10       11.10       1.106       1.106       1.106       1.106       1.106       1.106         15.10       11.106       11.106       1.106       1.106       1.106       1.106       1.106       1.106       1.106	13:24			29.11	1.71	2.07-	0.58	37	351	1 1	
13:30       14:10 <td< td=""><td>13:30       14:21       1.106       2.81       5.51       87       34.2         13:30       14:21       1.106       2.81       5.51       87       34.2       0         13:30       14:21       1.106       2.81       5.51       87       34.2       0</td><td>12:27</td><td></td><td></td><td>79.17</td><td>1.71</td><td>2.80</td><td>6.57</td><td>27</td><td>240</td><td>I Jahal I</td><td></td></td<>	13:30       14:21       1.106       2.81       5.51       87       34.2         13:30       14:21       1.106       2.81       5.51       87       34.2       0         13:30       14:21       1.106       2.81       5.51       87       34.2       0	12:27			79.17	1.71	2.80	6.57	27	240	I Jahal I	
Stabilization Criteria:       t/- 3 mS/cm       t/- 0.3 mg/L       t/- 0.3 mg/L       t/- 10 mV       <50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.3 mg/L       +/- 10 mV       <50 NTU	12:20	A I	1	7971	1.100	2,21	1 -1	07	21. 7	tora	
Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.3 mg/L       +/- 10 mV       <50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 10 mV       <50 NTU	12.50		V	D	1.40		best	81	34,2	OWW.0	
Stabilization Criteria:     +/- 3 mS/cm     +/- 0.3 mg/L     +/- 0.1 mg/L     +/- 10 mV     <50 NTU     If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, disconting and/or turbidity is greater than 50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 10 mV       <50 NTU			Y							- Court	
Stabilization Criteria:     +/- 3 mS/cm	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 10 mV       <50 NTU										time approx	
Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.1 pH units       +/- 10 mV       <50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 10 mV       <50 NTU						144 A					
Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.1 pH units       +/- 10 mV       <50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.1 pH units       +/- 10 mV       <50 NTU							10-10			~ SWS	
Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.1 pH units       +/- 10 mV       <50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.1 pH units       +/- 10 mV       <50 NTU							K	-			
Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 0.1 pH units       +/- 10 mV       <50 NTU	Stabilization Criteria:       +/- 3 mS/cm       +/- 0.3 mg/L       +/- 10 mV       <50 NTU						ŧ		'			
	roundwater samples analyzed for:		Stabilization	ı Criteria:		+/- 3 mS/cm	+/- 0.3 mg/L	+/- 0:1-pH_units	+/- 10 mV	<50 NTU	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample,	

ob No:				D		Client:	NYCACC		Well No:	
Project Loca	tion: Quens	Animal	Shellter			Sampled By:	is junct			
Date:	1/28	, invinced	- usur			Sampling Time:			PO-DALU-02	
LEL at surfa	ce:								LU MIN 02	
PID at surfa	e:	<u>,</u>								
Total Depth:	14.5'			ft. below top of	casing	Water Column (W	C): 4	feet	*= 0.163 * WC for 2" wells	
Depth to Wa	ter: (0.5)			ft. below top of	casing	Well Volume*:		gallons	*= 0.653 * WC for 4" wells	
Depth to Pro	duct: N/A	1		ft. below top of	casing	Volume Purged:		gallons	*= 1.469 * WC for 6" wells	
Depth to top	of screen:	0	0	ft. below top of	casing	Well Diam.:	2	inches	Target maximum	
Depth to bott	om of screen:	UHS .	S	ft. below top of	casing	Purging Device (pu	ump type):		flow rate is	
Approx. Pun	ip Intake:	12		ft. below top of	casing	Wat	erra			
Time	Depth to Water	Purge Rate	Temp	Conductivity	DO	рН	ORP		(problems odor sheen)	
SIT					(mg/L)	6,41	233		(provide), out, bittery	
010	10.5	100	2410	271.	C R L	6 00	231	100	f  -	
1.25	1	X	701	321	5.00	140	723	181	1000010	
8.72		31	777 56	2 IE	CALL	6.13 C 47	210	106	Deopur.	
8.95		<u> </u>	74.40	5.05	5.04	0-1- 1 111	200	170	putropivic	
0.55		<b>F</b>	24/18	4.01	4 91	6.00	2 001	202.0	, @ sam	
9.00			21.60	3.90	527	6.45	200	21.0	1	
4.05 M'DI			14.98	4.15	5 01	6.01)	205	117	( previously -	
<u>00100</u>	+ +		1711	4.00	5:01	6.40	203	110	pulmored	
a 11		N III	17.00	U.17	5,00	6.45	101	210	Dilvard approx	
9.14		u(	24.85	-1, F >	10.01	6-47	2001	21.9	- hound abbient	
								1	18 hrs on	
						17			7177 and	
						AC	$ \rightarrow $		TILL OUTION	
					-T.	NH-	T		7(27)	
						PU,			· · · ·	
	Stabilizatio	on Criteria:		+/- 3 mS/cm	+/- 0.3 mg/L	+/- 0.1 pH units	+/- 10 mV	<50 NTU	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.	

-



Boring ID MW-05B



Start Time	7/21/2020
End Time	7/21/2020
Drilling Method	Geoprobe
Sampling Method	5' Macrocore

ADT Driller Sunny 85 deg F Weather Logged By T. Simmons, AKRF

Latitude Longitude Surface Elev. (ft) TBD (NAVD 88)

TBD	
TBD	
TBD	

Sampling M

ш Ш	VERY	logy	Soil Des	script	tion Surface	ЯО	TURE	(mqq	L.	Sample ID
DEP	(i (i	Litho	Condi	ition:	Concrete	8	NOIS	) aig	NA	Sample ID
0 1 2	33		CONCRETE SLAB Dark Brown SAND, some Silt, trace fine Gravel, Brick, Coal, Ash.	0	FLUSHMOUNT LOCKING WELLBOX JPLUG	ND	DRY	ND 4.1		
3 4 5 6 7 8	44			3 4 5 6 7 7	BACKFILL	ND	DRY	ND	ND	
89 10 11 12	35			9 9 10 11 12	BENTONITE	ND	DRY	ND	ND	
13 14 5	38		SLOUGH	13 — 14 — 15 —	NO. 2 MORIE SAND PACK 2" PVC 20 SLOT WELL SCREEN	ND	MOIST	ND	ND	
16 17 18			trace fine Gravel.	16 17 18 18	End Cap		WEI			
19 20 21	52		SLOUGH	20 20 21 21	*	ND	WET	ND 2.8	ND	
22- 23- 24- 25-			some Silt, fine Gravel.	22 23 24 25						
	ı Nativ	re	Surface							

Fill

Notes:

Stabilized groundwater measured at 15 feet below top of casing on 7/21/2020 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

<b>Borehole Completion/Monitoring</b>	Well Installation Log
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AKRF Project ID \_\_180291\_

Boring ID MW-06B



PT H (ft)	:OVERY (in)	nology	Soil Description	DOR	ISTURE	(udd) (	WPL	Sample ID
	Ш.	Ē	Surface Condition: Concrete	0	<b>₽</b>	E	9728	
0_	30		CONCRETE SLAB	ND	DRY			
			Dark Brown SAND, some fine Gravel, trace				ND	
$\begin{vmatrix} 2 - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ -$		$\rangle$	Silt, Concrete.			10.1		
4						. 3		
6-	42		Brown SAND, some Silt.	ND	DRY	21.2	ND	
			Gray SAND, some Silt. 8			0.7		
9-		, ; ; ; ; ; ;						
10-	12	· · · ·			Moist	57		
<u>1</u> 1–	42	,			WOISt	5.7		
12-	1	· , · , - , · ,	12					
13-		, , , , , , , , ,						
14-		, , , , , , , , , , , , , , , , , , ,						
1 <u>5</u>	58	, , ; ; ; ;	Gray SAND, some Silt.	ND	WET	ND	ND	
16_								· · · · · · · ·
17_		, , , , , , ,						
18_		· , · , · , · ,						
		, , , , , , , , , , , , , , , , , , ,	Brown SAND, some fine 19 2" PVC 20 SLOT WELL SCREEN					
	52		Brown SAND, some fine	ND	WET_	0.4	ND	
21-		, , , , , , ,						
22-		, , , , , , , , , , , , , , , , , , ,				ND		
23-								
25-			End Cap					
	Nativ	'e		1	L			ι

Fill

Notes:

Stabilized groundwater measured at 15 feet below top of casing on 7/21/2020 Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are using the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

**CAK**RF



AKRF Project ID 180291

Boring ID MW-08B

Start Tim	ne		7/21/2020			Dril	ler	ADT		La	titude		TBD
End Tim	0		7/21/2020			Wo	athor	Sunny	85 deg F	Lo	ngituc	le	
Drilling N	c lethod	d	Geoprobe					T. Simr	nons, AKRF	Su	rtace	Elev. (ft	
Sompling		had	5' Macrocore			LUG	Jgeu Dy		,	(IN)	VD 00)		
Sampling	y weu	nou			_								
Ĺ,			1										
(¥)	(ERY	λBc	Soil	Des	crip	otion			ж.	URE	(mq	_	
EPT	in CO	ithol	Surface Cor	nditic	on: (	Concrete	e		ogo	OIST	d) Cl	NAF	Sample ID
	R					FLUS		OCKING		Σ	•		
	26		CONCRETE SLAB				W	ELLBOX	ND	DRY	ND		
1			Brown SAND, trace fine Gravel, Roots, Glass.	1			_	- JPLUG				ND	
2-				2—								-	
3-				3									
4-				4									
	44	$\sum$	SLOUGH	<u> </u>					ND	DRY	ND	ND	
6		;	Gravel.	6			—— В	ACKFILL					
7				7_		🕂 2" SOLIE	PVC WEL	L RISER					
8-				8—									
9		,		9									
		· ,		10									
	48		Brown SAND, trace fine Gravel.						ND	DRY	ND	ND	
		<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,											
		''		12-				NTONITE					
13		· , ' , , ' ,		13—	1.00							-	
14—		, , , , , , , , , , , , , , , , , , ,		14—	2 2 4 6 2 2 4 6 2 2 4 6 2 4 6	32							
15-	52	,, ,	Brown SAND trace fine	15—	2 XK				ND	DRV	ND	ND	
_16-	52	, , , , , , , , , , , , , , , , , , ,	Gravel.	16	2 XX	12 12 12 12 12 12 12 12 12 12 12 12 12 1				BIXI			
17_		· , , , ,		17_	2 X4 2 X4 2 X4	10							
		,, ,,		<u> </u>									
		;,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		18		<b>→</b> NO. 2 M		ND PACK		WET			
19		, <i>; ;</i> ,		19—	2.24	2" F	PVC 20 SLO	OT WELL SCREEN					
20_	21	, , , , , , , , , , , , , , , , , , ,	Red/Brown SAND, some	20—	2 X6 2 X6 2 X6	114 126 126			ND	WET	ND	ND	
21-		·	fine Gravel, trace Silt.	21—	1 X 6 1 X 6 1 X 6	26 26 26							
22		, <u>, , , ,</u>		22	2.26	16 16 16							
		<i>, , ,</i> ,		23	246	16 16 16							
		, , , , , , , , , , , , , , , , , , ,			- 88 - 24 - 24	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
		, , , , , , , , , , , , , , , , , , ,		24				End Cap					
25-				25—									
	Nativ	'e	Surface										

Fill Notes:

Stabilized groundwater measured at 16.6 feet below top of casing on 7/21/2020

Soil samples submitted for laboratory analysis.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

APPENDIX F Excavation Work Plan

## APPENDIX F EXCAVATION WORK PLAN

#### 1.1 Notification

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination or breach or alter the Site's cover system, the Site owner or their representative will notify the New York State Department of Environmental Conservation (NYSDEC) contacts listed in the table below. The information on this table will be updated as necessary to provide accurate contact information. A full listing of Site-related contact information is provided in Appendix B of this Site Management Plan (SMP).

Agency	Name, Role	<b>Contact Information</b>							
NYSDEC	Michael MacCabe, Project Manager	(518) 402-9687							
NYSDEC	Sarah Quandt, Section Chief	(518) 402-9116 (office)							
NYSDEC	Jane O'Connell, Regional Chief	(718) 482-4599 (office)							
NYSDOHSteven Berninger, Project Manager(518) 402-7860									
Note:									
<sup>1</sup> Contacts are	e subject to change and will be updated as no	ecessary.							

Table IKey Regulatory Contacts1

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for Site re-grading, intrusive elements or utilities to be installed below the building footprint or 15 feet below grade, estimated volumes of contaminated soil to be excavated, and any work that may impact an Engineering Control (EC);
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work, and submittals (e.g., reports) to NYSDEC documenting the completed intrusive work;
- A summary of the applicable components of this Excavation Work Plan (EWP);
- A statement that the work will be performed in compliance with this EWP and 29 Code of Federal Regulations (CFR) 1910.120;
- A copy of the contractor's Health and Safety Plan (HASP), in electronic format, if it differs from the HASP provided in Appendix G of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP. The alteration, restoration and

modification of engineering controls must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

### **1.2** Soil Screening Methods

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional (QEP) during all remedial and development excavations into known or potentially contaminated material (remaining contamination). A QEP as defined in 6 New York Codes, Rules and Regulations (NYCRR) Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State will perform the screening. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion (COC).

Soil will be segregated into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil based on previous environmental data, and on the field screening results.

#### **1.3** Stockpile Methods

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook, maintained at the Site, and available for inspection by NYSDEC.

### **1.4 Materials Excavation and Load Out**

A QEP or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the Site and its contractors are solely responsible for safe execution of all invasive and other work performed under this EWP.

The presence of utilities and easements on the Site will be investigated by the QEP. It will be determined whether a risk or impediment to the planned work under the SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements). Trucks transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides.

A truck wash will be operated on-site if deemed appropriate by NYSDEC. The QEP will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking.

The QEP will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

#### **1.5 Materials Transport Off-Site**

All transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the Site will be secured with either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are described as follows:

- For Trucks Heading North: Head northwest on Woodward Avenue and turn left onto Metropolitan Avenue, then turn left onto Vandervoort Avenue to merge onto Interstate 278 North.
- For Trucks Heading South: Head northwest on Woodward Avenue and turn left onto Metropolitan Avenue, then turn left onto Vandervoort Avenue to merge onto Interstate 278 South.

These are the most appropriate routes and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting offsite queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; (f) overall safety in transport; and (g) community input.

All trucks loaded with Site materials will exit the vicinity of the Site using these truck routes; however, the truck route is subject to change depending on available truck routes at the time of the work (pending road closures, etc.), and trucking company input related to the allowable truck routes.

Trucks will be prohibited from stopping and idling in the neighborhood outside the Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-site to the extent practicable to minimize off-site disturbance. Off-site queuing will be prohibited.

### **1.6 Materials Disposal Off-Site**

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material, and will be transported and disposed in accordance with all local, state (including 6 NYCRR Part 360), and federal regulations. If disposal of soil/fill from this Site is proposed for unregulated off-site disposal (i.e., clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility, if appropriate [i.e., hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, Construction and Demolition (C&D) debris recycling facility, etc.]. Actual disposal quantities

and associated documentation will be reported to NYSDEC in the Periodic Review Report (PRR). This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading, and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Track 1 Unrestricted Use Soil Cleanup Objectives (UUSCOs) is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility).

#### 1.7 Materials Reuse On-Site

Chemical criteria for on-site reuse of material will meet the NYSDEC Part 375 Commercial Soil Cleanup Objectives (CSCOs) for the approved use of the Site consistent with the Environmental Easement. The QEP, as defined in 6 NYCRR Part 375, will ensure that procedures defined for materials reuse in the SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. Contaminated on-site material may only be used beneath the site cover as backfill for subsurface utility lines with prior approval from the DEC project manager.

Proposed materials for reuse on-site must be sampled for full suite analytical parameters, including per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10, unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5, Allowable Constituent Levels for Imported Fill or Soil, for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [November 2022] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

Soil/fill material for reuse on-site will be segregated and staged as described in Sections 1.2 and 1.3 of this EWP. The anticipated size and location of stockpiles will be provided in the 15-day notification to the NYSDEC project manager. Stockpile locations will be based on the location of Site excavation activities and proximity to nearby Site features. Material reuse on-site will comply with the requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site will not be reused on-site.

### 1.8 Fluids Management

All liquids to be removed from the Site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported, and disposed in accordance with applicable local, state, and federal regulations. Dewatering, purge, and development fluids will not be recharged back to the land surface or subsurface of the Site but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e., a local pond, stream or river) will be performed under a State Pollutant Discharge Elimination System (SPDES) permit.

### **1.9** Cover System Restoration

After the completion of soil removal and any other invasive activities, the cover system will be restored in a manner that complies with the Decision Document (DD). The existing cover system is comprised of a minimum of 12 inches of concrete building slabs and at least 4 inches of asphalt pavement above at least 8 inches of clean backfill material in parking areas. The Site Cover System also consists of a 20-mil vapor barrier/waterproofing membrane installed beneath the cellar slab (Grace Preprufe<sup>®</sup> 300R) and behind subgrade foundation walls (Grace Preprufe<sup>®</sup> 160R). A demarcation layer, consisting of orange snow fencing material, white geotextile or equivalent material, etc. will be installed to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent PRR and in an updated SMP. The alteration, restoration and modification of engineering controls must conform with Article 145 Section 7209 of the Education Law regarding the application professional seals and alterations.

### **1.10 Backfill from Off-Site Sources**

All materials proposed for import onto the Site will be approved by the QEP and will be in compliance with provisions in this SMP prior to receipt at the Site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater criteria, and protection of ecological resources criteria, the resulting soil quality standards to be used at the Site are CSCOs. Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

#### **1.11** Stormwater Pollution Prevention

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook, maintained at the Site, and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be
inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

### 1.12 Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during postremedial subsurface excavations or development-related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment, and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes [Target Analyte List (TAL) metals, Target Compound List (TCL) volatiles and semivolatiles, TCL pesticides and polychlorinated biphenyls (PCBs)], unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's project manager. Reportable quantities of petroleum product will be reported to the NYSDEC Spills Hotline. These findings will also be included in the periodic reports prepared pursuant to Section 7.0 of this SMP.

### 1.13 Community Air Monitoring Plan

During any excavation activity initiated under the SMP, air monitoring will be conducted in accordance with the Community Air Monitoring Plan (CAMP) included as Appendix G of the SMP. Work zone monitoring will be performed for the health and safety of workers during interior intrusive work activities in accordance with the action levels and guidance outlined in the Site-specific HASP. In summary, the CAMP calls for real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when intrusive activities are in progress at the Site. Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas. Continuous monitoring is required for all ground intrusive activities to the extent practicable (e.g., air monitoring may not be conducted during precipitation events).

VOC and particulate monitoring equipment will consist of a photoionization detector (PID) capable of detecting the VOCs found in the excavated soil and real-time aerosol or particulate monitoring equipment capable of measuring particulate matter less than 10 micrometers in size ( $PM_{10}$ ). VOC monitoring equipment will be calibrated, and the particulate monitoring equipment zeroed, on a daily basis and documented in a dedicated field logbook. Both VOC and particulate monitoring equipment will be calculating 15-minute running average concentrations, which will be compared to the prescribed action levels.

If VOC monitoring results in the ambient air concentration of total organic vapors in excess of 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases below 5 ppm over background, work activities can resume with measures taken to reduce vapors and continue monitoring. If total organic vapor levels persist at levels in excess of 5 ppm over background, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. If the organic vapor level is repeatedly over 25 ppm above background, activities will be shut down and the ECs and the Site work plan re-evaluated.

If particulate monitoring results in a 15-minute average concentration measurement that is between 100 micrograms per cubic meter ( $\mu g/m^3$ ) and 150  $\mu g/m^3$  above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action will be taken to protect Site personnel and reduce the potential for contaminant migration. Should dust suppression measures being utilized not lower particulates to an acceptable level (e.g., below 150  $\mu g/m^3$  above the background level, with no visible dust from the work area), work will be suspended until appropriate corrective measures are implemented to remedy the situation.

Details regarding work zone and community air monitoring are outlined in the HASP attached as Appendix G. Exceedances of action levels listed in the CAMP will be reported to the NYSDEC and New York State Department of Health (NYSDOH) project managers. These locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations. Exceedances of action levels listed in the CAMP will be reported to the NYSDEC and NYSDOH Project Managers.

### 1.14 Odor Control Plan

This odor control plan is capable of controlling emissions of nuisance odors off-site. Specific odor control methods to be used on a routine basis will include (a) through (f), as outlined in the following paragraph. If nuisance odors are identified at the Site boundary, or if odor complaints are received, 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 any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's QEP, and any measures that are implemented will be discussed in the PRR.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

### 1.15 Dust Control Plan

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the following items:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas, including excavations and stockpiles;
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production;
- Gravel will be used on unpaved roadways to provide a clean and dust-free road surface; and
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

## 1.16 Other Nuisances

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

APPENDIX G

HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

# QUEENS ANIMAL SHELTER AND CARE CENTER

**151 WOODWARD AVENUE** 

# **QUEENS, NEW YORK**

# **Community Air Monitoring Plan**

AKRF Project Number: 180291 NYSDEC BCP Site Number: C241230

### **Prepared for:**

New York State Department of Environmental Conservation Division of Environmental Remediation, Remedial Bureau B 625 Broadway, 12<sup>th</sup> Floor Albany, New York 12233

### on Behalf of:

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### **NOVEMBER 2023**

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### FIGURE

Figure 1 – Site Location

# APPENDIX

Appendix A – NYSDOH Generic CAMP

# **1.0 INTRODUCTION**

### 1.1 Purpose

This Community Air Monitoring Plan (CAMP) was prepared by AKRF, Inc. (AKRF) on behalf of 1906 Flushing LLC (the Volunteer) for the Queens Animal Shelter and Care Center (QACC) site located at 151 Woodward Avenue in Queens, New York (hereafter referred to as the Site). The Site, which is also referred to at the address 1906 Flushing Avenue, is identified on the New York City Tax Map as Queens Borough Block 3376, Lot 1. The Site was remediated under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) (BCP Site No. C241230). The Site location is shown on Figure 1.

The Site was remediated to NYSDEC Part 375 Commercial Soil Cleanup Objectives (CSCOs) (Track 4 cleanup) in general accordance with the October 2019 NYSDEC-approved Remedial Action Work Plan (RAWP) and Decision Document (DD). A Site Management Plan (SMP) was prepared to manage remaining contamination at the Site, as required by the Environmental Easement (EE). The EE is an Institutional Control (IC) restricting the type of use at the Site after completion of the remedial program under the RAWP. Details on the Site environmental history and remedial activities performed under the RAWP are provided in the SMP.

Engineering Controls (ECs) have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. The following ECs were installed at the Site: (1) a Site Cover System; (2) an active Sub-slab Depressurization System (SSDS); and (3) a groundwater Biosparge System. An EE granted to NYSDEC and recorded with the Queens County Clerk requires compliance with the SMP, and all ECs and ICs placed on the Site.

The ICs place restrictions on Site use and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. The SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the EE for contamination that may remain at the Site. The SMP has been approved by NYSDEC, and compliance with the plan is required by the grantor of the EE and the grantor's successors and assigns. The SMP may be revised only with the approval of NYSDEC.

This CAMP, which is an appendix to the SMP, details the procedures required for monitoring work space air quality during any activities performed at the Site under the SMP that require management of residual contamination at the Site. All workers who participate in activities at the Site that are under the direction of AKRF or the Site owner are required to comply with the provisions specified in this CAMP.

# 2.0 SITE HISTORY AND BACKGROUND

Prior to remediation and redevelopment, the Site was used as an automobile wrecking and salvage facility since approximately 1962. Operations at the Site ceased on June 17, 2019. Prior to redevelopment, the Site contained two permanent structures: a one-story masonry and wood frame garage formerly used for storage, vehicle dismantling, and repairs; and a one-story masonry and steel frame garage building with a mezzanine level. Exterior portions of the Site were concrete-paved, and residual petroleum staining from the former automobile wrecking operations was present across a majority of the Site. The Site now consists of a slab-on-grade, two-story animal shelter and care center with exterior parking lots along the northern and southern property boundaries.

Between December 2019 and May 2023, the Site was remediated in accordance with the NYSDECapproved RAWP. The remedial elements performed consisted of the following:

- 1. Excavation and off-site disposal of approximately 2,550 tons (1,700 cubic yards) of soil, which included the upper one foot of soil/fill across the Site and source material identified in the central portion of the Site (approximately 25 feet by 25 feet by 7 feet deep). It is estimated that an additional 21,300 tons (14,200 cubic yards) of soil/fill were excavated as part of construction of the new building. In addition, the sludge on the concrete cap and a 250-gallon petroleum aboveground storage tank (AST) were removed in accordance with applicable regulations.
- 2. Collection and analysis of 54 documentation samples to document remaining contamination after completion of the remedial actions.
- 3. Construction and maintenance of a Site Cover System to allow for restricted commercial use of the Site. The cover consists of exterior asphalt and concrete pavement, and a concrete building slab.
- 4. The performance of an *in-situ* groundwater treatment program and installation of post-remedial monitoring wells. Subsequent monitoring of benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX) and methyl tert butyl ether (MTBE) will be implemented. Prior to the full implementation of this technology, laboratory and on-site pilot scale studies will be conducted to more clearly define design parameters.
- 5. Installation of an active SSDS and Biosparge System beneath the new building to prevent vapor intrusion.
- 6. Installation of support of excavation (SOE) necessary to enable excavation of soil/fill for remediation and building construction.
- 7. Implementation of a CAMP during all intrusive Site activities to monitor levels of volatile organic compounds (VOCs) and airborne particulates within the active work zones and around the perimeter of the Site.
- 8. Screening for indications of contamination of soil [by visual means, odor, and monitoring with photoionization detector (PID)] during intrusive Site work.
- 9. Importation of fill meeting the requirements of 6 New York Codes, Rules, and Regulations (NYCRR) Part 375-6.7(d) to replace excavated soil/fill and/or establish the designed grades at the locations of any impervious areas.

# **3.0 AIR MONITORING**

Community air monitoring will be conducted during all intrusive Site activities in compliance with the New York State Department of Health (NYSDOH) Generic CAMP and this Site-specific CAMP. The NYSDOH Generic CAMP as described in NYSDEC's DER-10 Appendix 1A and 1B is included as Attachment A, and states the following:

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 ( $\mu g/m^3$ ) 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  $\mu g/m^3$  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  $\mu$ g/m3 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  $\mu$ g/m<sup>3</sup> 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.

Real-time air monitoring for VOCs and dust at the perimeter of the exclusion zone will be performed as described below. Exceedances of CAMP action levels will be immediately reported to the NYSDEC and NYSDOH project managers, and CAMP reports will be included in the daily reports submitted to NYSDEC and NYSDOH.

### **3.1** Roving Air Monitoring

### VOC Monitoring

Continuous monitoring for VOCs will be conducted during all ground intrusive activities, including excavation and tank removal activities. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs will be monitored continuously at the downwind perimeter of the exclusion zone. Monitoring will be conducted with a PID equipped with a 10.7 electron Volt (eV) lamp capable of calculating 15-minute running average concentrations.

Periodic monitoring for VOCs will be conducted during any non-intrusive activities, such as the collection of excavation endpoint soil samples. Periodic monitoring may include obtaining measurements upon arrival at the work area on-site and upon leaving the work area on-site.

More frequent intervals of monitoring will be conducted if required as determined by the Site Safety Officer (SSO). All PID readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

### Particulate Monitoring

Continuous monitoring for particulates will be conducted during all ground intrusive activities and will involve the measurement of respirable dust. Community air monitoring for dust particulates will be conducted using an MIE 1000 Personal DataRam or equivalent to measure the concentration of airborne respirable particulates less than 10 micrometers in size (PM<sub>10</sub>). The dust monitor will be capable of calculating 15-minute running average concentrations and equipped with an audible alarm to indicate exceedance of action levels. Background readings and any readings that trigger response actions will be recorded in the project logbook, which will be available on-site for NYSDOH and/or NYSDEC review.

### **3.2** Fixed Air Monitoring Stations

Three fixed air monitoring stations will be operated at the Site during soil disturbing activities. Two fixed air monitoring stations will be set up at the upwind and downwind perimeters of the exclusion zone during all ground intrusive activities and will continuously log VOC and particulate levels. A third fixed air monitoring station will be placed between the work area and the walls of the northeast-adjacent occupied structure. Each fixed monitoring station will be fully enclosed and equipped with the following:

- A PID equipped with a 10.6 eV lamp capable of calculating 15-minute running average VOC concentrations;
- A TSI 8530 DustTrak II or equivalent dust monitor capable of measuring the concentration of airborne respirable particulates less than 10 micrometers in size (PM<sub>10</sub>) and calculating 15-minute running average particulate concentrations; and
- A Netronix<sup>™</sup> Thiamus<sup>™</sup> ICU-820 or equivalent Global System for Mobile Communication (GSM)/Global Positioning System (GPS) device capable of recording air monitoring and location data.

Each monitoring station will be capable of sending e-mail alerts to the SSO to indicate an exceedance of action levels. Additionally, the SSO will conduct an inspection of the monitoring stations on at least an hourly basis. Upon completion of Site activities, all air monitoring data will be available to download via the iEnvironet<sup>®</sup> website. All air monitoring data recorded at the fixed monitoring stations will be available for NYSDOH and/or NYSDEC review and will be included in the Final Engineering Report (FER).

Since work areas at this Site may be within 20 feet of potentially exposed populations, additional Site-specific CAMP air monitoring provisions will be implemented (as necessary) to ensure that residents of the northeast-adjacent structure are not exposed to Site-related contaminants during construction activities. The additional CAMP provisions include:

- Potential use of engineering controls such as vapor/dust barriers or special ventilation devices; and
- Attempting to implement planned activities when potentially exposed populations are at a minimum.

#### 3.3 Community Air Monitoring Action Levels

### VOC Action Levels

The following actions will be taken based on organic vapor levels measured:

• If total organic vapor levels exceed 5 parts per million (ppm) above background for the 15minute average at the exclusion zone perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the exclusion zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the hot 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 above background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the exclusion zone, activities will be shutdown.

### Particulate Action Levels

The following actions will be taken based on particulate levels measured:

- If the downwind particulate concentrations are greater than  $100 \ \mu g/m^3$  above background (upwind concentrations), and no other obvious source is apparent, then it will be assumed that the elevated particulate concentrations are a result of Site activities. In such instances, dust suppression measures will be implemented and monitoring will be continued. Work will be allowed to continue with dust suppression if downwind particulate levels do not exceed 150  $\mu g/m^3$  above the background (upwind concentration) and provided that no visible dust is migrating from the work area.
- If particulate levels persist at 150  $\mu$ g/m<sup>3</sup> above the background, work must be stopped until dust suppression measures bring particulate levels to below 150  $\mu$ g/m<sup>3</sup> above background.

The following Site-specific CAMP provisions will be implemented at the Site, as necessary:

- If total VOC concentrations near the outside walls or next to the intake vents of the northeast-adjacent occupied structure (from the third fixed air monitoring station) exceed 1 ppm, air monitoring should occur within the occupied structure; and
- If total particulate concentrations near the outside walls or next to the intake vents of the northeast-adjacent occupied structure (from the third fixed air monitoring station) exceed  $150 \ \mu g/m^3$ , work activities should be suspended until controls are implemented.

### Major Vapor Emission Response Plan

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the Site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or vapor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the exclusion zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone).

If either of the following criteria is exceeded in the 20-foot zone, then the Major Vapor Emission Response Plan shall automatically be implemented:

• Sustained organic vapor levels approaching 1 ppm above background for a period of more than 30 minutes; or

• Organic vapor levels greater than 5 ppm above background for any time period.

Upon activation, the following activities shall be undertaken as part of the Major Vapor Emission Response Plan:

- NYSDEC, NYSDOH, and local police authorities will be immediately contacted by the SSO and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the SSO; and
- All Emergency contacts will go into effect as appropriate.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

FIGURE



APPENDIX A NYSDOH GENERIC CAMP

# 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 <u>ground intrusive</u> 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 <u>non-intrusive</u> 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<sup>3</sup> 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<sup>3</sup> 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<sup>3</sup> 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

# Appendix 1B Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

- (a) Objects to be measured: Dust, mists or aerosols;
- (b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);

(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;

(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);

- (e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;
- (h) Logged Data: Each data point with average concentration, time/date and data point number

(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;

(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;

(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;

(1) Operating Temperature: -10 to  $50^{\circ}$  C (14 to  $122^{\circ}$  F);

(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential-such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

# QUEENS ANIMAL SHELTER AND CARE CENTER

**151 WOODWARD AVENUE** 

**QUEENS, NEW YORK** 

# Health and Safety Plan

AKRF Project Number: 180291 NYSDEC BCP Site Number: C241230

### **Prepared for:**

New York State Department of Environmental Conservation Division of Environmental Remediation, Remedial Bureau B 625 Broadway, 12<sup>th</sup> Floor Albany, New York 12233

### On Behalf of:

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# **1.0 INTRODUCTION**

### 1.1 Purpose

This Health and Safety Plan (HASP) was prepared by AKRF, Inc. (AKRF) on behalf of 1906 Flushing LLC (the Volunteer) for the Queens Animal Shelter and Care Center (QACC) site located at 151 Woodward Avenue in Queens, New York (hereafter referred to as the Site). The Site is identified on the New York City Tax Map as Queens Borough Block 3376, Lot 1. The Site was remediated under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) (BCP Site No. C241230). The Site location is shown on Figure 1.

The Site was remediated to NYSDEC Part 375 Commercial Soil Cleanup Objectives (CSCOs) (Track 4 cleanup) in general accordance with the October 2019 NYSDEC-approved Remedial Action Work Plan (RAWP) and Decision Document (DD). A Site Management Plan (SMP) was prepared to manage remaining contamination at the Site, as required by the Environmental Easement (EE). The EE is an Institutional Control (IC) restricting the type of use at the Site after completion of the remedial program under the RAWP. Details on the Site environmental history and remedial activities performed under the RAWP are provided in the SMP.

Engineering Controls (ECs) have been incorporated into the Site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. The following ECs were installed at the Site: (1) a Cover System; (2) an active Subslab Depressurization System (SSDS); and (3) a Biosparge System. An EE granted to NYSDEC and recorded with the Queens County Clerk requires compliance with the SMP, and all ECs and ICs placed on the Site.

The ICs place restrictions on Site use and mandate operation, maintenance, monitoring, and reporting measures for all ECs and ICs. The SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the EE for contamination that may remain at the Site. The SMP has been approved by NYSDEC, and compliance with the plan is required by the grantor of the EE and the grantor's successors and assigns. The SMP may be revised only with the approval of NYSDEC.

This HASP, which is an appendix to the SMP, details the procedures required to manage known or potential residual contamination following completion of the remedial action (RA) at the Site. The purpose of this HASP is to assign responsibilities, establish personnel protection standards and mandatory safety practices and procedures, and provide contingency plans for situations that may arise during Site management inspections, operation and maintenance (O&M), periodic sampling activities, and any soil/fill disturbance activities conducted at the Site. This HASP takes into account the specific hazards inherent to the Site, and presents procedures to be followed by AKRF and contractors to avoid, and if necessary protect against, health and/or safety hazards. Application of this HASP should be considered on a task-by-task basis, as not all measures are applicable or necessary for all activities on-site. On-site work activities should comply with applicable parts of the United States Occupational Safety and Health Administration (OSHA) Regulations, primarily 29 Code of Federal Regulations (CFR) Parts 1910 and 1926. A copy of this HASP will be maintained on-site during all work performed under the SMP.

All workers who participate in activities at the Site that are under the direction of AKRF or the Site owner are required to comply with the provisions specified in this HASP. All Site visitors who enter designated work zones must also comply with this HASP. Refusal or failure to comply with this HASP or violation of any safety procedures by field personnel and/or subcontractors performing work covered by this HASP may result in immediate removal from the Site following

consultation with the Site owner's representative. No personnel are permitted to enter permit confined spaces under this HASP.

### 1.2 Scope

This HASP has been developed to address health and safety concerns during Site O&M, monitoring, and inspections after completion of the Site remedy, under the direction of AKRF and any of AKRF's sub-contractor(s), as specified in the SMP. Although this HASP addresses all activities listed herein, work at the individual locations may include all or only some of these tasks. On-site work anticipated under the SMP includes the following tasks:

- Assessing achievement of the remedial performance criteria (e.g., inspections of the SSDS, Biosparge System, and the Site Cover System);
- Sampling and analysis of appropriate media (e.g., groundwater, sub-slab soil vapor or indoor air); and
- O&M of the ECs (SSDS, Biosparge System, and Site Cover System), which may include disturbance and handling of Site soil/fill.

### 1.3 Application

This HASP applies to all personnel involved in the above tasks under the direction of the Site owner or AKRF, or those who wish to gain access to active intrusive work areas, including:

- Owner's representatives, contractors, and subcontractors performing tasks under the direction of AKRF, the owner, and/or the owner's representative;
- Federal, state, or local representatives;
- AKRF or the contractor's employees or subcontractors; and
- AKRF and its subcontractors.

# 2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section specifies the project team's project organization.

### 2.1 Remedial Engineer (RE)

Ms. Michelle Lapin, P.E. will serve as the RE under the SMP. As the RE, Ms. Lapin will oversee O&M of ECs under the SMP.

### 2.2 **Project Director**

The project director is Ms. Deborah Shapiro of AKRF. Ms. Shapiro's responsibilities include the following:

- Plan, schedule, and manage implementation of remediation activities;
- Coordinate with the Site Manager (SM), Site Supervisor (SS), and Project Environmental Safety Manager (PESM) to ensure that health and safety requirements are met;
- Ensure that field work is scheduled with adequate personnel and equipment resources to complete the job safely and enforce Site health and safety rules;
- Conduct periodic inspections;
- Participate in incident investigations;
- Ensure this HASP has all of the required approvals before any Site work is conducted;
- Ensure that the SM is informed of project changes that require modifications to this HASP; and
- Assume overall project responsibility for project health and safety.

### 2.3 Site Manager (SM)

The SM is Mr. Michael Bates of AKRF. The SM's responsibilities include the following:

- Manage day-to-day implementation of the Site safety measures specified in this HASP;
- Ensure that adequate communication between field crews, health and safety monitoring personnel, and emergency response personnel is maintained;
- Confirm that the Site's field personnel are adequately trained and qualified to work at the Site and that proper personal protective equipment (PPE) is utilized by field teams;
- Investigate and report all accidents/incidents to the Project Director and PESM;
- Conduct and documents periodic safety briefings;
- Stop work if necessary based on health and safety monitoring;
- Act as the primary point of contact for Site-related activities and coordination with non-project-related Site operations;
- Identify operational changes that require potential modifications to health and safety procedures and Site safety plans, and reports such changes to the Project Director and PESM;
- Conduct health and safety monitoring activities;
- Determine upgrades or downgrades of PPE based on Site conditions and/or real-time monitoring results;

- Ensure that monitoring instruments are calibrated; and
- Report to the project director and PESM to provide summaries of field operations and progress.

### 2.4 Project Environmental and Safety Manager (PESM)

The PESM is a qualified health and safety professional with experience in hazardous waste Site remediation activities. The PESM is Mr. Patrick Diggins of AKRF. The PESM responsibilities include the following:

- Provide for the development and approval of the HASP;
- Serve as the primary contact to review health and safety matters that may arise;
- Approve revised or new safety protocols for field operations;
- Coordinate revisions of this HASP with field personnel;
- Coordinate upgrading or downgrading of PPE with the SM;
- Assist in the investigation of all accidents/incidents; and
- Enforce work stoppage following reporting of on-site activities from the Project Director and PESM.

### 2.5 Site Supervisor (SS)

The SS will be appointed from the owner's contractor. If work is being performed solely by AKRF, the SS tasks would be performed by the SM (Section 2.3). The SS responsibilities include the following:

- Provide for the necessary training of field crews in accordance with OSHA regulations and provide proof of training to the SM prior to entering the Site;
- Conduct routine safety inspections of work areas;
- Conduct incident investigations and, together with the SM, prepare appropriate reports;
- Enforce health and safety rules and compliance with this HASP; and
- Plan field work using appropriate safe procedures and equipment.

### 2.6 Site Personnel

The Site Personnel responsibilities include the following:

- Report any unsafe or potentially hazardous conditions to the SM;
- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP;
- Comply with the rules, regulations, and procedures as set forth in this HASP and any revisions;
- Prevent unauthorized personnel from entering work sites; and
- Inspect all tools and equipment, including PPE, prior to use.

# **3.0 SITE HISTORY AND BACKGROUND**

Prior to remediation and redevelopment, the Site was used as an automobile wrecking and salvage facility since approximately 1962. Operations at the Site ceased on June 17, 2019. Prior to redevelopment, the Site contained two permanent structures: a one-story masonry and wood frame garage formerly used for storage, vehicle dismantling, and repairs; and a one-story masonry and steel frame garage building with a mezzanine level. Exterior portions of the Site were concrete-paved, and residual petroleum staining from the former automobile wrecking operations was present across a majority of the Site. The Site now consists of a slab-on-grade, two-story animal shelter and care center with exterior parking lots along the northern and southern property boundaries.

Between December 2019 and May 2023, the Site was remediated in accordance with the NYSDECapproved RAWP. The remedial elements performed consisted of the following:

- 1. Excavation and off-site disposal of approximately 2,550 tons (1,700 cubic yards) of soil, which included the upper one foot of soil/fill across the Site and plus additional petroleum source material identified in the central portion of the Site (approximately 25 feet by 25 feet by 7 feet deep). It is estimated that an additional 21,300 tons (14,200 cubic yards) of soil/fill were excavated as part of construction of the new building. In addition, the sludge on the concrete cap and a 250-gallon petroleum aboveground storage tank (AST) were removed in accordance with applicable regulations.
- 2. Collection and analysis of 54 documentation samples to document remaining contamination after completion of the remedial actions.
- 3. Construction and maintenance of a Site Cover System to allow for restricted commercial use of the Site. The cover consists of exterior asphalt and concrete pavement, and a concrete building slab.
- 4. The performance of an *in-situ* groundwater treatment program and installation of post-remedial monitoring wells. Subsequent monitoring of benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX) and methyl tert butyl ether (MTBE) will be implemented.
- 5. Installation of a Biosparge System to enhance the natural attenuation of dissolved BTEX and MTBE in groundwater.
- 6. Installation of an active SSDS into the new building to prevent vapor intrusion.
- 7. Installation of support of excavation (SOE) necessary to enable excavation of soil/fill for remediation and building construction.
- 8. Implementation of a CAMP during all intrusive Site activities to monitor levels of volatile organic compounds (VOCs) and airborne particulates within the active work zones and around the perimeter of the Site.
- 9. Screening for indications of contamination of soil [by visual means, odor, and monitoring with photoionization detector (PID)] during intrusive Site work.
- 10. Importation of fill meeting the requirements of 6 New York Codes, Rules, and Regulations (NYCRR) Part 375-6.7(d) to replace excavated soil/fill and/or establish the designed grades at the locations of any impervious areas.

# 4.0 POTENTIAL HAZARDS AT THE SITE

This section presents an assessment of the chemical, biological, and physical hazards that may be encountered at the Site.

### 4.1 Hazard Potential

The remediation has been completed; however, some residual contamination remains in the Site subsurface. Exposure to residual contamination is being prevented by the Site Cover System, which is designed to remain intact long-term. Disturbance of the concrete slabs, SSDS, and/or Biosparge System without prior NYSDEC approval is prohibited by the EE. In the unlikely event of an unanticipated, accidental, or required disturbance of the Cover System, or if any cracks or openings in the floor occur, they shall be properly sealed immediately and NYSDEC or its successor agency shall be notified.

### 4.2 **Properties of Chemical Contamination**

### 4.2.1 Chemical Hazards in Soil/Fill, Groundwater, and/or Soil Vapor

Potential chemical pathways that may be encountered include: dermal contact, inhalation, and/or ingestion hazards associated with contaminated soil/fill and/or soil vapor.

The potential health effects from on-site contamination are summarized in Table 1 and detailed in the United States Department of Health and Human Services Agency for Toxic Substances and Disease Registry (ATSDR) fact sheets attached in Appendix A.

Chemicals	<b>REL/PEL/STEL</b>	Health Hazards
Arsenic	$\begin{aligned} \text{REL} &= 0.002 \text{ mg/m}^3 \\ \text{PEL} &= \text{TWA } 0.010 \text{ mg/m}^3 \end{aligned}$	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, potential occupational carcinogen
Barium	$\begin{aligned} \text{PEL} &= 0.5 \text{ mg/m}^3 \\ \text{REL} &= 0.5 \text{ mg/m}^3 \end{aligned}$	Irritation eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia.
Benzene	REL = TWA 0.1 ppm PEL = TWA 1 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression.
Beryllium	REL = $0.0005 \text{ mg/m}^3$ PEL = TWA $0.002 \text{ mg/m}^3$	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen].
Cadmium	PEL = TWA 0.005 mg/m <sup>3</sup>	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen].
Chloroform	REL = 2 ppm PEL = 50 ppm	Irritation eyes, skin; dizziness, mental dullness, nausea, confusion; headache, lassitude (weakness, exhaustion); anesthesia; enlarged liver; [potential occupational carcinogen].
Chromium	$TWA = 1 mg/mg^3$	Irritation eyes, skin; lung fibrosis (histologic)

 Table 1

 Potential Health Effects from Remaining On-Site Contamination

Chemicals	<b>REL/PEL/STEL</b>	Health Hazards
Chrysene	$REL = TWA \ 0.1 \ mg/m^3$ $PFL = TWA \ 0.2 \ mg/m^3$	Dermatitis, bronchitis, [potential occupational carcinogen]
Copper	$REL = 1 mg/m^{3}$ $PEL = 1 mg/m^{3}$	Irritation eyes, nose, pharynx; nasal septum perforation; metallic taste; dermatitis; in animals: lung, liver, kidney damage; anemia
Diethyl Phthalate	$REL = TWA 5 mg/m^3$	Irritation eyes, skin, nose, throat; headache, dizziness, nausea; lacrimation (discharge of tears); possible polyneuropathy, vestibular dysfunc; pain, numb, lassitude (weakness, exhaustion), spasms in arms & legs
Ethyl Benzene	REL = TWA 100 ppm PEL = TWA 100 ppm	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma.
Iron	$REL = TWA 5 mg/m^{3}$ $PEL = TWA 10 mg/m^{3}$	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)
Lead	$\begin{aligned} REL &= 0.05 \text{ mg/m}^3 \\ PEL &= 0.05 \text{ mg/m}^3 \end{aligned}$	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension.
Manganese	$REL = 1 mg/m^3$ $PEL = 0.2 mg/m^3$	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low- back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage.
Methylene Chloride	PEL = TWA 25 ppm	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numb, tingle limbs; nausea.
Methyl Ethyl Ketone (2-Butanone)	REL = TWA 200 ppm PEL = TWA 200 ppm	Irritation eyes, skin, nose; headache; dizziness; vomiting; dermatitis.
Methyl tert-butyl ether (MTBE)	TLV = TWA 50 ppm	Headaches, nausea, dizziness, irritation of the nose or throat, and feelings of spaciness or confusion.
Mercury	$REL = 0.1 mg/m^3$ $PEL = 0.05 mg/m^3$	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria.
Naphthalene	REL = TWA 10 ppm PEL = TWA 10 ppm	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage.
Nickel	$REL = TWA \ 0.015 \ mg/m^3$ $PEL = TWA \ 1 \ mg/m^3$	Sensitization dermatitis, allergic asthma, pneumonitis; [potential occupational carcinogen].
Phenol	REL = TWA 5 ppm (19 mg/m <sup>3</sup> ) [skin] PEL = TWA 5 ppm (19 mg/m <sup>3</sup> ) [skin]	Irritation eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitching
Polychlorinated Biphenyls (PCBs)	$\begin{aligned} \text{REL} &= 0.001 \text{ mg/m}^3 \\ \text{PEL} &= 0.5 \text{ mg/m}^3 \\ (\text{skin}) \end{aligned}$	Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen].

 Table 1

 Potential Health Effects from Remaining On-Site Contamination

Chemicals	<b>REL/PEL/STEL</b>	Health Hazards
Polycyclic Aromatic Hydrocarbons (PAHs)	$PEL = 5 mg/m^3$	Harmful effects to skin, bodily fluids, and ability to fight disease, reproductive problems; potential carcinogen.
Selenium	$REL = TWA \ 0.2 \ mg/m^3$ $PEL = TWA \ 0.2 \ mg/m^3$	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns
Silver	$\begin{aligned} \text{REL} &= \text{TWA 0.01 mg/m}^3 \\ \text{PEL} &= \text{TWA 0.01 mg/m}^3 \end{aligned}$	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance.
Sodium	REL = 2 mg/m3 $PEL = TWA 2 mg/m3$	Irritation eyes, skin, mucous membrane; pneumonitis; eye, skin burns; temporary loss of hair
Toluene	PEL = TWA 200 ppm (750 mg/m <sup>3</sup> )	Central nervous system depression, causing fatigue, headache, confusion, paresthesia, dizziness, and muscular incoordination, irritation of the eyes, mucous membranes, and upper respiratory tract.
Trichloroethylene (TCE)	PEL = TWA 100 ppm	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen].
Xylenes	$REL = TWA 435 mg/m^3$ $PEL = TWA 435 mg/m^3$	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis
Zinc	REL = TWA 5 mg/m <sup>3</sup> PEL = TWA 5 mg/m <sup>3</sup>	Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function.
Comments:		

 Table 1

 Potential Health Effects from Remaining On-Site Contamination

REL = National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit

STEL = OSHA Short Term Exposure Limit

### 4.2.2 Other Chemical Hazards

Although not anticipated, chemicals not identified in this HASP may be used or encountered during Site work. Prior to the initiation of work at the Site, ATSDR Fact Sheets will be obtained for each of the chemicals to be used and all Site workers and visitors who may potentially be exposed will be made aware of the hazards.

### 4.3 Physical Hazards

Physical hazards will be addressed as necessary. More detailed safety procedures are provided as appendices to this HASP, where applicable.

### 4.3.1 Cold Stress

At certain times of the year, workers may be exposed to the hazards of working in cold environments. Potential hazards in cold environments include frostbite, trench/immersion foot, and hypothermia, as well as slippery surfaces and brittle equipment. A Cold Stress Program is provided as Appendix B.

### 4.3.2 Heat Stress

Heat stress is a significant potential hazard, which is greatly exacerbated with the use of PPE in hot environments. The potential hazards of working in hot environments include dehydration, cramps, heat rash, heat exhaustion, and heat stroke. A heat stress prevention program will be implemented when ambient temperatures exceed 70 °F for personnel wearing impermeable clothing. A Heath Stress Program is provided as Appendix C.

### 4.3.3 Noise

Noise is a potential hazard associated with the operation of heavy equipment, power tools, pumps, and generators. Operations that require the use of hearing protection include operation of heavy equipment, generators, jackhammers, chain saws, sheetpile drivers, dewatering equipment, and pressure washers. Site workers who will perform suspected high noise tasks and operations will be provided with earplugs. Workers not performing those tasks but working in close proximity to that equipment will also be required to wear hearing protection. If deemed necessary by the SM, the PESM will be consulted on the need for additional hearing protection and the need to monitor sound levels for Site activities.

### 4.3.4 Hand and Power Tools

To complete the various tasks for the proposed scope of work, personnel may be required to use hand and/or power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Work gloves, safety glasses, and hard hats will be worn by the operating personnel at all times when using hand and power tools, and ground fault interrupter (GFI)-equipped circuits will be used for all power tools.

### 4.3.5 Slips, Trips, and Falls

Working in and around the Site will pose slip, trip and fall hazards due to slippery surfaces that may be oil covered, or from surfaces that are wet from rain or ice. Excavation at the Site will cause uneven footing in the trenches and around the spoil piles. Care should be exercised when walking at the Site, especially when carrying equipment.

#### 4.3.6 Fire and Explosion

The use of cutting/grinding tools, which may spark in the vicinity of flammable building materials, or use of gasoline- or diesel-powered instruments could present the possibility of encountering fire and explosion hazards. Care should be exercised and fire extinguishers available during any work that presents a fire or explosion hazard.

#### 4.3.7 Manual Lifting

Manual lifting of heavy objects, such as sections of pipe or blower supplies, may be required. Failure to follow proper lifting technique can result in back injuries and strains. Site workers will be instructed to use power equipment to lift heavy loads whenever possible and to evaluate loads before trying to lift them (i.e., they should be able to easily tip the load and then return it to its original position). Heavy loads should be carried with a buddy and the following proper lifting techniques will be stressed: 1) make sure footing is solid, 2) make back straight with no curving or slouching, 3) center body over feet, 4) grasp the object firmly and as close to your body as possible, 5) lift with legs, and 6) turn with your feet, don't twist. Back injuries are a serious concern as they are the most

common workplace injury, often resulting in lost or restricted work time, and long treatment and recovery periods.

### 4.3.8 Utilities (Electrocution and Fire Hazards)

Underground utilities at the Site pose fire, explosion, and electrocution hazards. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death. Underground utilities, facilities, equipment, and structures will be located prior to the start of any intrusive activities. The Underground Utilities Call Center will be notified a minimum of three days before any subsurface disturbance. Care shall be exercised to avoid damage to utilities beneath the surface slab. As-builts will be consulted and a geophysical survey shall be completed, if needed.

### 4.4 Task Hazard Analysis

The scope of work described in Section 1.2 will be accomplished with the following tasks:

- 1. Mobilization/Demobilization: mobilize equipment and establish Site security, work zones, and staging areas.
- 2. Site Preparation: locate utilities, construct decontamination pad, and construct negative pressure environmental enclosure around excavation area, if required.
- 3. Sampling: use of appropriate PPE (e.g., nitrile gloves, safety glasses, ear plugs, hard hats).
- 4. Soil/Fill Excavation and Loading: in the event soil/fill removal is necessary, remove floor slab in designated area, excavate material and segregate dissimilar materials, load dump trucks or drums, decontaminate heavy equipment, and backfill excavations.
- 5. Site Restoration Activities: restore flooring in excavation area and any damaged adjacent floors/walls to original condition.

All of these tasks include the potential for chemical and physical hazards, and care should be taken within the work zone to avoid these hazards, as described above. There is a higher potential for chemical hazards to occur during activities that involve the removal and handling of contaminated material; however, exposure to vapors may occur to a lesser degree as soon as the top concrete slab is removed. All tasks should be conducted using the appropriate PPE for the associated exposure, as described in Section 6.0.

# 5.0 PROCESS SAFETY MANAGEMENT

Process safety management is a systematic way of identifying the potential health and safety hazards associated with major phases of work on a project, and the methods to avoid, control, and mitigate those hazards. Process safety management guidelines will be developed for all activities as necessary, prior to start-up. Process safety management will be used to train work crews in proper safety procedures during phase preparatory meetings.
### 6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The PPE required for various remediation tasks is based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER), Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear." All on-site personnel shall wear, at a minimum, Level D PPE. The protection will be based on the air monitoring described in Section 7.0. Table 2 lists the required PPE for the anticipated remediation tasks:

Level of Protection	Work Conditions		
Level D (x) Steel Toe Boots (x) Hard Hat (as needed) (x) Work Gloves (as needed) (x) Reflective Vest (as needed)	<ul> <li>(x) Safety Glasses or Face Shield</li> <li>(x) Ear Plugs (as needed)</li> <li>(x) Latex or nitrile Gloves (as needed)</li> </ul>	• All activities except those noted under Levels D modified and C	
Level D – Modified ( <i>in addition to Level D</i> ) (x) Nitrile Gloves (x) Overboots	<ul><li>(x) Tyvek Coveralls (as needed) -or-</li><li>(x) Saranex/Polyethylene-coated</li><li>Tyvek Coveralls (as needed)</li></ul>	• Activities with potential for contact with grossly contaminated material	
Level C – (in addition to Level D – Modified) (x) Half-Face Respirator () Full Face Respirator () Full-Face PAPR	<ul> <li>( ) Particulate Cartridge (P100)</li> <li>( ) Organic Cartridge</li> <li>(x) Dual Organic/Particulate Cartridge</li> </ul>	<ul> <li>If PID &gt; 10 ppm and/or</li> <li>If PM<sub>10</sub> &gt; 5.0 mg/m<sup>3</sup></li> </ul>	
Level C - Modified (in addition to Level D – Modified) () Half-Face Respirator (x) Full Face Respirator () Full-Face PAPR	<ul> <li>( ) Particulate Cartridge (P100)</li> <li>( ) Organic Cartridge</li> <li>(x) Dual Organic/Particulate Cartridge</li> </ul>	<ul> <li>If PID &gt;50 ppm; or</li> <li>Eye irritation occurs</li> </ul>	
Note: Vapor (PID) and particulate (PM <sub>10</sub> ) measurements are work zone action levels sustained for 15 minutes or greater.			

Table 2
<b>Personal Protection Equipment (PPE) Selection</b>

The PPE specified in Table 2 reflects the hazard analysis presented in Section 4.0 and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PESM and SM are considered competent persons. The signatures in this HASP constitute certification of the hazard assessment. For any activities not covered by Table 2, the SM will conduct the hazard assessment and select the appropriate required PPE in consultation with the PESM.

#### 6.1 **OSHA Requirements for PPE**

All PPE used must meet the OSHA standards presented in Table 3.

Table 3		
<b>PPE OSHA Standards</b>		

Type of Protection	Regulation	Source	
Eye and Face	29 CFR 1910.133	ANSI Z87.1 1968	
Respiratory	29 CFR 1910.134	ANSI Z88.1 1980	
Head	29 CFR 1910.135	ANSI Z89.1 1969	
Foot	29 CFR 1910.136	ANSI Z41.1 1967	
Note: ANSI - American National Standards Institute			

### 7.0 AIR MONITORING

Environmental health and safety monitoring will be performed during all soil disturbance activities in accordance with the Community Air Monitoring Plan (CAMP), which is also included in Appendix G of the SMP.

### 8.0 ZONES, PROTECTION, AND COMMUNICATION

#### 8.1 Site Control

Site zones are intended to control the potential spread of contamination and to assure that only authorized individuals are permitted into potentially hazardous areas. A three-zone approach will be utilized and will include: an Exclusion Zone (EZ), a Contamination Reduction Zone (CRZ), and a Support Zone (SZ). These zones will be established prior to beginning work for each task requiring such delineation (i.e., intrusive work beneath the Site cover or handling of contaminated materials). For larger scale subgrade work, the work zones will be sketched out and maps delineating the various work zones will be available at the Site and used during initial Site-specific training.

All work will be conducted under the requirements of 29 CFR 1910.120, and any personnel working in an area where the potential for exposure to Site contaminants exists will only be allowed access after proper training and medical documentation is provided to the SM. These records will be maintained by the SM and copies should be provided to the SM prior to mobilization for project activities.

The following will be used for guidance in revising these preliminary zone designations, if necessary:

- The SZ is an uncontaminated area that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.
- The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides an area for decontamination of personnel and portable handheld equipment, tools, and heavy equipment. A personnel decontamination area will be prepared at each exclusion zone. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.
- An EZ includes any area that may involve exposure to Site contaminants and hazardous materials and/or conditions. These zones will be clearly delineated by cones, tape, or other means. The SM may establish more than one EZ where different levels of protection may be employed or different hazards exist. The size of the EZ shall be determined by the Site SM, allowing adequate space for the activity to be completed by field members, and for emergency equipment to be staged.

#### 8.2 Contamination Control

#### 8.2.1 Personnel Decontamination Station

Personnel hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure.

#### 8.2.2 Minimization of Contact with Contaminants

During completion of all Site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during Site activities. All personnel should minimize physical contact with contamination to ultimately minimize the degree of decontamination required and the generation of waste materials from Site operations. Field procedures will be developed to control over spray and runoff and to ensure that unprotected personnel working nearby are not affected.

#### 8.2.3 **Personnel Decontamination Sequence**

Consideration will be given to prevailing wind directions so that the decontamination line, the SZ, and the CRZ exit are upwind from the EZ and the first station of the decontamination line. Decontamination will be performed by removing all PPE used in the EZ and placing it in drums/trash cans within the CRZ. Baby wipes will be available for washing hands and face after PPE removal. In addition, brushes will be available for removing soil/fill from boots.

#### 8.2.4 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination and wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the injured person can be moved, he/she will be moved to the EZ boundary and decontaminated by Site personnel, as previously described, before emergency responders handle the victim. If the person cannot be moved because of the extent of the injury (a back or neck injury), provisions shall be made to ensure that emergency response personnel will be able to respond to the victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exists, such as with an open excavation, this area will be covered with poly sheeting to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition and potential contaminants, and provided with all pertinent chemical data.

#### 8.2.5 Heavy Equipment Decontamination

Decontamination of chemically contaminated heavy equipment will be accomplished using high-pressure steam or dry decontamination with brushes and shovels. Decontamination shall take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Vehicles or equipment brought into an EZ will be treated as contaminated, and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be collected, stored, and disposed of in accordance with federal, state, and local regulations. Personnel performing these tasks will wear the proper PPE, as described in Table 2.

#### 8.3 Communications

The following communications equipment shall be specified as appropriate:

- Telephones A cellular telephone will be located in the SZ for communication with emergency support services/facilities and the home office. Personnel in the EZ can carry cellular telephones for communication as well if Level D PPE has been determined to be appropriate.
- Hand Signals Hand signals shall be used by field teams along with the buddy system. They shall be known by the entire field team before operations commence and their use covered during Site-specific training. Typical hand signals are described in Table 4.

Table 4 Hand Signals

Signal	Meaning
Hand gripping throat	Out of air, can't breathe
Grip on a partner's wrist or placement of both hands around a partner's waist	Leave area immediately/no debate
Hands on top of head	Need assistance
Thumbs up	Okay/I'm all right/I understand
Thumbs down	No/negative

### 9.0 MEDICAL SURVEILLANCE PROCEDURES

All personnel performing field work where potential exposure to contaminants exists at the Site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120(f) and, where applicable, expanded health standards.

#### 9.1 Medical Surveillance Requirements

A physician's medical release for work will be confirmed by the SM before a worker can enter the EZ. The medical release shall consider the type of work to be performed and the required PPE. The examination will be conducted annually at a minimum. Additional medical testing may be required by the PESM in consultation with the SM if an over-exposure or accident occurs, if an employee exhibits symptoms of exposure, or if other Site conditions warrant further medical surveillance.

### **10.0 SAFETY CONSIDERATIONS**

#### **10.1** Excavation and Trenching

The safety requirements for each excavation must be determined by a competent person who is capable of identifying existing and predictable hazards and work conditions that are unsanitary, hazardous, or dangerous to employees. The competent person must also have the authorization to take prompt corrective measures to eliminate unsatisfactory conditions.

The following are general requirements for work activities in and around excavations:

- Prior to initiation of any excavation activity, the location of underground utilities, obstructions, etc. will be determined. The New York State One-Call Center will be contacted by the excavation subcontractor a minimum of 72 hours prior to excavation activities.
- All excavations will be inspected daily and after each period of rain by the competent person prior to commencement of work activities. Evidence of cave-ins, slides, sloughing, or surface cracks or excavations will be cause for work to cease until necessary precautions are taken to safeguard employees.
- Excavated and other materials or equipment that could fall or roll into the excavation shall be placed at least 5 feet from the edge of the excavation.
- Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with CFR 1926.652 (b) or (c), except when excavations are less than 5 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in or excavation is made entirely in stable rock.
- Ladders will be positioned no further than 25 feet from any individual working in the trench.

### **11.0 DISPOSAL PROCEDURES**

All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials (e.g., clothing, gloves, etc.) will be bagged or drummed as necessary, labeled, and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal. The waste management procedures will be conducted in accordance with applicable local, state, and federal regulations.

### 12.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly, and require an immediate response; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on-site, record keeping, and emergency Site evacuation procedures.

#### 12.1 Responsibilities

#### 12.1.1 Project Environmental and Safety Manager (PESM)

The PESM is responsible for overseeing and approving the Emergency Response/Contingency Plan, and performing audits to determine that the plan is in effect and that all pre-emergency requirements are met. The PESM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents.

#### 12.1.2 Site Manager (SM)

The SM is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The SM is required to immediately notify the PM and PESM of any fatalities or catastrophes (three or more workers injured and hospitalized) so that the PESM can notify OSHA within the required time frame. The PESM will be notified of all OSHA recordable injuries, fires, spills, releases, or equipment damage in excess of \$500 within 24 hours. The SM also serves as the Alternate Emergency Coordinator.

#### **12.1.3 Emergency Coordinator**

In the event of an emergency, the Emergency Coordinator shall make contact with local emergency response personnel. In these contacts, the Emergency Coordinator will inform response personnel about the nature of work on the Site, the type of contaminants and associated health or safety effects, and the nature of the emergency, particularly if it is related to exposure to contaminants.

The Emergency Coordinator shall review this plan and verify emergency phone numbers and identify hospital routes prior to beginning work on-site. The Emergency Coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the Emergency Response/Contingency Plan whenever conditions at the Site warrant such action.

#### **12.1.4** Site Personnel

Site personnel are responsible for knowing the Emergency Response/Contingency Plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a Site emergency.

#### **12.2** Communications

A variety of communication systems may be utilized during emergency situations. These are discussed in the following sections.

The primary form of communication during an emergency between field groups in the EZ and the Emergency Coordinator will be verbal communications. During an emergency situation, lines of

communication will be kept clear to the extent possible so that instructions can be received by all field teams.

#### **12.2.1** Telephone Communications

A cellular telephone will be available on-site.

#### 12.2.2 Hand Signals

Hand signals will be employed by downrange field teams where necessary for communication during emergency situations. Hand signals are presented in Table 4 in Section 8.3.

#### **12.3 Pre-Emergency Planning**

Before the field activities begin, the local emergency response personnel may be notified by the Site owner's representative or contractor of the schedule for field activities and about the materials that are thought to exist on the Site so that they will be able to respond quickly and effectively in the event of a fire, explosion, or other emergency.

To be able to deal with any emergency that might occur during remedial activities at the Site, emergency telephone numbers will be readily available in the SM vehicle or the Site office. These telephone numbers are presented Section 12.16. The emergency phone numbers listed are preliminary and will be updated as needed prior to the start of work. Immediately prior to mobilization, the SM shall verify all numbers and document any changes in the Site logbook. Hospital route maps will also be readily available in the SM vehicle and/or Site office.

#### **12.4 Emergency Medical Treatment**

The procedures and rules in this HASP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the SM immediately. First aid equipment such as a first aid kit and disposable eye washes will be available on-site.

During the Site safety briefing, project personnel will be informed of the location of the first aid station(s) that have been set up. In the case of a medical emergency, the SM will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious, i.e., the person can be moved without expert emergency medical personnel, he/she should be driven to a hospital by on-site personnel. Directions to the hospital with a hospital route map are provided in Section 12.15/Table 6. Unless they are in immediate danger, severely injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. Any first aid instructions that can be obtained from doctors or paramedics before an emergency-response squad arrives at the Site or before the injured person can be transported to the hospital will be followed closely.

#### 12.5 Emergency Site Evacuation Routes and Procedures

In the event of a Site emergency that would require the evacuation of personnel, the Emergency Coordinator will immediately contact the Site owner or owner's representative (this person may or may not be on-site). All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial Site safety meeting. If an emergency occurs at the work area, including but not limited to fire, explosion, or significant release of toxic gas into the atmosphere, immediate evacuation of all personnel is necessary due to an immediate or impending danger. The following evacuation procedures will be used:

- The SM will initiate evacuation procedures by signaling to leave the Site or EZ. The signal for Site evacuation will consist of three long blasts on an air horn.
- All heavy equipment will be shut down and all personnel will evacuate the work areas and assemble at a pre-determined meeting location. The designated meeting location for the Site will be at the parking lot along Flushing Avenue.
- All personnel suspected to be in or near the work area should be accounted for and the whereabouts of missing persons determined immediately.
- The SM will then give further instruction.

If any task covered under this HASP has the potential for significant hazards, evacuation drills will be performed as deemed necessary by the SM and PESM.

#### **12.6** Fire Prevention and Protection

In the event of a fire or explosion, the work area will be evacuated immediately and the EC will notify the local fire and police departments. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials;
- Storage of flammable liquids and gases in nonn-flammable storage cabinets when not in use, away from oxidizers;
- Storage of oxygen at least 25 feet away from acetylene cylinders when not in use. Oxygen and acetylene may not be stored on welding carts;
- No smoking in the EZ or any work area;
- No hot work without a properly executed hot work permit;
- Shutting off engines to refuel;
- Grounding and bonding metal containers during transfer of flammable liquids;
- Use of UL approved non-flammable storage cans;
- Fire extinguishers rated at least 10 pounds Class A, B, and C located on all heavy equipment, in all trailers, and near all hot work activities; and
- Monthly inspection of all fire extinguishers.

The contractor is responsible for the maintenance of fire prevention and/or control equipment and the control of fuel source hazards.

#### **12.7** Overt Chemical Exposure

The following are standard procedures to treat chemical exposures. Other, specific procedures detailed on the ATSDR Fact Sheets will be followed as necessary. If first aid or emergency medical treatment is necessary, the Emergency Coordinator will contact the appropriate emergency facilities. All chemical exposure incidents must be reported in writing to the PESM. If a member of the field crew demonstrates symptoms of chemical exposure, another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the SM (via voice and hand signals) of the chemical exposure.

The SM should contact the appropriate emergency response agency. The procedures outlined in Table 5 should be followed.

Exposure Pathway	Treatment Procedure	
Skin and Eye Contact	Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, and then provide appropriate medical attention. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids, or hydrogen peroxide occurs.	
Inhalation	Move to fresh air. Decontaminate and transport to hospital or local medical provider.	
Ingestion	Decontaminate and transport to emergency medical facility.	
Puncture Wound or Laceration	Decontaminate and transport to emergency medical facility.	

Table 5Chemical Exposure Treatment Procedures

#### 12.8 Personal Injury

In case of personal injury at the Site, the following procedures should be followed:

- Another team member (buddy) should signal the SM that an injury has occurred.
- A field team member trained in first aid can administer treatment to an injured worker.
- If deemed necessary, the victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- The SM or field safety officer (FSO) should make certain that an Incident Report Form (provided as Appendix D) is completed. This form is to be submitted to the PESM. Follow-up action should be taken to correct the situation that caused the accident.
- Any incident (near miss, property damage, first aid, medical treatment, etc.) must be reported.
- A first aid kit and an eye wash will be kept on-site during the field activities.

#### **12.9** Decontamination During Medical Emergencies

If emergency life-saving first aid and/or medical treatment are required, normal decontamination procedures may need to be abbreviated or postponed. The SM or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments on the victim can be removed if this does not cause delays, interfere with treatment, or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed on-site, a plastic barrier between the injured individual and clean surfaces should be used to help prevent contamination of the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. No attempt will be made to wash or rinse the victim if his/her injuries are life threatening, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material which could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed.

#### 12.10 Accident/Incident Reporting

Written confirmation of verbal reports of injuries or other emergencies are to be submitted to the PESM within 24 hours. The Incident Report Form is provided as Appendix D.

In addition to the incident reporting procedures and actions described in this HASP, the SM will coordinate with the owner's representative for reporting and notification for all environmental, safety, and other incidents.

If necessary, a Site safety briefing will be held to discuss accidents/incidents and any findings from the investigation of the incident. This HASP will be modified if deemed necessary by the PESM.

#### **12.11** Spill Control and Response

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the ATSDR Fact Sheets will be consulted to assist in determining the best means of containment and cleanup. For small spills, absorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be diluted or neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed. An EZ of 50-100 feet around the spill area should be established depending on the size and type of the spill.

The following steps should be taken by the Emergency Coordinator:

- 1. Determine the nature, identity, and amounts of major spill components;
- 2. Make sure all unnecessary persons are removed from the spill area;
- 3. Notify appropriate response teams and authorities;
- 4. Use proper PPE in consultation with the SM;
- 5. If a flammable liquid, gas, or vapor is involved, remove all ignition sources and use nonsparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, air operated pumps, etc.);
- 6. If possible, try to stop the leak with appropriate material;
- 7. Remove all surrounding materials that can react or compound with the spill; and
- 8. Notify the Site owner and determine who will report the spill to the NYSDEC Spills Hotline, as applicable.

#### **12.12** Emergency Equipment

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit;
- Portable eye washes;
- Fire extinguishers (one per vehicle and heavy equipment); and
- Absorbent material.

#### 12.13 Postings

The following information shall be posted or be readily visible and available at conspicuous locations throughout the Site:

- Emergency telephone numbers; and •
- Hospital Route Map (Figure 2). •

#### 12.14 Restoration and Salvage

After an emergency, prompt restoration of utilities, fire protection equipment, medical supplies, and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed are:

- Refilling fire extinguishers; •
- Refilling medical supplies; •
- Recharging eyewashes and/or showers; •
- Replenishing spill control supplies; and •
- Replacing used air horns. •

#### **12.15** Hospital Directions

The address and directions to the nearest hospital to the Site are provided in Table 6:

4. Turn right onto Stanhope Street. 5. Destination will be on the right.

<b>Hospital Directions</b>		
Hospital Name:	Wyckoff Heights Medical Center	
Phone Number:	718-963-7391	
Address:	337-381 Stanhope St, Brooklyn, NY 11237	
	1. Head south out of the Site and make a right on to Woodward Avenue	
	towards Flushing Avenue.	
Divertioner	2. Turn left onto Flushing Avenue.	
Directions:	3. Turn left onto St. Nicolas Avenue.	

Table 6

A map showing the Site evacuation meeting point and driving route to the hospital is provided as Figure 2.

#### 12.16 Emergency Contacts

Table 8 **Emergency Contacts** 

Company	Individual Name	Title	<b>Contact Number</b>
AKRF	Michelle Lapin, P.E.	Remedial Engineer	(646) 388-9520
			(office)
	Deborah Shapiro,	Project Director	(914) 922-2356
	QEP		(office)
	Patrick Diggins	Project Manager	(914) 922-2784
			(office)

Company	Individual Name	Title	Contact Number
1906 Flushing LLC	Risa Weinstock	Client	(646) 996-7568
		Representative	(office)
Ambulance, Fire			
Department & Police	-	-	911
Department			
NYSDEC Spill Hotline	-	-	(800) 457-7362

Table 8Emergency Contacts

The emergency contact list will be updated as needed.

### 13.0 TRAINING

#### 13.1 General Health and Safety Training

In accordance with 29 CFR 1910.120, hazardous waste Site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste Site operations, unless otherwise noted in the above reference. At a minimum, the training will have consisted of instruction in the topics outlined in the standard. Personnel who have not met the requirements for initial training shall not be allowed to work in any Site activities during which they may be exposed to hazards (chemical or physical). Proof of training shall be submitted to the SM prior to the start of field activities. Other personnel involved in ancillary or support activities, including transportation of material for disposal, shall have the proper training as required by federal, state, and local regulations.

#### 13.2 Annual Eight-Hour Refresher Training

Annual eight-hour refresher training will be required of hazardous waste Site field personnel working in the work zone to maintain their qualifications for fieldwork. The training will cover a review of 29 CFR 1910.120 requirements and related company programs and procedures.

#### **13.3** Supervisor Training

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40-hour training.

#### **13.4** Site-Specific Training

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the Site operations. The training will cover Site and facility layout, hazards and emergency services, and all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. The training should include the following topics:

- General requirements of this HASP;
- Review of the scope of work;
- Names of personnel responsible for Site safety and health;
- Potential hazards and acute effects of compounds present at the Site;
- Air monitoring procedures;
- Proper use of PPE;
- Safe use of ECs and equipment on the Site;
- Decontamination procedures; and
- Work practices by which the employee can minimize risk from hazards. This may include a specific review of heavy equipment safety, safety during inclement weather, changes in the escape rendezvous point, Site security measures, or other Site-specific issues that need to be addressed before work begins.

Personnel that have not received Site-specific training will not be allowed in the work zone.

#### 13.5 On-Site Safety Briefings

Project personnel working in designated work zones on-site will be given health and safety briefings periodically by the SM to assist in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the Site's environmental conditions, and periodic reinforcement of previously discussed topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety inspections. The meetings will also be an opportunity to periodically update the crews on monitoring results.

### 14.0 LOGS, REPORTS, AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping.

#### 14.1 Medical and Training Records

Copies or verification of training (40-hour, 8-hour, supervisor, and Site-specific training) and medical clearance for hazardous waste Site work and respirator use will be maintained by the SM.

#### 14.2 On-Site Log

A log of personnel on-site each day will be kept by the SM in a field logbook.

#### 14.3 Exposure Records

The SM will periodically notify the PESM of exposure monitoring results that require workers to upgrade to Level C. All personal monitoring results, laboratory reports, calculations, and air sampling data sheets will be maintained by the SM during Site work.

#### 14.4 Accident/Incident Reports

Incident reporting and investigation during Site work will be completed using an Incident Report Form, provided as Appendix D.

# 14.5 Hazard Communication Program/Agency for Toxic Substances and Disease Registry (ATSDR)

ATSDR Fact Sheets will be obtained for applicable substances and included in the Site hazard communication file. The hazard communication program will be maintained on-site in accordance with 29 CFR 1910.1200.

#### 14.6 Work Permits

All work permits, including lockout/tagout, sidewalk permits, and debris container permits (if necessary), will be maintained in the project files. Copies of the work permits shall also be provided to the SM and the Site owner's representative.

### **15.0 FIELD PERSONNEL REVIEW**

This form serves as documentation that field personnel have read, been informed of, and understand the provisions of this HASP for the Site at 151 Woodward Avenue, Queens, New York. It will be maintained on-site by the SM as a project record. Each field team member shall sign this section after training in the contents of this HASP has been completed. Site workers must sign this form after Site-specific training is completed and before being permitted to work on-site.

#### AFFIDAVIT

I have read, or have been informed of, this Health and Safety Plan and understand the information presented. I have also completed Site-specific training for the work detailed in the project specifications. I will comply with the provisions contained therein.

Name (Print and Sign) and Company	Date

FIGURES





APPENDIX A ATSDR FACT SHEETS

# Polychlorinated Biphenyls - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

### What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

# What happens to PCBs when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.

• PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

### How might I be exposed to PCBs?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

### How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences

# **Polychlorinated Biphenyls**

several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

# How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. PCBs have been classified as probably carcinogenic, and carcinogenic to humans (group 1) by the Environmental Protection Agency (EPA) and International Agency for Research on Cancer (IARC), respectively.

## How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

# How can families reduce the risks of exposure to PCBs?

- You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.
- Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.

- Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.
- If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

### Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

# Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

## Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

# Phenol - ToxFAQs™

# CAS # 108-95-2

This fact sheet answers the most frequently asked health questions (FAQs) about phenol. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Phenol is both a manufactured chemical and a natural substance. Phenol is used as a disinfectant and is found in a number of consumer products. Skin exposure to high amounts can produce skin burns, liver damage, dark urine, irregular heart beat, and even death. Ingestion of concentrated phenol can produce internal burns. Phenol has been found in at least 595 of the 1,678 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

### What is phenol?

Phenol is both a manufactured chemical and a natural substance. It is a colorless-to-white solid when pure. The commercial product is a liquid. Phenol has a distinct odor that is sickeningly sweet and tarry.

You can taste and smell phenol at levels lower than those that are associated with harmful effects. Phenol evaporates more slowly than water, and a moderate amount can form a solution with water.

Phenol is used primarily in the production of phenolic resins and in the manufacture of nylon and other synthetic fibers. It is also used in slimicides (chemicals that kill bacteria and fungi in slimes), as a disinfectant and antiseptic, and in medicinal preparations such as mouthwash and sore throat lozenges.

# What happens to phenol when it enters the environment?

- Following small, single releases, phenol is rapidly removed from the air (generally, half is removed in less than a day).
- Phenol generally remains in the soil only about 2 to 5 days.
- Phenol can remain in water for a week or more.
- Larger or repeated releases of phenol can remain in the air, water, and soil for much longer periods of time.
- Phenol does not build up in fish, other animals, or plants.

### How might I be exposed to phenol?

- You may be exposed to phenol if you live near landfills or hazardous waste sites that contain phenol or near facilities manufacturing phenol.
- You may be exposed to very low levels in your home because it is found in a number of consumer products, including mouthwashes and throat lozenges.
- You may be exposed to phenol if you undergo "chemical peels" to remove skin lesions with phenol-containing products or are treated for chronic pain or spasticity with injections of phenol.
- Low levels of phenol are found in some foods, including smoked summer sausage, fried chicken, mountain cheese, and some species of fish.
- Smoking or inhaling second hand smoke will expose you to phenol.
- Low levels of phenol can be present in air and drinking water.

### How can phenol affect my health?

Most of the phenol that you may inhale or ingest will enter the bloodstream; less will enter if there is contact with the skin.

Short-term exposure to phenol in the air can cause respiratory irritation, headaches, and burning eyes. People who had skin exposure to high amounts of phenol had skin burns, liver damage, dark urine,



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences

# Phenol

# CAS # 108-95-2

irregular heart beat, and some died. Ingestion of high concentrations of phenol has resulted in internal burns and death.

In animals, breathing air with high levels of phenol resulted in irritation of the lungs. Repeated exposures induced muscle tremors and loss of coordination. Exposure to high concentrations of phenol in the air for several weeks caused paralysis and severe injury to the heart, liver, kidneys, and lungs, and in some cases, death. Some animals that drank water with very high concentrations of phenol suffered muscle tremors and loss of coordination.

Phenol can have beneficial effects when used medically as an antiseptic or anesthetic.

### How likely is phenol to cause cancer?

The International Agency for Research on Cancer (IARC) and the EPA have determined that phenol is not classifiable as to its carcinogenicity to humans.

#### How can phenol affect children?

Vomiting and lethargy were the most frequent signs of toxicity observed in children who accidentally ingested phenol and were treated at a poison control center. We do not know whether children would be more sensitive than adults to the effects of phenol.

Phenol has caused minor birth defects and low birth weight in animals generally at exposure levels that also were toxic to the pregnant mothers.

# How can families reduce the risks of exposure to phenol?

• Avoiding environmental tobacco smoke, which contains phenol, will reduce phenol exposures.

 Always store household products and over-thecounter medications that contain phenol in their original labeled containers out of the reach of children.

# Is there a medical test to determine whether I've been exposed to phenol?

Phenol can be measured in blood and urine. A higherthan-normal concentration of phenol in the urine may suggest recent exposure to phenol or to substances that are converted to phenol in the body.

The detection of phenol and/or its metabolites in your urine cannot be used to predict the kind of health effects that might develop from that exposure.

# Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to phenol in drinking water at concentrations of 6 mg/L for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 2 mg/L phenol in drinking water is not expected to cause any adverse effects.

The Occupational Safety and Health Administration (OSHA) has set a limit of 5 parts per million (ppm) of phenol in air to protect workers during 8-hour work shifts.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2008. Toxicological Profile for Phenol. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

#### Phone: 1-800-232-4636.

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

### U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, Public Health Service Agency for Toxic Substances and Disease Registry

### **Division of Toxicology ToxFAQs<sup>TM</sup>**

This fact sheet answers the most frequently asked health questions (FAQs) about selenium. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other <u>chemicals are present</u>.

HIGHLIGHTS: People may be exposed to low levels of selenium daily through food and water. Selenium is a trace mineral needed in small amounts for good health, but exposure to much higher levels can result in neurological effects and brittle hair and deformed nails. Occupational inhalation exposure to selenium vapors may cause dizziness, fatigue, irritation of mucous membranes, and respiratory effects. This substance has been found in at least 508 of the 1,636 National Priorities List sites identified by the Environmental Protection Agency (EPA).

#### What is selenium?

Selenium is a naturally occurring mineral element that is distributed widely in nature in most rocks and soils. In its pure form, it exists as metallic gray to black hexagonal crystals, but in nature it is usually combined with sulfide or with silver, copper, lead, and nickel minerals. Most processed selenium is used in the electronics industry, but it is also used: as a nutritional supplement; in the glass industry; as a component of pigments in plastics, paints, enamels, inks, and rubber; in the preparation of pharmaceuticals; as a nutritional feed additive for poultry and livestock; in pesticide formulations; in rubber production; as an ingredient in antidandruff shampoos; and as a constituent of fungicides. Radioactive selenium is used in diagnostic medicine.

# What happens to selenium when it enters the environment?

Selenium occurs naturally in the environment and can be released by both natural and manufacturing processes.
Selenium dust can enter the air from burning coal and oil. This selenium dust will eventually settle over the land and water.

□ It also enters water from rocks and soil, and from agricultural and industrial waste. Some selenium compounds will dissolve in water, and some will settle to the bottom as particles.

□ Insoluble forms of selenium will remain in soil, but soluble forms are very mobile and may enter surface water from soils.

 $\hfill\square$  Selenium may accumulate up the food chain.

### How might I be exposed to selenium?

 $\Box$  The general population is exposed to very low levels of selenium in air, food, and water. The majority of the daily intake comes from food.

□ People working in or living near industries where selenium is produced, processed, or converted into commercial products may be exposed to higher levels of selenium in the air.

□ People living in the vicinity of hazardous waste sites or coal burning plants may also be exposed to higher levels of selenium.

## How can selenium affect my health?

Selenium has both beneficial and harmful effects. Low doses of selenium are needed to maintain good health. However, exposure to high levels can cause adverse health effects. Short-term oral exposure to high concentrations of selenium may cause nausea, vomiting, and diarrhea. Chronic oral exposure to high concentrations of selenium compounds can produce a disease called selenosis. The major signs of selenosis are hair loss, nail brittleness, and neurological abnormalities (such as numbness and other odd sensations

### September 2003

**SELENIUM** 

CAS # 7782-49-2

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

# **SELENIUM** CAS # 7782-49-2

### ToxFAQs<sup>™</sup> Internet address is http://www.atsdr.cdc.gov/toxfaq.html

#### in the extremities).

Brief exposures to high levels of elemental selenium or selenium dioxide in air can result in respiratory tract irritation, bronchitis, difficulty breathing, and stomach pains. Longerterm exposure to either of these air-borne forms can cause respiratory irritation, bronchial spasms, and coughing. Levels of these forms of selenium that would be necessary to produce such effects are normally not seen outside of the workplace.

Animal studies have shown that very high amounts of selenium can affect sperm production and the female reproductive cycle. We do not know if similar effects would occur in humans.

#### How likely is selenium to cause cancer?

Studies of laboratory animals and people show that most selenium compounds probably do not cause cancer. In fact, studies in humans suggest that lower-than-normal selenium levels in the diet might increase the risk of cancer. The International Agency for Research on Cancer (IARC) has determined that selenium and selenium compounds are not classifiable as to their carcinogenicity to humans. The EPA has determined that one specific form of selenium, selenium sulfide, is a probable human carcinogen. Selenium sulfide is not present in foods and is a very different chemical from the organic and inorganic selenium compounds found in foods and in the environment.

#### How can selenium affect children?

It is likely that the health effects seen in children exposed to selenium will be similar to the effects seen in adults. However, one study found that children may be less susceptible to the health effects of selenium than adults. Selenium compounds have not been shown to cause birth defects in humans or in other mammals.

# How can families reduce the risk of exposure to selenium?

□ Certain dietary supplements and shampoos contain selenium; these should be used according to the

#### manufacturer's directions.

□ Children living near waste sites that contain selenium or coal burning plants should be encouraged to wash their hands before eating and to avoid putting their unwashed hands in their mouths.

# Is there a medical test to show whether I've been exposed to selenium?

Low levels of selenium are normally found in body tissues and urine. Blood and urine tests for selenium are most useful for people who have recently been exposed to high levels. Toenail clippings can be used to determine longerterm exposure. These tests are not usually available at your doctor's office, but your doctor can send the samples to a laboratory that can perform the tests. None of these tests, however, can predict whether you will experience any health effects.

# Has the federal government made recommendations to protect human health?

The EPA restricts the amount of selenium allowed in public water supplies to 50 parts total selenium per billion parts of water (50 ppb).

The Occupational Safety and Health Administration (OSHA) sets a limit of 0.2 mg selenium/m<sup>3</sup> of workroom air for an 8-hour work shift.

ATSDR and the EPA have determined that 5 micrograms of selenium per kilogram of body weight taken daily would not be expected to cause any adverse health effects over a lifetime of such intake.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2003. Toxicological Profile for Selenium (Update) Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Federal Recycling Program



### Division of Toxicology and Environmental Medicine ToxFAQs<sup>TM</sup>

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. Xylene has been found in at least 840 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

#### What is xylene?

There are three forms of xylene in which the methyl groups vary on the benzene ring: *meta*-xylene, *ortho*-xylene, and *para*-xylene (*m*-, *o*-, and *p*-xylene). These different forms are referred to as isomers.

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar. Chemical industries produce xylene from petroleum. It is one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

# What happens to xylene when it enters the environment?

 $\hfill\square$  Xylene evaporates quickly from the soil and surface water into the air.

□ In the air, it is broken down by sunlight into other less harmful chemicals in a couple of days.

It is broken down by microorganisms in soil and water.
 Only a small amount of it builds up in fish, shellfish, plants, and other animals living in xylene-contaminated water.

#### How might I be exposed to xylene?

□ Using a variety of consumer products including gasoline, paint varnish, shellac, rust preventatives, and cigarette smoke. Xylene can be absorbed through the respiratory tract and through the skin.

□ Ingesting xylene-contaminated food or water, although these levels are likely to be very low.

□ Working in a job that involves the use of xylene such as painters, paint industry workers, biomedical laboratory workers, automobile garage workers, metal workers, and furniture refinishers.

#### How can xylene affect my health?

No health effects have been noted at the background levels that people are exposed to on a daily basis.

High levels of exposure for short or long periods can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

# **XYLENE** CAS # 1330-20-7



#### August 2007

# **XYLENE** CAS # 1330-20-7

#### ToxFAQs<sup>TM</sup> Internet address is http://www.atsdr.cdc.gov/toxfaq.html

#### How likely is xylene to cause cancer?

Both the International Agency for Research on Cancer (IARC) and the EPA have found that there is insufficient information to determine whether or not xylene is carcinogenic.

#### How can xylene affect children?

The effects of xylene have not been studied in children, but it is likely that they would be similar to those seen in exposed adults. Although there is no direct evidence, children may be more sensitive to acute inhalation exposure than adults because their narrower airways would be more sensitive to swelling effects.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy

# How can families reduce the risks of exposure to xylene?

□ Exposure to xylene as solvents (in paints or gasoline) can be reduced if the products are used with adequate ventilation and if they are stored in tightly closed containers out of the reach of small children.

□ Sometimes older children sniff household chemicals in attempt to get high. Talk with your children about the dangers of sniffing xylene.

□ If products containing xylene are spilled on the skin, then the excess should be wiped off and the area cleaned with soap and water.

# Is there a medical test to determine whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office because they require special equipment.

# Has the federal government made recommendations to protect human health?

The EPA set a limit of 10 parts xylene per million parts drinking water (10 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 100 parts xylene per million parts of workplace air (100 ppm) for 8 hour shifts and 40 hour work weeks.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Xylene (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Federal Recycling Program



# Arsenic - ToxFAQs™

# CAS # 7440-38-2

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

#### What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

# What happens to arsenic when it enters the environment?

- Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching.
- Arsenic cannot be destroyed in the environment. It can only change its form.
- Rain and snow remove arsenic dust particles from the air.
- Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
- Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

### How might I be exposed to arsenic?

- Ingesting small amounts present in your food and water or breathing air containing arsenic.
- Breathing sawdust or burning smoke from wood treated with arsenic.
- Living in areas with unusually high natural levels of arsenic in rock.
- Working in a job that involves arsenic production or use, such as copper or lead smelting, wood treating, or pesticide application.

### How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences

# Arsenic

# CAS # 7440-38-2

compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys.

### How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

### How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

# How can families reduce the risks of exposure to arsenic?

- If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.
- If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.

• If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on your clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

# Is there a medical test to determine whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

# Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air (10  $\mu$ g/m<sup>3</sup>) for 8 hour shifts and 40 hour work weeks.

### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Health and Human Services. Public Health Service.

#### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



# BARIUM CAS # 7440-39-3

#### Division of Toxicology and Human Health Sciences ToxFAQs<sup>TM</sup>

#### June 2013

This fact sheet answers the most frequently asked health questions (FAQs) about barium and barium compounds. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because these substances may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to barium occurs mostly in the workplace or from drinking contaminated water. Ingesting drinking water containing levels of barium above the EPA drinking water guidelines for relatively short periods of time can cause gastrointestinal disturbances and muscle weakness. Ingesting high levels for a long time can damage the kidneys. Barium and barium compounds have been found in at least 798 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

#### What is barium?

Barium is a silvery-white metal which exists in nature only in ores containing mixtures of elements. It combines with other chemicals such as sulfur or carbon and oxygen to form barium compounds.

Barium compounds are used by the oil and gas industries to make drilling muds. Drilling muds make it easier to drill through rock by keeping the drill bit lubricated. They are also used to make paint, bricks, ceramics, glass, and rubber.

Barium sulfate is sometimes used by doctors to perform medical tests and to take x-rays of the gastrointestinal tract.

# What happens to barium when it enters the environment?

- □ Barium gets into the air during the mining, refining, and production of barium compounds, and from the burning of coal and oil.
- □ The length of time that barium will last in air, land, water, or sediments depends on the form of barium released.
- □ Barium compounds, such as barium sulfate and barium carbonate, which do not dissolve well in water, can last a long time in the environment.
- □ Barium compounds, such as barium chloride, barium nitrate, or barium hydroxide, that dissolve easily in water usually do not last in these forms for a long time in the environment. The barium in these compounds that is dissolved in water quickly combines with sulfate or carbonate that are naturally found in water and become

the longer lasting forms (barium sulfate and barium carbonate).

□ Fish and aquatic organisms can accumulate barium.

#### How might I be exposed to barium?

- □ Ingesting small amounts present in your food and water or breathing air containing very low levels of barium.
- □ Living in areas with unusually high natural levels of barium in the drinking water.
- □ Working in a job that involves barium production or use.
- □ Living or working near waste sites where barium has been disposed of.

#### How can barium affect my health?

The health effects of the different barium compounds depend on how well the compound dissolves in water or in the stomach contents. Barium compounds that do not dissolve well, such as barium sulfate, are not generally harmful.

Barium has been found to potentially cause gastrointestinal disturbances and muscular weakness when people are exposed to it at levels above the EPA drinking water standards for relatively short periods of time. Some people who eat or drink amounts of barium above background levels found in food and water for a short period may experience vomiting, abdominal cramps, diarrhea, difficulties in breathing, increased or decreased blood pressure, numbness around the face, and muscle weakness. Eating or drinking very large amounts of barium compounds that easily dissolve can cause changes in heart

# BARIUM CAS # 7440-39-3

# ToxFAQs<sup>TM</sup> Internet address is http://www.atsdr.cdc.gov/toxfaqs/index.asp

rhythm or paralysis and possibly death. Animals that drank barium over long periods had damage to the kidneys, decreases in body weight, and some died.

#### How likely is barium to cause cancer?

The Department of Health and Human Services (DHHS) and the International Agency for Research on Cancer (IARC) have not classified barium as to its carcinogenicity. The EPA has determined that barium is not likely to be carcinogenic to humans following ingestion and that there is insufficient information to determine whether it will be carcinogenic to humans following inhalation exposure.

#### How can barium affect children?

We do not know whether children will be more or less sensitive than adults to barium toxicity. A study in rats that swallowed barium found a decrease in newborn body weight; we do not know if a similar effect would be seen in humans.

# How can families reduce the risk of exposure to barium?

□ The greatest potential source of barium exposure is through food and drinking water. However, the amount of barium in foods and drinking water are typically too low to be of concern.

# Is there a medical test to determine whether I've been exposed to barium?

There is no routine medical test to determine whether you have been exposed to barium. Doctors can measure barium in body tissues and fluids, such as bones, blood, urine, and feces, using very complex instruments. These tests cannot be used to predict the extent of the exposure or potential health effects.

The geometric mean barium level measured in the U.S. general population aged 6 and older is reported by the Centers for Disease Control and Prevention (CDC) as 1.56  $\mu$ g/g creatinine (measured in urine).

# Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2.0 milligrams of barium per liter of drinking water (2.0 mg/L), which is the same as 2 ppm.

The Occupational Safety and Health Administration (OSHA) has set Permissible Exposure Limits (PELs) of 0.5 milligrams of soluble barium compounds per cubic meter of workplace air  $(0.5 \text{ mg/m}^3)$  for 8 hour shifts and 40 hour work weeks. The OSHA limits for barium sulfate dust are 15 mg/m<sup>3</sup> of total dust and 5 mg/m<sup>3</sup> for respirable fraction.

The National Institute for Occupational Safety and Health (NIOSH) has set Recommended Exposure Limits (RELs) of  $0.5 \text{ mg/m}^3$  for soluble barium compounds. The NIOSH has set RELs of  $10 \text{ mg/m}^3$  (total dust) for barium sulfate and  $5 \text{ mg/m}^3$  (respirable fraction).

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Barium and Compounds (*Update*). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

http://www.cdc.gov/exposurereport/pdf/FourthReport\_Upd atedTables\_Sep2012.pdf

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

**Federal Recycling Program** 



# Chromium - ToxFAQs<sup>™</sup>

# CAS # 7440-47-3

This fact sheet answers the most frequently asked health questions (FAQs) about chromium. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Exposure to chromium occurs from ingesting contaminated food or drinking water or breathing contaminated workplace air. Chromium(VI) at high levels can damage the nose and cause cancer. Ingesting high levels of chromium(VI) may result in anemia or damage to the stomach or intestines. Chromium(III) is an essential nutrient. Chromium has been found in at least 1,127 of the 1,669 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

### What is chromium?

Chromium is a naturally occurring element found in rocks, animals, plants, and soil. It can exist in several different forms. Depending on the form it takes, it can be a liquid, solid, or gas. The most common forms are chromium(0), chromium(III), and chromium(VI). No taste or odor is associated with chromium compounds.

The metal chromium, which is the chromium(0) form, is used for making steel. Chromium(VI) and chromium(III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

# What happens to chromium when it enters the environment?

- Chromium can be found in air, soil, and water after release from the manufacture, use, and disposal of chromium-based products, and during the manufacturing process.
- Chromium does not usually remain in the atmosphere, but is deposited into the soil and water.
- Chromium can easily change from one form to another in water and soil, depending on the conditions present.
- Fish do not accumulate much chromium in their bodies from water.

#### How might I be exposed to chromium?

- Eating food containing chromium(III).
- Breathing contaminated workplace air or skin contact during use in the workplace.

- Drinking contaminated well water.
- Living near uncontrolled hazardous waste sites containing chromium or industries that use chromium.

### How can chromium affect my health?

Chromium(III) is an essential nutrient that helps the body use sugar, protein, and fat.

Breathing high levels of chromium(VI) can cause irritation to the lining of the nose, nose ulcers, runny nose, and breathing problems, such as asthma, cough, shortness of breath, or wheezing. The concentrations of chromium in air that can cause these effects may be different for different types of chromium compounds, with effects occurring at much lower concentrations for chromium(VI) compared to chromium(III).

The main health problems seen in animals following ingestion of chromium(VI) compounds are irritation and ulcers in the stomach and small intestine and anemia. Chromium(III) compounds are much less toxic and do not appear to cause these problems.

Sperm damage and damage to the male reproductive system have also been seen in laboratory animals exposed to chromium(VI).

Skin contact with certain chromium(VI) compounds can cause skin ulcers. Some people are extremely sensitive tochromium(VI) or chromium(III). Allergic reactions consisting of severe redness and swelling of the skin have been noted.



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences
## Chromium

#### CAS # 7440-47-3

#### How likely is chromium to cause cancer?

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have determined that chromium(VI) compounds are known human carcinogens.

In workers, inhalation of chromium(VI) has been shown to cause lung cancer. Chromium(VI) also causes lung cancer in animals. An increase in stomach tumors was observed in humans and animals exposed to chromium(VI) in drinking water.

#### How can chromium affect children?

It is likely that health effects seen in children exposed to high amounts of chromium will be similar to the effects seen in adults.

We do not know if exposure to chromium will result in birth defects or other developmental effects in people. Some developmental effects have been observed in animals exposed to chromium(VI).

## How can families reduce the risk of exposure to chromium?

- Children should avoid playing in soils near uncontrolled hazardous waste sites where chromium may have been discarded.
- Chromium is a component of tobacco smoke. Avoid smoking in enclosed spaces like inside the home or car in order to limit exposure to children and other family members.
- Although chromium(III) is an essential nutrient, you should avoid excessive use of dietary supplements containing chromium.

## Is there a medical test to determine whether I've been exposed to chromium?

Since chromium(III) is an essential element and naturally occurs in food, there will always be some level of chromium in your body. Chromium can be measured in hair, urine, and blood.

Higher than normal levels of chromium in blood or urine may indicate that a person has been exposed to chromium. However, increases in blood and urine chromium levels cannot be used to predict the kind of health effects that might develop from that exposure.

## Has the federal government made recommendations to protect human health?

The EPA has established a maximum contaminant level of 0.1 mg/L for total chromium in drinking water.

The FDA has determined that the chromium concentration in bottled drinking water should not exceed 0.1 mg/L.

The Occupational Health and Safety Administration (OSHA) has limited workers' exposure to an average of 0.005 mg/m<sup>3</sup> chromium(VI), 0.5 mg/m<sup>3</sup> chromium(III), and 1.0 mg/m<sup>3</sup> chromium(0) for an 8-hour workday, 40-hour workweek.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for Chromium. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

#### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

#### Phone: 1-800-232-4636

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

#### Division of Toxicology ToxFAQs<sup>TM</sup>

This fact sheet answers the most frequently asked health questions (FAQs) about copper. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Copper is a metal that occurs naturally in the environment, and also in plants and animals. Low levels of copper are essential for maintaining good health. High levels can cause harmful effects such as irritation of the nose, mouth and eyes, vomiting, diarrhea, stomach cramps, nausea, and even death. Copper has been found in at least 906 of the 1,647 National Priority Sites identified by the Environmental Protection Agency (EPA).

#### What is copper?

Copper is a metal that occurs naturally throughout the environment, in rocks, soil, water, and air. Copper is an essential element in plants and animals (including humans), which means it is necessary for us to live. Therefore, plants and animals must absorb some copper from eating, drinking, and breathing.

Copper is used to make many different kinds of products like wire, plumbing pipes, and sheet metal. U.S. pennies made before 1982 are made of copper, while those made after 1982 are only coated with copper. Copper is also combined with other metals to make brass and bronze pipes and faucets.

Copper compounds are commonly used in agriculture to treat plant diseases like mildew, for water treatment and, as preservatives for wood, leather, and fabrics.

## What happens to copper when it enters the environment?

□ Copper is released into the environment by mining, farming, and manufacturing operations and through waste water releases into rivers and lakes. Copper is also released from natural sources, like volcanoes, windblown dusts, decaying vegetation, and forest fires.

□ Copper released into the environment usually attaches to particles made of organic matter, clay, soil, or sand.

□ Copper does not break down in the environment. Copper

compounds can break down and release free copper into the air, water, and foods.

#### How might I be exposed to copper?

□ You may be exposed to copper from breathing air, drinking water, eating foods, or having skin contact with copper, particulates attached to copper, or copper-containing compounds.

□ Drinking water may have high levels of copper if your house has copper pipes and acidic water.

□ Lakes and rivers that have been treated with copper compounds to control algae, or that receive cooling water from power plants, can have high levels of copper. Soils can also contain high levels of copper, especially if they are near copper smelting plants.

 $\Box$  You may be exposed to copper by ingesting coppercontaining fungicides, or if you live near a copper mine or where copper is processed into bronze or brass.

□ You may be exposed to copper if you work in copper mines or if you grind metals containing copper.

#### How can copper affect my health?

Everyone must absorb small amounts of copper every day because copper is essential for good health. High levels of copper can be harmful. Breathing high levels of copper can cause irritation of your nose and throat. Ingesting high levels of copper can cause nausea, vomiting, and diarrhea. Very-high doses of copper can cause damage to your liver and kidneys, and can even cause death.

#### September 2004

**COPPER** 

CAS # 7440-50-8



## **COPPER** CAS # 7440-50-8

#### ToxFAQs<sup>™</sup> Internet address is http://www.atsdr.cdc.gov/toxfaq.html

#### How likely is copper to cause cancer?

We do not know whether copper can cause cancer in humans. The EPA has determined that copper is not classifiable as to human carcinogenicity.

#### How can copper affect children?

Exposure to high levels of copper will result in the same type of effects in children and adults. We do not know if these effects would occur at the same dose level in children and adults. Studies in animals suggest that the young children may have more severe effects than adults, but we don't know if this would also be true in humans. There is a very small percentage of infants and children who are unusually sensitive to copper.

We do not know if copper can cause birth defects or other developmental effects in humans. Studies in animals suggest that high levels of copper may cause a decrease in fetal growth.

## How can families reduce the risk of exposure to copper?

The most likely place to be exposed to copper is through drinking water, especially if your water is corrosive and you have copper pipes in your house. The best way to lower the level of copper in your drinking water is to let the water run for at least 15 seconds first thing in the morning before drinking or using it. This reduces the levels of copper in tap water dramatically.

If you work with copper, wear the necessary protective clothing and equipment, and always follow safety procedures. Shower and change your clothes before going home each day.

## Is there a medical test to show whether I've been exposed to copper?

Copper is found throughout the body; in hair, nails, blood, urine, and other tissues. High levels of copper in these samples can show that you have been exposed to higherthan normal levels of copper. These tests cannot tell whether you will experience harmful effects. Tests to measure copper levels in the body are not usually available at a doctor's office because they require special equipment, but the doctor can send samples to a specialty laboratory.

## Has the federal government made recommendations to protect human health?

The EPA requires that levels of copper in drinking water be less than 1.3 mg of copper per one liter of drinking water (1.3 mg/L).

The U.S. Department of Agriculture has set the recommended daily allowance for copper at 900 micrograms of copper per day ( $\mu$ g/day) for people older than eight years old.

The Occupational Safety and Health Administration (OSHA) requires that levels of copper in the air in workplaces not exceed 0.1 mg of copper fumes per cubic meter of air (0.1 mg/m<sup>3</sup>) and 1.0 mg/m<sup>3</sup> for copper dusts.

#### Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2004. Toxicological Profile for Copper. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Federal Recycling Program



## DIETHYL PHTHALATE CAS # 84-66-2

September 1996

#### Agency for Toxic Substances and Disease Registry ToxFAQs

This fact sheet answers the most frequently asked health questions (FAQs) about diethyl phthlate. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to diethyl phthalate occurs when you use plastics that contain it, and when you eat food from plastic containers made with it. Health effects have not been reported in people exposed to diethyl phthalate. This substance has been found in at least 248 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

#### What is diethyl phthalate?

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

(Pronounced dī ĕth'əl thăl'āt)

Diethyl phthalate is a colorless liquid that has a bitter, disagreeable taste. This synthetic substance is commonly used to make plastics more flexible. Products in which it is found include toothbrushes, automobile parts, tools, toys, and food packaging.

Diethyl phthalate can be released fairly easily from these products, as it is not part of the chain of chemicals (polymers) that makes up the plastic. Diethyl phthalate is also used in cosmetics, insecticides, and aspirin.

## What happens to diethyl phthalate when it enters the environment?

- □ Diethyl phthalate has been found in waste sites and landfills from discarded plastics.
- □ It may break down in the air.
- □ It can become attached to particles of dust in the air, and can settle out.
- □ It is broken down to harmless products by microorganisms in soil and water.
- □ Small amounts of it can build up in fish and shellfish living in water containing it.

#### How might I be exposed to diethyl phthalate?

- **□** Eating food that was contained in plastic packaging.
- **□** Eating contaminated fish and shellfish.
- □ Drinking contaminated water near waste sites and land-fills that contain diethyl phthalate.
- □ Using consumer products that contain it.

#### How can diethyl phthalate affect my health?

No information is available regarding possible effects caused by diethyl phthalate if you breathe, eat, or drink it, or if it touches your skin. Very high oral doses of diethyl phthalate have caused death in animals, but brief oral exposures to lower doses caused no harmful effects.

Weight gain was decreased in animals that ate high doses of diethyl phthalate for a long time. The liver and kidneys of these animals were larger than normal, but not from any harmful effects of diethyl phthalate.

It is not known if diethyl phthalate causes birth defects in humans. Fewer live babies were born to female animals that were exposed to diethyl phthalate throughout their lives.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, Public Health Service Agency for Toxic Substances and Disease Registry

### DIETHYL PHTHALATE CAS # 84-66-2

#### ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

The presence of an extra rib has been noted in newborn rats whose mothers were given very high dietary doses of diethyl phthalate, but this effect is not considered harmful by all scientists.

Some birth defects occurred in rats whose mothers received high doses of diethyl phthalate by injection during pregnancy. Humans are not exposed to diethyl phthalate by this route.

Diethyl phthalate can be mildly irritating when applied to the skin of animals. It can also be slightly irritating when put directly into the eyes of animals.

#### How likely is diethyl phthalate to cause cancer?

The EPA has determined that diethyl phthalate is not classifiable as to its carcinogenicity in humans.

Diethyl phthalate placed directly on the skin of rats daily for 2 years was not carcinogenic. Liver tumors were seen in mice that had diethyl phthalate placed directly on their skin daily for 2 years. This type of tumor is common in mice, and the smallest dose resulted in a similar number of tumors as the largest dose.

It is not clear if diethyl phthalate will cause a similar effect in humans. Other studies of cancer in humans or animals exposed to diethyl phthalate were not located.

## Is there a medical test to show whether I've been exposed to diethyl phthalate?

There is no routine medical test to show if you have been exposed to diethyl phthalate. However, it has been measured in semen, fat, and kidney tissue in laboratory studies. These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

## Has the federal government made recommendations to protect human health?

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of diethyl phthalate be reported to the EPA.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) recommend a maximum concentration of 5 milligrams of diethyl phthalate per cubic meter of air (5 mg/m<sup>3</sup>) in workplace air for an 8- to 10-hour workday, 40-hour workweek.

#### Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Insecticide: Substance that kills insects.

Milligram (mg): One thousandth of a gram.

Oral: Taken by mouth.

Synthetic: Made by humans.

Tumor: An abnormal mass of tissue.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for diethyl phthalate (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

**Federal Recycling Program** 



## Lead – ToxFAQs<sup>™</sup>

#### CAS # 7439-92-1

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

#### What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

## What happens to lead when it enters the environment?

- Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- When lead is released to the air, it may travel long distances before settling to the ground.
- Once lead falls onto soil, it usually sticks to soil particles.
- Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

#### How might I be exposed to lead?

- Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.

Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences • Using health-care products or folk remedies that contain lead.

#### How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high-levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

#### How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services (DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.



#### How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

## How can families reduce the risks of exposure to lead?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.
- Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children.
- If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

#### Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for

#### CAS # 7439-92-1

lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (µg/dL). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

## Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/ or if they have a brother, sister, or playmate who has had lead poisoning. CDC has updated its recommendations on children's blood lead levels. Experts now use an upper reference level value of 97.5% of the population distribution for children's blood lead. In 2012-2015, the value to identify children with blood lead levels that are much higher than most children have, is 5 micrograms per deciliter ( $\mu$ g/dL). EPA limits lead in drinking water to 15 µg per liter.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

#### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

#### Phone: 1-800-232-4636.

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

## Manganese - ToxFAQs™

#### CAS # 7439-96-5

This fact sheet answers the most frequently asked health questions (FAQs) about manganese. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Manganese is a trace element and eating a small amount from food or water is needed to stay healthy. Exposure to excess levels of manganese may occur from breathing air, particularly where manganese is used in manufacturing, and from drinking water and eating food. At high levels, it can cause damage to the brain. Manganese has been found in at least 869 of the 1,669 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

#### What is manganese?

Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese is silvercolored, but does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese occurs naturally in most foods and may be added to some foods.

Manganese is used principally in steel production to improve hardness, stiffness, and strength. It may also be used as an additive in gasoline to improve the octane rating of the gas.

## What happens to manganese when it enters the environment?

- Manganese can be released to the air, soil, and water from the manufacture, use, and disposal of manganese-based products.
- Manganese cannot break down in the environment. It can only change its form or become attached to or separated from particles.
- In water, manganese tends to attach to particles in the water or settle into the sediment.
- The chemical state of manganese and the type of soil determine how fast it moves through the soil and how much is retained in the soil.
- The manganese-containing gasoline additive may degrade in the environment quickly when exposed to sunlight, releasing manganese.

#### How might I be exposed to manganese?

- The primary way you can be exposed to manganese is by eating food or manganese-containing nutritional supplements. Vegetarians, who consume foods rich in manganese such as grains, beans and nuts, as well as heavy tea drinkers, may have a higher intake of manganese than the average person.
- Certain occupations like welding or working in a factory where steel is made may increase your chances of being exposed to high levels of manganese.
- Manganese is routinely contained in groundwater, drinking water, and soil at low levels. Drinking water containing manganese or swimming or bathing in water containing manganese may expose you to low levels of this chemical.

#### How can manganese affect my health?

Manganese is an essential nutrient, and eating a small amount of it each day is important to stay healthy.

The most common health problems in workers exposed to high levels of manganese involve the nervous system. These health effects include behavioral changes and other nervous system effects, which include movements that may become slow and clumsy. This combination of symptoms when sufficiently severe is referred to as "manganism". Other less severe nervous system effects such as slowed hand movements have been observed in some workers exposed to lower concentrations in the work place.



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences

## Manganese

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Exposure to high levels of manganese in air can cause lung irritation and reproductive effects.

Nervous system and reproductive effects have been observed in animals after high oral doses of manganese.

#### How likely is manganese to cause cancer?

The EPA concluded that existing scientific information cannot determine whether or not excess manganese can cause cancer.

#### How can manganese affect children?

Studies in children have suggested that extremely high levels of manganese exposure may produce undesirable effects on brain development, including changes in behavior and decreases in the ability to learn and remember. We do not know for certain that these changes were caused by manganese alone. We do not know if these changes are temporary or permanent. We do not know whether children are more sensitive than adults to the effects of manganese, but there is some indication from experiments in laboratory animals that they may be.

Studies of manganese workers have not found increases in birth defects or low birth weight in their offspring. No birth defects were observed in animals exposed to manganese.

## How can families reduce the risk of exposure to manganese?

- Children are not likely to be exposed to harmful amounts of manganese in the diet. However, higherthan-usual amounts of manganese may be absorbed if their diet is low in iron. It is important to provide your child with a well-balanced diet.
- Workers exposed to high levels of airborne manganese in certain occupational settings may accumulate manganese dust on their work clothes. Manganese-contaminated work clothing should be

removed before getting into your car or entering your home to help reduce the exposure hazard for yourself and your family.

## Is there a medical test to determine whether I've been exposed to manganese?

Several tests are available to measure manganese in blood, urine, hair, or feces. Because manganese is normally present in our body, some is always found in tissues or fluids.

Because excess manganese is usually removed from the body within a few days, past exposures are difficult to measure with common laboratory tests.

#### Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to manganese in drinking water at concentrations of 1 mg/L for up to 10 days is not expected to cause any adverse effects in a child.

The EPA has established that lifetime exposure to 0.3 mg/L manganese is not expected to cause any adverse effects.

The Food and Drug Administration (FDA) has determined that the manganese concentration in bottled drinking water should not exceed 0.05 mg/L.

The Occupational Health and Safety Administration (OSHA) has established a ceiling limit (concentration that should not be exceeded at any time during exposure) of 5 mg/m<sup>3</sup> for manganese in workplace air.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological Profile for Manganese. Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

#### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

#### Phone: 1-800-232-4636.

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

## **Mercury** - ToxFAQs<sup>™</sup>

#### CAS # 7439-97-6

This fact sheet answers the most frequently asked health questions (FAQs) about mercury. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Mercury, at high levels, may damage the brain, kidneys, and developing fetus. This chemical has been found in at least 714 of 1,467 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

#### What is mercury?

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, some dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

## What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.

• Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

#### How might I be exposed to mercury?

- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fossil fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace.
- Practicing rituals that include mercury.

#### How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences

## Mercury

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#### How likely is mercury to cause cancer?

There are inadequate human cancer data available for all forms of mercury. Mercuric chloride has caused increases in several types of tumors in rats and mice, and methylmercury has caused kidney tumors in male mice. The EPA has determined that mercuric chloride and methylmercury are possible human carcinogens.

#### How can mercury affect children?

Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and may accumulate there, possibly causing damage to the developing nervous system. It can also pass to a nursing infant through breast milk. However, the benefits of breast feeding may be greater than the possible adverse effects of mercury in breast milk.

Mercury's harmful effects that may affect the fetus include brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak. Children poisoned by mercury may develop problems of their nervous and digestive systems, and kidney damage.

## How can families reduce the risk of exposure to mercury?

Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs. Do not vacuum up spilled mercury, because it will vaporize and increase exposure. If a large amount of mercury has been spilled, contact your health department. Teach children not to play with shiny, silver liquids.

Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children.

Pregnant women and children should keep away from rooms where liquid mercury has been used.

Learn about wildlife and fish advisories in your area from your public health or natural resources department.

## Is there a medical test to determine whether I've been exposed to mercury?

Tests are available to measure mercury levels in the body. Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury. Your doctor can take samples and send them to a testing laboratory.

## Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2 parts of mercury per billion parts of drinking water (2 ppb).

The Food and Drug Administration (FDA) has set a maximum permissible level of 1 part of methylmercury in a million parts of seafood (1 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 0.1 milligram of organic mercury per cubic meter of workplace air (0.1 mg/m<sup>3</sup>) and 0.05 mg/m<sup>3</sup> of metallic mercury vapor for 8-hour shifts and 40-hour work weeks.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

#### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.



## METHYL TERT-BUTYL ETHER (MTBE) CAS # 1634-04-4

#### Agency for Toxic Substances and Disease Registry ToxFAQs

#### September 1997

This fact sheet answers the most frequently asked health questions (FAQs) about methyl *tert*-butyl ether (MTBE). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Methyl *tert*-butyl ether (MTBE) is a flammable liquid which is used as an additive in unleaded gasoline. Drinking or breathing MTBE may cause nausea, nose and throat irritation, and nervous system effects. MTBE has been found in at least 11 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

#### What is methyl tert-butyl ether?

(Pronounced měth/əl tūr/shē-ĕr/ē byoot/l ē/thər)

Methyl *tert*-butyl ether (MTBE) is a flammable liquid with a distinctive, disagreeable odor. It is made from blending chemicals such as isobutylene and methanol, and has been used since the 1980s as an additive for unleaded gasolines to achieve more efficient burning.

MTBE is also used to dissolve gallstones. Patients treated in this way have MTBE delivered directly to their gall bladders through special tubes that are surgically inserted.

## What happens to MTBE when it enters the environment?

- MTBE quickly evaporates from open containers and surface water, so it is commonly found as a vapor in the air.
- □ Small amounts of MTBE may dissolve in water and get into underground water.
- □ It remains in underground water for a long time.

- □ MTBE may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- □ MTBE may be broken down quickly in the air by sunlight.
- □ MTBE does not build up significantly in plants and animals.

#### How might I be exposed to MTBE?

- □ Touching the skin or breathing contaminated air while pumping gasoline.
- □ Breathing exhaust fumes while driving a car.
- □ Breathing air near highways or in cities.
- Drinking, swimming, or showering in water that has been contaminated with MTBE.
- □ Receiving MTBE treatment for gallstones.

#### How can MTBE affect my health?

Breathing small amounts of MTBE for short periods may cause nose and throat irritation. Some people exposed to MTBE while pumping gasoline, driving their cars, or working

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, Public Health Service Agency for Toxic Substances and Disease Registry

### METHYL TERT-BUTYL ETHER (MTBE) CAS # 1634-04-4

#### ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

in gas stations have reported having headaches, nausea, dizziness, and mental confusion. However, the actual levels of exposure in these cases are unknown. In addition, these symptoms may have been caused by exposure to other chemicals.

There are no data on the effects in people of drinking MTBE. Studies with rats and mice suggest that drinking MTBE may cause gastrointestinal irritation, liver and kidney damage, and nervous system effects.

#### How likely is MTBE to cause cancer?

There is no evidence that MTBE causes cancer in humans. One study with rats found that breathing high levels of MTBE for long periods may cause kidney cancer. Another study with mice found that breathing high levels of MTBE for long periods may cause liver cancer.

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified MTBE as to its carcinogenicity.

## Is there a medical test to show whether I've been exposed to MTBE?

MTBE and its breakdown product, butyl alcohol, can be detected in your breath, blood, or urine for up to 1 or 2 days after exposure. These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. There is no other test specific to determining MTBE exposure.

## Has the federal government made recommendations to protect human health?

The EPA has issued guidelines recommending that, to protect children, drinking water levels of MTBE not exceed 4 milligrams per liter of water (4 mg/L) for an exposure of 1-10 days, and 3 mg/L for longer-term exposures.

The American Conference of Governmental Industrial Hygienists (ACGIH) has recommended an exposure limit of 40 parts of MTBE per million parts of air (40 ppm) for an 8hour workday, 40-hour workweek.

#### Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or gas.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

#### References

This ToxFAQs information is taken from the 1996 Toxicological Profile for Methyl *tert*-Butyl Ether produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

**Federal Recycling Program** 



## **Polycyclic Aromatic Hydrocarbons (PAHs) - ToxFAQs**<sup>™</sup>

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

## What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl'ĭ-sī'klĭk ăr'ə-măt'ĭk hī'drə-kar'bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

## What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.

- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

#### How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.
- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.



Agency for Toxic Substances and Disease Registry Division of Toxicology and Human Health Sciences

## **Polycyclic Aromatic Hydrocarbons**

#### How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

#### How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

#### Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

## Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m<sup>3</sup>). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m<sup>3</sup> averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m<sup>3</sup> for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

#### Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

#### References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

#### Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs<sup>™</sup> Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

APPENDIX B Cold Stress Program

#### **1.0 PURPOSE & INTRODUCTION**

The purpose of this document is to educate the employee about exposure to cold environments and the effects of hypothermia and other cold-related injuries. Through proper use of personal protective equipment (PPE), engineering and administrative controls, and education, cold injury—both to the extremities and the body's core temperature—can be prevented.

#### **2.0 SCOPE**

The program described herein is intended for use by employees engaged in work with the potential for exposure to cold environments. Training will be provided annually to all those potentially affected prior to the start of field work potentially involving cold exposure.

#### **3.0 WORKING IN COLD ENVIRONMENTS**

#### 3.1 Metabolic Responses

The human body is designed to function best at a rectal temperature of 99-100 °F. The body maintains this temperature in two ways: by gaining heat from food and muscular work; or, by losing it through radiation and sweating. By constricting blood vessels of the skin and/or shivering, the body uses its first line of cold defense.

Temperature control of the body is better understood by dividing the body into two main parts: the shell and the core. The shell is comprised of the skin, capillaries, nerves, muscles, and fat. Other internal organs such as the heart, lungs, brain, and kidneys make up the core.

During exposure to cold, the skin is first affected. Blood in the peripheral capillaries is cooled, sending a signal to a portion of the brain called the hypothalamus. Regulating body temperature is one of the many basic body functions of the hypothalamus. Acting like a thermostat, adjustments are performed to maintain normal body temperatures. When a chill signal is received, two processes are begun by the hypothalamus: conserve heat already in the body and generate new heat.

Heat conservation is performed through constriction of the blood vessels in the skin (shell), thus reducing heat loss from the shell and acting as an insulator for the core. Sweat glands are also inhibited, thus preventing heat loss by evaporation.

Additional fuel for the body is provided in the form of glucose. Glucose causes the heart to beat faster, sending oxygen and glucose-rich blood to the tissue where needed. In an attempt to produce heat, the muscles rapidly contract. This process is better known as "shivering," and generates heat similarly to that created by strenuous activity, raising the body's metabolic rate.

During physical activity and fatigue, the body is more prone to heat loss. As exhaustion approaches, blood vessels can suddenly enlarge, resulting in rapid loss of heat. Exposure to extreme cold causes nerve pulses to be slowed, resulting in fumbling, sluggish, and clumsy reactions.

#### 4.0 COLD INJURIES

Cold injuries are classified into two categories: local and general. Local injuries include frostbite, frostnip, chilblain, and trenchfoot. General injuries include hypothermia and blood vessel abnormalities

(genetically or chemically induced). Factors contributing to cold injury include: exposure to humidity and high winds; contact with wetness or metal; inadequate clothing; age; and general health. Allergies, vascular disease, excessive smoking and/or drinking, and certain drugs and medicines are physical conditions that can compound the effects of exposure to a cold environment.

#### 4.1 Hypothermia

Hypothermia is a condition of reduced body temperature. Most cases develop in air temperatures between 30-50 °F, not taking wind-chill factor in consideration.

Symptoms of hypothermia are uncontrolled shivering and the sensation of cold. The heartbeat slows and sometimes becomes irregular, weakening the pulse and changing blood pressure. Changes in the body chemistry cause severe shaking or rigid muscles; vague or slow slurred speech; memory lapses; incoherence; and drowsiness. Cool skin, slow irregular breathing, low blood pressure, apparent exhaustion, and fatigue after rest can be seen before complete collapse.

As the core temperature drops, the victim can become listless, confused, and make little or no effort to keep warm. Pain in the extremities can be the first warning of dangerous exposure to cold. Severe shivering must be taken as a sign of danger. At a core body temperature of about 85 °F, serious problems develop due to significant drops in blood pressure, pulse rate, and respiration. In some cases, the victim may die.

Sedative drugs and alcohol increase the risk of hypothermia. Sedative drugs interfere with the transmission of impulses to the brain. Alcohol dilates blood vessels near the skin's surface, increasing heat loss and lowering body temperature.

Table B1 provides information on the onset of hypothermia and metabolic responses at different body temperatures.

#### 4.2 Raynaud's Phenomenon

Raynaud's Phenomenon is the abnormal constriction of the blood vessels of the fingers on exposure to cold temperatures, resulting in blanching of the ends of the fingers. Numbness, itching, tingling, or a burning sensation may occur during related attacks. The disease is also associated with the use of vibrating hand tools in a condition sometimes called White Finger Disease. Persistent cold sensitivity, ulceration, and amputations can occur in severe cases.

#### 4.3 Acrocyanosis

Acrocyanosis is caused by exposure to the cold and reduces the level of hemoglobin in the blood, resulting in a slightly blue, purple, or gray coloring of the hands and/or feet.

#### 4.4 Thromboangitis Obliterans

Thromboangitis obliterans is clotting of the arteries due to inflammation and fibrosis of connective tissue surrounding medium-sized arteries and veins. This is one of the many disabling diseases that can also result from tobacco use. Gangrene of the affected limb often requires amputation.

#### 4.5 Frostbite

Frostbite is the freezing of the body tissues due to exposure to extremely low temperatures, resulting in damage to and loss of tissue. Frostbite occurs because of inadequate circulation and/or insulation, resulting in freezing of fluids around the cells of the body tissues. Most vulnerable parts of the body are the nose, cheeks, ears, fingers, and toes.

Frostbite can affect outer layers of skin or can include the tissues beneath. Damage can be serious, with permanent loss of movement in the affected parts, scarring, necrotic tissue, and amputation all possibilities. Skin and nails that slough off can grow back.

The freezing point of the skin is about 30 °F. As wind velocity increases, heat loss is greater and frostbite will set in more rapidly.

There are three degrees of frostbite: first degree, freezing without blistering and peeling; second degree, freezing with blistering and peeling; and third degree, freezing with death of skin tissues and possibly the deeper tissues.

The following are symptoms of frostbite:

- 1. Skin changes color to white or grayish-yellow, progresses to reddish-violet, and finally turns black as the tissue dies;
- 2. Pain may be felt at first, but subsides;
- 3. Blisters may appear; and
- 4. Affected part is cold and numb.

The first symptom of frostbite is usually an uncomfortable sensation of coldness followed by numbness. Tingling, stinging, cramping, and aching feelings will be experienced by the victim. Frostbite of the outer layer of the skin has a waxy or whitish look and is firm to the touch. Cases of deep frostbite cause severe injury. The tissues are cold, pale, and solid. The victim is often unaware of the frostbite until someone else observes these symptoms. It is therefore important to use the "buddy system" when working in cold environments, so that any symptoms of overexposure can be noted.

Table B2 describes the cooling power of wind on exposed flesh. This information can be used as a guide for determining equivalent chill temperatures when the wind is present in cold environments.

#### 4.6 Trench Foot and Chilblains

Trench foot is swelling of the foot caused by long, continuous exposure to cold without freezing, combined with persistent dampness or immersion in water. Edema (swelling), tingling, itching and severe pain occurs, followed by blistering, necrotic tissue, and ulcerations. Chilblains have similar symptoms as trench foot, except that other areas of the body are affected.

#### 4.7 Frostnip

Frostnip occurs when the face or extremities are exposed to a cold wind, causing the skin to turn white.

#### 5.0 **PREVENTION OF COLD STRESS**

Cold stress can be prevented through a combination of various factors: acclimation; water and salt displacement; medical screening; proper clothing selection; and training and education. Through the use of engineering controls, work practices, work/rest schedules, environmental monitoring, and consideration of the wind-chill temperature, the employee can be protected.

#### 5.1 Acclimation

Acclimation can be achieved to some degree. Sufficient exposure to cold causes the body to undergo changes to increase comfort and reduce the risk of injury. However, these changes are minor and require repeated exposure to cold and uncomfortable temperatures to induce them.

#### 5.2 Dehydration

The dryness of cold air causes the body to lose a significant amount of water through the skin and lungs. It is essential that caffeine-free, non-alcoholic beverages be available at the worksite for fluid replacement. Dehydration also increases the risk of injury due to cold and affects blood flow to the extremities.

#### 5.3 Diet

A well-balanced diet is important for employees working in cold environments. Diets restricted only to certain foods may not provide the necessary elements for the body to withstand cold stress, leaving the worker vulnerable.

#### 5.4 Control Measures

When the wind chill factor results in an equivalent temperature of -26 °F, continuous exposure of the skin will not be permitted. Any worker exposed to temperatures of 36 °F or less who becomes immersed in water will be given dry clothing immediately and treated for hypothermia at the local hospital if any symptoms of hyperthermia are present. Notification of this incident will be provided to the Health and Safety Division immediately after sending the worker to the hospital.

#### 5.5 Environmental Controls

The following are some ways that environmental controls can be used to reduce the effects of a cold environment:

- 1. General or spot heating should be used to increase temperature in certain areas in the workplace;
- 2. Warm air jets, radiant heaters, or contact warm plates can be used to warm the worker's hands if fine work is to be performed with bare hands for 10 to 20 minutes or more;
- 3. Shield the work area if air velocity at the worksite is increased by wind, draft, or ventilating equipment;
- 4. Metal handles of tools and control bars should be covered with thermal insulating material at temperatures below 30 °F;
- 5. Unprotected metal chair seats will not be used in cold environments;
- 6. When appropriate and feasible, equipment and processes will be substituted, isolated, relocated, or redesigned;
- 7. Power tools, hoists, cranes, or lifting aids will be used to reduce the metabolic workload;
- 8. Heated warming shelters will be made available for continuous work being performed in an equivalent temperature of 20 °F or below and workers will be encouraged to use the shelters regularly; and
- 9. Administrative work practice controls.

Work practices and guidelines can be designed and developed to reduce exposure to cold stress. Some of these may include:

- 1. Work-rest schedules to reduce the peak of cold stress;
- 2. Enforce scheduled breaks;
- 3. Enforce intake of caffeine-free, non-alcoholic beverages;
- 4. Schedule work that has potential exposure to cold stress for the warmest part of the day;
- 5. Move work to warmer areas, whenever possible;
- 6. Assign extra workers for high-demand tasks;
- 7. Provide relief workers for other workers needing breaks;
- 8. Teach basic principles of recognizing and preventing cold stress;
- 9. Use the buddy system for work at 10 °F or below, and keep within eyeshot;
- 10. Allow new employees to adjust to the conditions before they work full-time in cold environments;
- 11. Minimize sitting and standing in one place for long periods of time; and
- 12. Include weight and bulkiness of clothing when estimating work performance requirements and weights to be lifted;

Table B3 provides a work/warm-up schedule for cold environments, with wind chill taken into account.

#### 5.6 Special Considerations

Older workers and workers with circulatory problems should be extra careful in cold environments. Sufficient sleep and good nutrition are important preventive measures for maintenance tolerance to the cold. Double shifts and overtime work should be avoided when working in cold environments.

If any of the following symptoms are observed on-site, the affected worker will immediately go to warm shelter:

- Onset of heavy shivering;
- Frostnip;
- Feeling of excessive fatigue;
- Drowsiness; and
- Euphoria.

After entering the warm shelter, the outer layer of clothing should be removed. If the clothing is wet from sweat and perspiration, dry clothing should be provided. If this is not feasible, then the clothing should be loosened to allow sweat to evaporate.

Anyone working in cold environments and on prescribed medication should consult their physician concerning any possible side effects due to cold stress. Those individuals suffering from diseases and/or taking medication that interferes with normal body temperature regulation or reduces the tolerance to cold will not be allowed to work in temperatures of 30 °F or below.

#### 6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

In choosing PPE for cold environments, it is important to maintain airspace between the body and outer layer of clothing to retain body heat. The more air pockets, the better the insulation. The clothing should also allow for the evaporation of sweat if the skin is wet.

The most important parts of the body to protect are the feet, hands, head, and face. Hands and feet become cooled most easily, because of their distance from the heart. Keeping the head covered is equally important. As much as 40% of body heat loss is through the head when it is exposed.

Ideal clothing for exposure to cold environments is made of wool, polypropylene, or other wicking fabrics. Loosely fitted clothing also aids in sweat evaporation. Recommended clothing may include the following:

- 1. Polypropylene under shirt and shorts under thermal underwear (preferably two-piece);
- 2. Wool socks;
- 3. Wool or thermal pants, lapped over boot tops to keep out snow and water;
- 4. Suspenders (belts can constrict and reduce circulation);
- 5. Insulated work boots, preferably waterproof. Safety toe, if necessary;
- 6. Wool or cotton shirt;
- 7. Parka;
- 8. Knit cap/hard hat liner;
- 9. Wool mittens or gloves (depending on the dexterity required); and
- 10. Face mask or scarf.

Dirty or greasy clothing loses much of its insulation value. Dirty clothing crushes air pockets, allowing air to escape more easily. Also, denim is not a good protective fabric. It is loosely woven and allows water to penetrate and wind to blow away body heat.

Core Temperature		Clinical Signa		
°C	°F	Cinical Signs		
37.6	99.6	"Normal" Rectal Temperature		
37	98.6	"Normal" Oral Temperature		
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss		
35	95.0	Maximum shivering		
34	93.2	Victim conscious and responsive, with normal blood pressure		
33	91.4	Severe hypothermia below this temperature		
32	89.6	Consciousness clouded, blood pressure becomes difficult to obtain		
31	87.8	pupils dilated but react to light, shivering ceases		
30	86.0	Progressive loss of consciousness, muscular rigidity increases,		
29	84.2	decreases		
28	82.4	Ventricular fibrillation possible with myocardial irritability		

Table B1Progressive Clinical Presentation of Hypothermia

Core Temperature					
°C	°F	Clinical Signs			
27	80.6	Voluntary motion ceases, pupils non-reactive to light, deep tendon			
26	78.8	and superficial reflexes absent			
25	77.0	Ventricular fibrillation may occur spontaneously			
24	75.2	Pulmonary edema			
22	71.6	Maximum risk of ventricular fibrillation			
20	68.0	Cardiac standstill			
18	64.4	Lowest accidental hypothermia victim to recover			
17	62.6	Isoelectric electroencephalogram			
9	48.2	Lowest artificially cooled hypothermia patient to recover			
Presentations approximately related to core temperature. Reprinted from the January 1982 issue of					
American Family Physician, published by the American Academy of Family Physicians.					

 Table B1

 Progressive Clinical Presentation of Hypothermia

Table B2
<b>Cooling Power of Wind on Exposed Flesh as Equivalent Temperature</b>

Estimated	Actual Temperature Reading (Degrees Fahrenheit)											
Wind Speed	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
(mph)	Equivalent Chill Temperature (°F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
	INCREASING											
	LI	TTLE I	DANGE	ER	DANGER GREAT DANGER							
	In	< hr wit	h dry sk	xin.	Danger from			Flash may fragze within 20				
	Maximum danger of false fi sense of security.			freezing of exposed		Fiesh may freeze within 50						
				flesh within one seconds.								
	minute.											
Developed by the	Developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA.											
Wind speeds gro	eater tha	un 40 m	ph have	little a	dditiona	l effect.						
Trenchfoot and immersion foot may occur at any point.												

Air Temp.	Sunny Sky	No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx)	°F (approx)	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-26° to - 28°	-15° to - 19°	(Norm. Bro	eaks) 1	(Norm.Br	eaks) 1	75 min.	2	55 min.	3	40 min.	4
-29° to - 31°	-20° to - 24°	(Norm. Bro	eaks) 1	75 min	2	55 min.	3	40 min.	4	30 min.	5
-32° to - 34°	-25° to - 29°	75 min	2	55 min.	3	40 min.	4	30 min.	5	Non-emer work shou	gency ald cease
-35° to - 37°	-30° to - 34°	55 min.	3	40 min.	4	30 min.	5	Non-eme work sho	ergency ould cease		
-38° to - 39°	-35° to - 39°	40 min.	4	30 min.	5	Non-emer work shou	gency ald cease				
-40° to - 42°	-40° to - 44°	30 min.	5	Non-emer work shou	gency ald cease						
-43° & below	-45° & below	Non-emerg work shoul	gency d cease								

Table B3 Threshold Limit Values Work/Warm-up Schedule for 4-Hour Shift

Notes:

Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For light to moderate work (limited physical motion), apply the schedule one step lower. For example, at -30 °F with no noticeable wind (step 4, a worker at a job with little physical movement should have a maximum work period of 40 minutes with 4 breaks in a 4-hour period.

The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 mph, light flag moves; 10 mph, light flag fully extended; 15 mph, raises newspaper sheet; 20 mph, blowing drifting snow.

If only the wind chill cooling rate is available, a rough rule of thumb for applying it rather than the temperature and wind velocity factors given above would be: 1) special warm-up breaks should be initiated at a wind-chill cooling rate of about 17 watts per square meter  $(W/m^2)$ ; 2) all non-emergency work should have ceased at or before a wind-chill of 2250 W/m<sup>2</sup>. In general, the warm-up schedule provided above slightly under-compensates for the wind at the warmer temperatures, assuming acclimatization and clothing appropriate for winter work. On the other hand, the chart over-compensates for the actual temperatures in the colder ranges, since windy conditions prevail at extremely low temperatures.

Threshold limit values (TLVs) apply only for workers in dry clothing.

Adapted from Occupational Health and Safety Division, Saskatchewan Department of Labor.

APPENDIX C Heat Stress Program

#### **1.0 INTRODUCTION**

Heat stress is one of the most common (and potentially serious) illnesses at job sites. Although it is caused by a number of interacting factors, donning the proper personal protective equipment (PPE) puts the worker at a much higher risk during warmer environmental conditions. The results of heat stress range from fatigue to serious illness or death. Through regular fluid replacement and other preventive measures, heat stress can be controlled, leading to increased efficiency and a higher level of safety on the job.

#### 2.0 PURPOSE

The purpose of this document is to create an awareness among employees concerning the body's physiologic responses to heat, different types of heat stress that can affect the body, recognition of signs and symptoms, first aid treatment, and preventive measures.

#### **3.0 SOURCES OF HEAT**

There are two sources of heat that are important to anyone working in a hot environment:

- Internally generated metabolic heat; and
- Externally imposed environmental heat.

#### 4.0 PHYSIOLOGIC RESPONSES TO HEAT

The human body maintains a fairly constant internal temperature, even though it is exposed to varying environmental temperatures. To keep internal body temperatures within safe limits, the body must get rid of its excess heat, primarily through varying the rate and amount of blood circulation through the skin and the release of fluid onto the skin by the sweat glands. These automatic responses usually occur when the temperature of the blood exceeds 98.6 °F and are kept in balance and controlled by the brain. In this process of lowering internal body temperature, the heart begins to pump more blood, blood vessels expand to accommodate the increased flow, and the microscopic blood vessels (capillaries) which thread through the upper layers of the skin begin to fill with blood. The blood circulates closer to the surface of the skin, and the excess heat is lost to the cooler environment.

If the heat loss from increased blood circulation through the skin is not adequate, the brain continues to sense overheating and signals the sweat glands in the skin to release large quantities of sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating large quantities of heat from the body.

As environmental temperatures approach normal skin temperature, cooling of the body becomes more difficult. If air temperature is as warm as or warmer than the skin, blood brought to the body surface cannot lose its heat. Under these conditions, the heart continues to pump blood to the body surface, the sweat gland pour liquids containing electrolytes onto the surface of the skin, and the evaporation of the sweat becomes the principal effective means of maintaining a constant body temperature. Sweating does not cool the body unless the moisture is removed from the skin by evaporation. In high humidity, the evaporation of sweat from the skin is decreased and the body's efforts to maintain an acceptable body temperature may be significantly impaired. These conditions adversely affect an individual's ability to work in the hot environment. With so much blood going to the external surface of the body, relatively less goes to the active muscles, the brain, and other internal organs; strength declines; and fatigue occurs sooner than it would otherwise. Alertness and mental capacity also may be affected. Workers who must

perform delicate or detailed work may find their accuracy suffering, and others may find their comprehension and retention of information lowered.

When temperature differences exist between two or more bodies, heat can be transferred. Net heat transfer is always from the body (or object) of higher temperature to that of lower temperature and occurs by one or more of the following mechanisms:

- Conduction: The transfer of heat from one point to another within the body, or from one body to another when both bodies are in physical contact. Conduction can be a localized source of discomfort from direct physical contact with a hot or cold surface, it is normally not a significant factor to total heat stress.
- Convection: The transfer of heat from one place to another by moving gas or liquid. Natural convection results from differences in density caused by temperature differences. Thus, warm air is less dense than cool air.
- Radiation: The process by which energy, electromagnetic (visible and infrared), is transmitted through space without the presence or movement of matter in or through this space.

#### 5.0 PREDISPOSING FACTORS TO HEAT STRESS

Factors that may predispose an individual to heat stress vary according to the individual. These factors include:

- Lack of physical fitness;
- Lack of acclimatization;
- Age;
- Dehydration;
- Obesity;
- Drug/alcohol abuse;
- Infection;
- Sunburn;
- Diarrhea; and
- Chronic disease.

Predisposing factors and an increased risk of excessive heat stress are both directly influenced by the type and amount of PPE worn. PPE adds weight and bulk, reduces the body's access to normal heat exchange mechanisms (evaporation, convection and radiation), and increases energy expenditure.

#### 6.0 FORMS OF HEAT STRESS AND FIRST AID

The following excerpts were taken from NIOSH Publication No. 86-112, Working in Hot Environments:

"Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders. Among the most common are heat stroke, heat exhaustion, heat cramps, fainting and heat rash."

#### 6.1 Heat Stroke

Heat Stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, and red or spotted. Body temperature is usually 105 °F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

Individuals with signs or symptoms of heat stroke require immediate hospitalization. First aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment, at a medical facility, should be directed to the continuation of the cooling process and the monitoring of complications that often accompany heat stroke. Early recognition and treatment are the only means of preventing permanent brain damage or death.

#### 6.2 Heat Exhaustion

Heat exhaustion includes several clinical disorders having symptoms that may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

In most cases, treatment involves having the victim rest in a cool place and drink plenty of liquids. Victims with mild cases of heat exhaustion usually recover spontaneously with this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.

#### 6.3 Heat Cramps

Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large amounts of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly after, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs, or abdomen, but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

#### 6.4 Fainting

Fainting occurs in workers not accustomed to hot environments and who stand erect and immobile in the heat.

With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain. Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting.

#### 6.5 Heat Rash (Prickly Heat)

Heat rash, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not as easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can be very uncomfortable and may reduce a worker's performance. The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin."

#### 7.0 SELECTION OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

During work periods where the increased risk of heat stress exists, each item's benefit will be carefully evaluated. Once the PPE is chosen, safe work durations/rest periods will be determined based on the following conditions:

- Anticipated work rate;
- Ambient temperature and humidity; and
- Level of protection.

#### 8.0 **PREVENTION OF HEAT STRESS**

Prevention of heat stress will be addressed in the following manner:

- Adjustment of work schedules.
- Modification of work/rest schedules.
  - 1. Enforce work slowdowns, as needed.
  - 2. Rotate personnel to minimize overstress or overexertion.
  - 3. When possible, work will be scheduled and performed during cooler hours.
- Providing shelter or shaded areas to protect personnel during rest periods.
- Maintaining workers' body fluids at normal levels.
  - 1. Drink approximately 12 to 16 ounces of non-caffeinated liquid (preferably water, Gatorade or equivalent) prior to the start of work. Caffeinated fluids act to dehydrate the worker.
  - 2. Workers will be urged to drink a cup or two every 15 to 20 minutes, or at each break. A total of 1 to 1.5 gallons of water per individual per day are recommended for fluid replacement under heat stress conditions, but more may be required.
- Encouraging physical fitness among the workers.
- Gradually acclimatizing workers on Site to help build up an "immunity" to the conditions.
  - 1. Heat acclimatization can usually be induced in 5 to 7 days of exposure at a hot job. For workers with previous experience with the job, acclimatization will include exposures of 50% for day 1, 60% for day 2, 80% for day 3, and 100% for the remaining additional days.
- Providing cooling devices during prolonged work or severe heat exposure.
  - 1. Supply field showers or hose down areas.
  - 2. Supply personnel with cooling jackets, vests, and suits.
- Training workers in recognition and treatment of heat stress.
- Using the buddy system that depends on the recognition of signs and symptoms of heat stress.
- Identifying heat-intolerant individuals through medical screening.

APPENDIX D Incident Report Form

#### **Incident Report Form**

Supervisor's Name:

#### **Basic Rules for Accident Investigation**

- Find the cause to prevent future accidents Use an unbiased approach during investigation.
- Interview witnesses & injured employees at the scene conduct a walkthrough of the accident.
- Conduct interviews in private Interview one witness at a time.
- Get signed statements from all involved.
- Take photos or make a sketch of the accident scene.
- What hazards are present what unsafe acts contributed to accident?
- Ensure hazardous conditions are corrected immediately.

Date & Time		Location				
Task Performed		Witnesses				
Resulted In	Injury Fatality					
	Property Damage	Property Damage				
Injured		Injured				
Describe Accident F	Describe Accident Facts & Events					

Supervisors Root Cause Analysis (Check ALL that apply to the accident)				
Unsafe Act	Unsafe Conditions			
Improper work technique	Poor workstation design			
Safety rule violation	Unsafe operation method			
Improper PPE or PPE not used	Improper maintenance			
Operating without authority	Lack of direct supervision			
Failure to warn or secure	Insufficient training			
Operating at improper speeds	Lack of experience			
	Insufficient knowledge of job			
By-passing Safety device				
Protective equipment not in use	Slippery conditions			

Improper loading or placement	Excessive noise				
Improper lifting	Inadequate guarding of hazards	Inadequate guarding of hazards			
Servicing Machinery in motion	Defective tools/equipment				
Horseplay	Poor housekeeping				
Drug or alcohol use	Insufficient lighting				
Unsafe Acts require a written warnin	g and re-training before the employee resumes w	ork.			
Date	Date				
Retraining Assigned	Unsafe Condition Guarded				
Retraining Assigned Retraining Completed	Unsafe Condition Guarded Unsafe Condition Corrected				

APPENDIX H

AS-BUILT SSDS AND BIOSPARGE SYSTEM DRAWINGS



MONITORING POINT						
	LOCATIONS					
ID	BUILDING ROOM NAME	ROOM #				
MP-1	LAUNDRY ROOM	083				
MP-2	CORRIDOR/ ENTRANCE	NA				
MP-3	DOH DOG RUN B2	046				
MP-4	TREATMENT ROOM	073				

NOTES

4. SLOPE SOLID HORIZONTAL VENTING SYSTEM PIPE A MINIMUM OF 1% UNIFORMLY TOWARDS THE VENTING SYSTEM SLOTTED PIPING OR CONDENSATE DRAIN.

5. CONDENSATE DRAIN LOCATIONS TO BE SUBMITTED BY CONTRACTOR AND APPROVED BY ENGINEER. CONTRACTOR TO SUBMIT SHOP DRAWINGS INDICATING PIPE INVERTS, CONDENSATE DRAIN LOCATIONS, AND DRAIN DETAILS TO ENGINEER FOR APPROVAL.



LEGEND

PROJECT SITE BOUNDARY EXTENT OF BUILDING EXTENT OF VAPOR BARRIER AND GAS PERMEABLE AGGREGATE UNDER SLAB PIPE SLEEVE THROUGH GRADE BEAM (SEE DETAIL 5 ON ENV-102) COMMUNICATION SLEEVE THROUGH FOUNDATION ELEMENT (SEE DETAIL 4 ON ENV-102) 4" Ø SLOTTED SCHEDULE 40 PVC PIPE WITH PVC END CAP 4" Ø SOLID SCHEDULE 40 PVC PIPE 4" Ø RISER SLAB PENETRATION (SEE DETAIL 9 ON ENV-102) VACUUM MONITORING POINT (SEE DETAIL 7 ON ENV-102) CONDENSATE DRAIN (SEE DETAILS 10a AND 10b ON ENV-102) REFERENCE TO DETAIL ON DRAWING ENV-103

SUBSLAB DEPRESSURIZATION SYSTEM LAYOUT



ENV-100

NOTE: PIPE SPACING NOT TO SCALE

#### 1. THIS PLAN SHALL NOT TO BE USED FOR STRUCTURAL, ARCHITECTURAL OR OTHER REFERENCE PURPOSES EXCEPT FOR THE VENTING SYSTEM AND VAPOR BARRIER.

2. COORDINATE ALL WORK FOR VENTING SYSTEM INSTALLATION WITH OTHER TRADES BEFORE INSTALLATION.

3. THE FULL EXTENTS OF THE BUILDING CONSTRUCTION BENEATH THE FLOOR SLABS SHALL BE LINED WITH GAS PERMEABLE AGGREGATE AND VAPOR BARRIER EXCEPT AS NOTED ON THIS DRAWING AND AS REQUIRED BY FOUNDATION ELEMENT LAYOUTS IN STRUCTURAL PLANS. ALL DEVIATIONS SHALL BE PROPOSED IN SHOP DRAWING SUBMITTALS PRIOR TO INSTALLATION IN THE FIELD.

6. REFER TO DRAWINGS ENV-102 THROUGH ENV-104 FOR VENTING SYSTEM PIPING, RISER, GAS VAPOR BARRIER, GAS PERMEABLE AGGREGATE, AND EXHAUST STACK DETAILS AND SECTIONS.

7. CONTRACTORS TO SUPPLY SHOP DRAWINGS OF PROPOSED PIPE LAYOUTS & PIPE INVERTS IN COORDINATION WITH LATEST FOUNDATION PLANS TO ENSURE ACCEPTABLE PIPE PITCH & INSTALLATION DETAILS.

8. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AGAINST ARCHITECTURAL AND BUILDING PLANS. NOTIFY ENGINEER OF ANY DISCREPANCY PRIOR TO CONSTRUCTION.

9. BASE MAP FROM OCV ARCHITECTS (FIRST FLOOR FOUNDATION PLAN, DATED 04-10-2020).

10. GAS PERMEABLE AGGREGATE SHALL HAVE NOMINAL SIZE OF 1 INCH TO 1/2 INCH AND COMFORM TO ASTM C33 STANDARD SPECIFICATION FOR CONCRETE AGGREGATE SIZE #5 AS PER THE TABLE BELOW:

#### ASTM #5 AGGREGATE GRADATION

(FOR PIPE TRENCHES)					
SIEVE SIZE	PERCENT FINER BY WEIGHT				
1.5 inch	100				
1 inch	90 to 100				
3/4 inch	20 to 55				
1/2 inch	0 to 10				
3/8 inch	0 to 5				

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MICHELLE LAPIN, P.E.

REVISIONS

DATE DESCRIPTION 03/09/2020 100% CD SUBMISSION 05/12/2020 100% CD SUBMISSION

PROJECT: 180291

No.

Queens Animal Shelter

DRAWN BY CHECKED BY MRV ΡM DATE SCALE AS NOTED 07/02/2019

SHEET TITLE AS-BUILT SSDS AND VAPOR BARRIER PLAN

SHEET NO. ENV-100 )20





SCALE IN F

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# 6

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LEGEND 8" Ø SCH. 40 GALVANIZED STEEL PIPE VERTICAL RISER AND IDENTIFICATION NUMBER

ABOVEGROUND SSDS MANIFOLD

BLOWER (SEE DETAIL 1 ON ENV-104)

10 FOOT RADIUS FROM SUCTION FAN/EXHAUST STACK

	MICH	ELLE	LAPIN, P.E.				
	I	REVIS	SIONS				
No.	DATE		DESCRIPTION				
	03/09/2020	1	00% CD SUBMISSION				
	05/12/2020	1	00% CD SUBMISSION				
PRC	JECT: 1802	91					
	Quee	ens	Animal				
	S	She	lter				
DRA	wn by MRV		снескед ву РМ				
SCA		<u> </u>	DATE				
/ SHE	AS NOTEL	)	07/02/2019				
	AS-BUILT						
	SSDS RISER PLAN						
SHE	ET NO.						
	ENV-101						

SHEET 2 OF 7



# NEW YORK CITY, NY 10012 STRUCTURAL CONSULTANT DOMINICK R. PILLA ASSOCIATES, PC JOSELOW AND ASSOCIATES, LLC WHITE PLAINS, NY 10603 MICHELLE LAPIN, P.E. REVISIONS DESCRIPTION 100% CD SUBMISSION 100% CD SUBMISSION **Queens Animal** Shelter CHECKED BY PM DATE 07/02/2019 **AS-BUILT** SSDS DETAILS I

SHEET 3 OF 7

ENV-102








ONLY. SUBMIT TO SCALE DRAWING SHOWING PROPOSED ARRANGEMENT. CONTRACTOR IS REQUIRED TO OBTAIN APPROVAL OF ARRANGEMENT.

- ENSURE ALL PENETRATIONS ARE SEALED IN ACCORDANCE WITH WARRANTY.
- INCLUDING SUPPORT SYSTEM FOR EXHAUST STACK.



ENV-104/

Not to Scale

INSTRUMENT SCHEDULE							
ITEM DESCRIPTION SERVICE		LOCATION	REQUIREMENTS	RANGE	REMARKS		
MAGNEHELIC GAUGE	PRESSURE DIFFERENTIAL	SSD SYSTEM	RISER MANIFOLD	N/A	0-10" WC	FOR EACH 4" MANIFOLD LEG AND 8" RISERS	DWYER I
VACUUM INDICATOR	VACUUM GAUGE	SSD SYSTEM	BLOWER INLET	N/A	0-15" WC	8" GALVANIZED STEEL PIPE	NOSH
VFD	VARIABLE FREQUENCY DRIVE	SSD SYSTEM	MAIN ROOF	3 PHASE, 60 HZ, 208 VAC	N/A	COORDINATE LOCATION WITH ARCHITECT	W
DPS	DIFFERENTIAL PRESSURE SWITCH	SSD SYSTEM ALARM	BLOWER INLET	N/A	0.4 - 1.6" WC	CONNECT TO BMS FOR EACH BLOWER ASSEMBLY	DWYER IN
CONTROL PANEL	BLOWER	SSD SYSTEM	MAIN ROOF	1 PHASE, 60 HZ, 115 VOLT	N/A	FOR EACH BLOWER ASSEMBLY	INCLUDES
FLOW METER	FLOW	SSD SYSTEM	RISERS @ FIRST FLOOR	N/A	N/A	FOR EACH 4" MANIFOLD LEG	DWYER INS
ALARM INDICATION STATION	SSDS MONITOR	SSD SYSTEM	ROOF	TBD	N/A	FOR EACH SSDS BLOWER	

	BLOWER SCHEDULE									
UNIT NO.	AREAS SERVED	SERVICE	LOCATION	SIZE	MIN. CFM	MIN. RATE (INCHES WC)		MOTOR REQUIREMENTS		MANUFACTURER/MODEL
SF-1	OCCUPIED SPACES	SSD SYSTEM	MAIN ROOF	1.5 HP	600	7	60 HZ	3 PHASE	230/460 VOLTS	CDD 200 ECO (DIRECT DRIVE)
SPARE	N/A	N/A	TO BE DETERMINED	1.5 HP	600	7	60 HZ	3 PHASE	230/460 VOLTS	CDD 200 ECO (DIRECT DRIVE)



2. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF ALL PIPE LAYOUTS, SUB-SLAB SLEEVE, SLAB PENETRATION, AND RISER LOCATIONS FOR APPROVAL.

3. INSTALLATION OF THE SUB-SLAB COMPONENTS AND VENT AND RISER PIPING, AND ROOF PENETRATIONS MUST BE COORDINATED WITH OTHER TRADES FOR THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS. LOCATIONS OF RISER PIPE FROM SUB-SLAB TO ROOF SHALL BE COORDINATED WITH ARCHITECT AND MECHANICAL ENGINEER. RISER PIPE SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION.

4. ALL SOLID HORIZONTAL PIPE RUNS MUST BE PITCHED A MINIMUM OF 1/8 INCH VERTICAL PER FOOT HORIZONTAL (1% SLOPE) TOWARDS EACH SECTION OF SLOTTED VENTING PIPE. THE SYSTEM SHALL BE INSTALLED SUCH THAT NO PORTION WILL ALLOW EXCESS ACCUMULATION OF CONDENSATION. SOLID UNDERGROUND PIPING MAY BE PITCHED TO CONDENSATE DRAIN, SHOULD THEY BE NECESSARY (SEE DETAILS 10a and 10b, ENV-102).

5. ALL CONNECTIONS AT PIPE FITTINGS AND JOINTS SHALL BE LEAK FREE. THIS SHALL BE DEMONSTRATED BY THE PERFORMANCE OF A POSITIVE 1 POUNDS PER SQUARE INCH (PSI) (MIN.) PRESSURE TEST FOLLOWING PIPE/FITTINGS ASSEMBLY BY THE CONTRACTOR. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND PIPING SHALL BE CONSTRUCTED OF 4 INCH SCHEDULE 40 PVC AND ALL ABOVEGROUND RISER PIPING SHALL BE CONSTRUCTED OF 4 INCH SCHEDULE 40 PVC, OR 8 INCH GALVANIZED STEEL PIPE AS SHOWN ON DRAWINGS.

6. REFER TO DRAWINGS ENV-100 THROUGH ENV-103 FOR SSDS PIPING. VAPOR BARRIER, GAS PERMEABLE AGGREGATE, AND COMMUNICATION AND PIPE SLEEVE/OTHER FOUNDATION ELEMENT PENETRATION LOCATIONS AND DETAILS.

7. RISER PIPE SHALL BE PERMANENTLY IDENTIFIED WITHIN EACH FLOOR LEVEL. BACKGROUND SHALL BE SAFETY BLUE WITH WHITE LETTERING. LETTERING SHALL READ: "CAUTION: DO NOT ALTER. SUBSURFACE VAPOR VENT PIPE."

8. EXHAUST STACK SHALL BE SECURELY ANCHORED WITH ADEQUATE STRUCTURAL SUPPORTS.

9. SSDS DESIGN DETAILS AND DRAWINGS ARE ADAPTED FROM EPA DOCUMENT EPA/625/R-92/016. 10. SYSTEM INSTALLATION SHALL ADHERE TO: OCTOBER 2006 FINAL GUIDANCE FOR EVALUATING SOIL VAPOR

INTRUSION IN THE STATE OF NEW YORK PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH), ALL APPLICABLE PORTIONS OF THE BUILDING CODE OF THE CITY OF YONKERS. AS SUCH, POINT OF EXHAUST SHALL BE: MINIMUM 10 FEET ABOVE ROOF.

• AT LEAST 25 FEET FROM ANY ADJOINING OR ADJACENT BUILDINGS, OPERABLE WINDOWS, HVAC INTAKES, SUPPLY REGISTERS, OR ANY OTHER AIR INLETS.

11. CONTRACTOR TO ENSURE THAT TRANSITIONS BETWEEN VAPOR BARRIER AND WATERPROOFING ARE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS AND WILL NOT AFFECT THE WARRANTY OF EITHER PRODUCT.

12. ROOF/SLAB PENETRATIONS AND FIRE PROOFING, INCLUDING FIRE COLLAR, TO BE COMPLETED IN ACCORDANCE WITH ARCHITECTURAL AND PLUMBING SPECIFICATIONS.



4 4 4

NOTE

2" CLR

5

TYPICAL

# OWNER

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MICHELLE LAPIN, P.E.

REVISIONS

DESCRIPTION 100% CD SUBMISSION 100% CD SUBMISSION

# **Queens Animal** Shelter

CHECKED BY PM DATE 07/02/2019

# SSDS EQUIPMENT SCHEDULE AND PROCESS FLOW **AS-BUILT**



5/13/2020

4:22

ENV-105



NOTE: PIPE SPACING NOT TO SCALE

Α'

LEGEND

PROJECT SITE BOUNDARY EXTENT OF BUILDING EXTENT OF VAPOR BARRIER AND GAS PERMEABLE AGGREGATE UNDER SLAB BIOSPARGE MANIFOLD RISER SLAB PENETRATION (HDPE PIPE TO SYSTEM MANIFOLD) RI GROUNDWATER SAMPLE LOCATION BIOSPARGE TREATMENT WELL WITH 10' RADIUS OF INFLUENCE

REFERENCE TO DETAIL ON DRAWING ENV-106

IDER SI AB		

# MICHELLE LAPIN, P.E. REVISIONS DATE DESCRIPTION No. 03/09/2020 100% CD SUBMISSION 100% CD SUBMISSION 05/12/2020 PROJECT: 180291 Queens Animal Shelter DRAWN BY CHECKED BY MRV PM SCALE DATE AS NOTED 07/02/2019 SHEET TITLE AS-BUILT BIOSPARGE TREATMENT

SYSTEM PLAN

ENV-105

SHEET 6 OF 7

SHEET NO.

(845) 727-6377 (FAX) MEP 30 GLENN STREET SUITE 203

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PIPE SLEEVE THROUGH GRADE BEAM OR FOUNDATION WALL (SEE DETAILS 4 AND 5 ON ENV-106)

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SHEET 7 OF 7

APPENDIX I

QUALITY ASSURANCE PROJECT PLAN

# QUEENS ANIMAL SHELTER AND CARE CENTER

151 WOODWARD AVENUE QUEENS, NEW YORK

# **Revised Quality Assurance Project Plan**

AKRF Project Number: 180291 NYSDEC BCP Site Number: C241230

**Prepared for:** 

New York State Department of Environmental Conservation Division of Environmental Remediation, Remedial Bureau B 625 Broadway Albany, New York 12233

#### **On Behalf Of:**

1906 Flushing LLC 11 Park Place, Suite 805 New York, NY 10007





AKRF, Inc. 440 Park Avenue South, 7<sup>th</sup> Floor New York, New York 10016 (212) 696-0670

## **JUNE 2024**

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### ATTACHMENT

Attachment A – Resumes of Key Project Personnel

#### **1.0 INTRODUCTION**

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of the Site Management Plan (SMP) and associated appendices at the Queens Animal Shelter and Care Center site, hereinafter referred to as the "Site". The Site is located at 151 Woodward Avenue in Queens, New York and is identified on the New York City Tax Map as Queens Borough Block 3376, Lot 1. The Site was remediated under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) (BCP Site No. C241230).

The objective of this QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) during sampling performed to evaluate the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site. Adherence to the QAPP will ensure that defensible data will be obtained to confirm the successful operation and maintenance of remedial systems.

#### 2.0 **PROJECT TEAM**

The project team will be drawn from AKRF professional and technical personnel and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 Code of Federal Regulation (CFR) Part 1910. The following sections describe the key project personnel and their responsibilities.

#### 2.1 Remedial Engineer (RE)

Ms. Michelle Lapin, P.E. will serve as the RE for the project under the SMP. As the RE, Ms. Lapin oversaw the design of all Institutional Controls (ICs) and Engineering Controls (ECs) at the Site and will oversee operation and maintenance (O&M) of ECs under the SMP. Ms. Lapin's resume and the resumes of other key project personnel are included in Attachment A.

#### 2.2 Quality Assurance/Quality Control (QA/QC) Officer

Ms. Deborah Shapiro, QEP will serve as the QA/QC officer under the SMP. As the QA/QC officer, Ms. Shapiro will be responsible for adherence to this QAPP and will review the procedures with all personnel prior to commencing any fieldwork, and will conduct periodic Site visits to assess implementation of the procedures. Ms. Shapiro's resume is included in Attachment A.

#### 2.3 **Project Manager**

The project manager will be responsible for directing and coordinating all elements of the SMP. The project manager will prepare reports and participate in meetings with the Site owner and/or the NYSDEC. Mr. Patrick Diggins will serve as the project manager for the SMP. Mr. Diggins's resume is included in Attachment A.

#### 2.4 Field Team Leader

The field team leader will be responsible for supervising the daily sampling and health and safety activities in the field and will ensure adherence to the Site Management Plan (SMP). The field team leader will report to the project manager on a regular basis regarding daily progress and any deviations from the SMP. The field team leader will be a qualified, responsible person, able to act professionally and promptly during required activities. The field team leader will be established for each task; however, Mr. Michael Bates is expected to be a field team leader for much of the work under the SMP. Mr. Bates' resume is included in Attachment A.

#### 2.5 Project Quality Assurance/Quality Control (QA/QC) Officer

The QA/QC Officer will be responsible for adherence to this QAPP. The QA/QC officer will review the procedures with all personnel prior to commencing any fieldwork and will assess implementation of the required procedures. Ms. Michelle Lapin, P.E. will serve as the QA/QC officer for the SMP. Ms. Lapin's resume is included in Attachment A.

#### 2.6 Laboratory Quality Assurance/Quality Control (QA/QC) Officer

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. He/She will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued. The laboratory QA/QC officer will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be determined upon selection of a contract laboratory(s) for the SMP.

#### **3.0 STANDARD OPERATING PROCEDURES (SOPS)**

The following sections describe the SOPs for the monitoring activities included in the SMP. During these operations, all field personnel will wear appropriate personal protective equipment (PPE) and safety monitoring will be performed as described in the Site-specific Health and Safety Plan (HASP) provided as Appendix C of the SMP. SMP implementation will include sampling associated with the operation and maintenance (O&M) of the sub-slab depressurization system (SSDS) and Biosparge System. The SMP also includes inspections of the SSDS, Biosparge System, and the Site cover system, and an Excavation Work Plan (EWP) and other provisions and appropriate actions to be taken in the event that future renovation or redevelopment of the Site requires the breaching of the composite cover system and excavation/removal of underlying soil/fill.

In all instances, any atypical or unexpected findings noted during inspections, sampling events, or SMPgoverned field work will be communicated immediately to the environmental professional managing the Site work and, as necessary, to the NYSDEC project manager or NYSDEC's successor agency.

#### 3.1 Excavation and/or Site Cover System Disturbance

The procedures for excavation and/or other invasive work that may disturb remaining contamination beneath the Site composite cover system will be as follows:

- Soil removal and/or other invasive activities will be completed as needed in accordance with the SMP and EWP.
- Following invasive work, the demarcation layer will be replaced to provide a visual reference to the top of the residual management zone (RMZ).
- The Site cover system will be replaced to restore the condition to that which existed prior to the excavation. In general, the restoration types must match or exceed the existing material and thickness conditions of the Site cover types presented in the SMP to maintain Site composite cover system integrity across the entire Site.
- Decontaminate all equipment used in composite cover system disturbance as described in Sections 3.2 and 3.3 of this QAPP.

#### **3.2** Decontamination of Sampling Equipment

All sampling equipment (drilling rods and casing, macrocore samplers, probe rods, etc.) will be either dedicated or decontaminated between sampling locations. The decontamination procedure will be as follows:

- 1. Scrub using tap water/Alconox<sup>™</sup> mixture and bristle brush.
- 2. Rinse with tap water.
- 3. Scrub again with tap water/Alconox<sup>TM</sup> and bristle brush.
- 4. Rinse with distilled water.
- 5. Air-dry the equipment, if possible.

Decontamination will be conducted within 55-gallon drums or on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground or drains.

#### **3.3** Heavy Equipment Decontamination

Decontamination of chemically-contaminated heavy equipment (e.g., augers, excavator buckets) will be accomplished using high-pressure steam or dry decontamination with brushes and shovels. Decontamination will take place on a decontamination pad and all liquids used in the decontamination procedure will be collected. Vehicles or equipment brought into an exclusion zone will be treated as contaminated and will be decontaminated prior to removal. All liquids used in the decontamination procedure will be collected, stored and disposed of in accordance with federal, state, and local regulations. Personnel performing this task will wear the proper PPE as prescribed in the Site-Specific Health and Safety Plan (HASP).

A decontamination area will be established around the planned excavation area, adjacent to the environmental enclosure. The floor of the decontamination area will be covered with 6-mil plastic sheeting, as necessary, and bermed to prevent spreading of decontamination fluids or potential discharge to the ground surface.

All equipment in direct contact with known or potentially contaminated material will be either dedicated or decontaminated prior to handling less contaminated material or removal from the Site. Decontamination of chemically contaminated heavy equipment will be accomplished using high-pressure steam or by dry decontamination with brushes and shovels. All liquids used in the decontamination procedure will be collected, stored, and disposed of in accordance with federal, state, and local regulations.

# 3.4 Management of Investigation-Derived Waste (IDW) and Remedial Operation and Maintenance (O&M) Waste

Any IDW and remedial O&M waste will be containerized in New York State Department of Transportation (NYSDOT)-approved 55-gallon drums or other appropriate containers. The drums will be sealed at the end of each workday and labeled with the date, the well or boring number(s), the type of waste (i.e., drill cuttings, development water or purge water) and the name of an AKRF point-of-contact. Drums will be staged in secure areas, away from public access to the extent practicable.

Soil/fill samples collected from soil boring or excavation activities will be used for waste characterization of soil/fill, since such data would be biased towards areas which are expected to be most contaminated. Additional waste characterization soil or other samples may be collected, if requested by the disposal facility. All IDW and remedial waste will be disposed of or treated according to applicable local, state, and federal regulations.

### 4.0 SAMPLING AND LABORATORY PROCEDURES

#### 4.1 Import Soil/Fill Sampling

Prior to importing soil/fill for use as backfill, the intended imported material will be evaluated using the following procedures:

- A segregated stockpile of the intended imported material will be made available for sampling at a frequency and for the required parameters as outlined in Section 5.4(e) 10 of NYSDEC DER-10, and/or the NYSDEC-issued Sampling, Analysis, and Assessment of PFAS, dated April 2023.
- Soil/fill sample(s) will be collected from the segregated stockpile for analysis in accordance with NYSDEC requirements and sampling results will be submitted to NYSDEC for approval.
- No material will be added to or removed from the segregated stockpile intended for import following the sample collection.
- Samples will be collected into laboratory-supplied containers.
- Samples will be kept in an ice-filled cooler or refrigerator, with the exception of any asbestos samples, until receipt by the laboratory.
- The clean soil/fill layer will be underlain by a demarcation layer such as orange snow fence to indicate the top of the original soil/fill.
- Decontaminate all sampling equipment between sampling locations as described in Sections 3.2 and 3.3 of this QAPP.

#### 4.2 Reuse Sampling

Prior to reuse as backfill, excavated material will be evaluated using the criteria below:

- Concrete or demolition debris that does not exhibit signs of contamination will be sampled for asbestos prior to reuse on-site.
- Soil/fill material proposed for reuse will be sampled at a frequency and for the required parameters as outlined in NYSDEC's DER-10, Table 5.4, and/or the NYSDEC-issued Sampling, Analysis, and Assessment of PFAS, dated April 2023.
- Samples will be collected into laboratory-supplied containers.
- Samples will be kept in an ice-filled cooler or refrigerator, with the exception of any asbestos samples, until receipt by the laboratory.
- Decontaminate all sampling equipment between sampling locations as described in Sections 3.2 and 3.3 of this QAPP.

#### 4.3 Endpoint Soil Sampling

In the event that evidence of contamination [odors, staining, elevated photoionization detector (PID) readings, or analytical results of soil samples above NYSDEC Part 375 Restricted Residential Soil Cleanup Objectives (RRSCOs)] is identified during any breach to the cover system or excavation of soil/fill as part of the redevelopment or renovation of the Site, endpoint soil sampling activities will be performed in accordance with NYSDEC DER-10. Per NYSDEC DER-10 Section 5.4, sidewall samples will be collected a minimum one sample for every 30 linear feet and bottom samples will be collected at a frequency of one every 900 square feet.

Endpoint soil samples will be analyzed for NYSDEC Final Commissioner's Policy - Soil Cleanup Guidance (CP-51) volatile organic compounds (VOCs) by EPA Method 8260C, target compound list (TCL) semivolatile organic compounds/base-neutrals (SVOCs/BNs) by EPA Method 8270D, and Toxicity Characteristic Leaching Procedure (TCLP) metals by EPA Method 6010C.

Soil sampling will be conducted according to the following procedures:

- Characterize the sample according to the modified Burmister soil classification system.
- After selecting which samples will be analyzed in the laboratory, fill the required laboratorysupplied sample jars with the soil from the selected sampling location or labeled sealable plastic bags. Seal and label the sample jars as described in Section 4.6 of this QAPP and place in an ice-filled cooler.
- Decontaminate any reusable soil sampling equipment between sample locations as described in Section 3.2 of this QAPP.
- Record boring number, sample depth, and sample observations (evidence of contamination, PID readings, soil classification) in field logbook and boring log data sheet, if applicable.

#### 4.4 Groundwater Sampling

Groundwater sampling will be conducted in accordance with the United States Environmental Protection Agency (EPA) low flow methodology. The proposed monitoring well locations are presented in Figure 2. Groundwater sampling will be generally conducted as follows:

- Remove the well plug and immediately measure the vapor concentrations in the well headspace with a PID calibrated to the manufacturer's specifications.
- Measure the depth to water and total well depth, and check for the presence of non-aqueous phase liquid (NAPL) using an oil-water interface probe. Measure the thickness of NAPL, if any, and record in field book and well log. If present, collect a sample of NAPL using a disposable plastic weighted bailer or similar collection device. Groundwater samples will not be collected from wells containing measurable NAPL.
- Connect dedicated tubing to either a submersible or bladder pump and lower the pump such that the intake of the pump is set at the midpoint of the water column within the screened interval of the well. Connect the discharge end of the tubing to the flow-through cell of a Horiba Quanta multi-parameter (or equivalent) meter. Connect tubing to the output of the cell and place the discharge end of the tubing in a five-gallon bucket.
- Activate the pump at the lowest flow rate setting of the pump.
- Measure the depth to water within the well. The pump flow rate may be increased such that the water level measurements do not change by more than 0.3 foot as compared to the initial static reading. The well-purging rate should be adjusted so as to produce a smooth, constant (laminar) flow rate and so as not to produce excessive turbulence in the well. The expected targeted purge rate will be approximately 0.5 liter and will be no greater than 3.8 liters per minute.
- Transfer discharged water from the 5-gallon buckets to 55-gallon drums designated for wellpurge water.
- During purging, collect periodic samples and analyze for water quality indicators (e.g., turbidity, pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity) with measurements collected approximately every five minutes.

- Continue purging the well until turbidity is less than 50 NTU and water quality indicators have stabilized to the extent practicable. The criteria for stabilization will be three successive readings for the following parameters and criteria:
  - Dissolved Oxygen +/- 0.3 milligram per Liter (mg/L)
  - Turbidity <50 nephthalometric turbidity units (NTU)
  - ORP/Eh +/- 10 millivolts (mV)
  - Specific Conductance +/- 3% millisievert per centimeter (mS/cm)
  - PH +/- 0.1 pH units

If the water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, purging may be discontinued. Efforts to stabilize the water quality for the well must be recorded in the field book, and samples may then be collected as described herein.

After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing and place into the required sample containers. Label the containers as described in Section 4.9.1 of this QAPP and place in an ice-filled cooler for shipment to the laboratory. Groundwater samples will be analyzed for Part 3785 and Target Compound List (TCL) VOCs by EPA Method 8260C.

Collect one final field sample and analyze for turbidity and water quality parameters (pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity).

Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume), and observations in the project logbook and field data sheet, if applicable.

Once sampling is complete, remove the pump and tubing from the well. Dispose of the dedicated equipment and decontaminate reusable equipment, as described in Section. The purge water will be managed as described in Section 4.12 of this QAPP.

#### 4.5 Sub-Slab Depressurization System (SSDS) Operation and Maintenance Sampling

Four vapor monitoring points (VMPs) were installed during remedial action implementation at strategic locations to inspect induced vacuum conditions during the operation of the SSDS and SVES. Vacuum will be monitored at these locations at regular intervals as designated in the SMP.

#### 4.5.1 Vacuum Monitoring

The procedures for instantaneously screening the vacuum monitoring points are as follows:

- Remove the access manhole cover.
- Attach the analog vacuum gauge or digital manometer with male Quick-Connect fitting to the female quick connect fitting at the monitoring point well head and document reading.
- Detach vacuum gauge/manometer and confirm that Quick-Connect female fitting is closed.
- Replace the access manhole.

#### 4.6 SSDS Sampling

#### 4.6.1 System Vacuum Monitoring

The procedures for instantaneously screening the vacuum monitoring points are as follows:

- Remove the access manhole.
- Attach the analog vacuum gauge or digital manometer with male Quick-Connect fitting to the female Quick-Connect fitting at the monitoring point well head and document reading.
- Detach vacuum gauge/manometer and confirm that Quick-Connect female fitting is closed/sealed.
- Replace the access manhole.

#### 4.6.2 Soil Vapor Air Sampling

Sub-slab soil vapor sampling will be conducted at the Site as part of the Soil Vapor Intrusion Evaluation (SVIE), as described in the RAWP and SMP. Sampling will be conducted in accordance with the New York State Department of Health (NYSDOH) Vapor Intrusion Guidance Document.

The soil vapor sampling is to be conducted, in accordance with the following details:

- Each sub-slab soil vapor sample point will be purged using a Gilair Plus pump at a rate of about 0.2 liters per minute (L/min) to evacuate a minimum of three sample tubing volumes prior to sample collection. As a QA/QC measure, an inert tracer gas (i.e., helium) will be introduced into an above-grade sampling chamber to ensure that the sample points are properly sealed, thereby preventing subsurface infiltration of ambient air. Direct readings of helium of less than 10 percent in the sampling tube will be considered sufficient to verify a tight seal. Once a sufficiently tight seal is verified at each sample point, the purged soil vapor will be monitored for VOCs using a PID.
- Record the vacuum reading from the vacuum gauge on the canister at the beginning of the eight-hour sampling period;
- Open the valve of the canister and record the time in the field book. At the end of the eight-hour sampling period, close the valves, remove the flow-rate controllers and vacuum gauges, install caps on the canisters, and record the time; and
- Place SUMMA canisters in shipping containers for transportation to the laboratory. The canisters will be labeled and transported under standard chain-of-custody (CoC) protocol to the laboratory for analysis of VOCs by EPA Method TO-15.

Repeat these procedures for all of the sampling locations.

After purging, sub-slab soil vapor samples and co-located indoor air samples will be collected into laboratory-supplied, batch-certified, 6-liter SUMMA<sup>®</sup> canisters calibrated to collect the samples over eight hours.

#### 4.6.3 Indoor/Ambient Air Sampling

Indoor air and ambient air sampling may be conducted at the Site. If implemented, sampling will be conducted in accordance with the New York State Department of

Health (NYSDOH) Vapor Intrusion Guidance Document. Indoor air/ambient air sampling will be performed at the Site following system failure greater than 48 hours in accordance with the following details:

- The indoor air sampling is to be conducted following the completion of a presampling inspection and chemical inventory of the Site building.
- Place a labeled 6-Liter SUMMA<sup>®</sup> canister at the breathing zone level (3 to 4 feet above ground surface) in sampling locations established by NYSDEC and NYSDOH.
- Record the vacuum reading from the vacuum gauge on the canister at the beginning of the 8-hour sampling period.
- Open the valve of the canister and record the time in the field book. At the end of the 8-hour sampling period, close valves, remove flow-rate controllers and vacuum gauges, install caps on canisters, and record time.
- Place SUMMA canisters in shipping containers for transportation to laboratory.
- Repeat procedure for all of the sampling locations.

#### 4.7 Laboratory Methods

Table 1 summarizes the laboratory methods that will be used to analyze field samples as well as the sample container type, preservation, and applicable holding times. Other analytes may be added if required by the disposal facility. An Environmental Laboratory Approval Program (ELAP)-certified laboratory will be used for all chemical analyses in accordance with DER-10 2.1(b) and 2.1(f), including NYSDEC July 2005 Analytical Services Protocol (ASP) Category B Deliverables.

Sample Type	Analysis	Method Container Type		Preservative	Hold Time
	Target Compound List (TCL) Volatile Organic Compounds (VOCs)	8260C	3 EnCore <sup>®</sup> or TerraCore <sup>®</sup> samplers and 2 oz. plastic jar	≤ 6 °C	48 hours to extract; 14 days to analyze
	TCL Semivolatile Organic Compounds (SVOCs)	8270D	8 oz. Glass Jar	≤ 6 °C	14 days to extract; 40 days to analyze
Soil/Fill (Reuse/Backfill)	Total Analyte List (TAL) Metals, and Hexavalent Chromium	6000/7000 Series, 6010C, and 7196A	8 oz. Glass Jar	≤ 6 °C	6 months holding time; Mercury 28 days holding time; Hexavalent chromium 30 days to extract, 7 days to analyze
()	Total Polychlorinated Biphenyls (PCBs)	8260C	3 EnCore <sup>®</sup> or TerraCore <sup>®</sup> samplers and 2 oz. plastic jar	≤6 °C	48 hours to extract; 14 days to analyze
	Pesticides	8081B	4 oz. clear glass jar	4 °C	5 days to extract, 49 days to analyze
	1,4-Dioxane	8270D plus Selective Ion Monitoring (SIM); 0.35 μg/L RL	1-Liter Amber Jar	≤6 °C	7 days to extract; 40 days to analyze
	Per- and Polyfluoroalkyl Substances (PFAS)	Draft Method 1633; 0.2 ng/L RL	3 x 250mL Polypropylene Bottles	≤ 6 °C, Trizma	14 days to extract; 28 days to analyze
	CP-51 VOCs	8260	Encore samplers (3), 2 oz. plastic jar	4 °C	48 hours
	TCL SVOCs-BNs	8270D	4 oz. clear glass jar	4 °C	5 days to extract, 49 days to analyze
	TCLP Metals	6010C	4 oz. clear glass jar	4 °C	14 days 26 days
Soil/Fill (Endpoint Sampling)	1,4-Dioxane	8270D plus Selective Ion Monitoring (SIM); 0.35 μg/L RL	1 L Amber Jar	≤6 °C	7 days to extract; 40 days to analyze
	PFAS	Draft Method 1633; 0.2 ng/L RL	3 x 250mL Polypropylene Bottles	≤6 °C, Trizma	14 days to extract, 28 days to analyze
Groundwater Sampling	VOCs	Part 375 and TCL by Method 8260	3 VOAs	HCl to pH < 2 and $\leq 6$ °C	14 days to analyze if preserved

 Table 1

 Laboratory Analytical Methods for Analysis Groups

AKRF, Inc.			
Oueens Animal Shelter	and Care Center	(BCP Site No.	. C241230)

Sample Type	Analysis	Method	Container Type	Preservative	Hold Time
Sub-Slab Soil Vapor/Indoor Air/Ambient AIr Sampling	VOCs	TO-15	6-L SUMMA <sup>®</sup> Canister	None	30 days

#### 4.8 Quality Control (QC) Sampling

In addition to the laboratory analysis of the investigative soil samples, additional analysis will be included for QC measures, as required by the NYSDEC July 2005 ASP Category B sampling techniques. The QC samples will include field blanks, trip blanks, matrix spike/matrix spike duplicates (MS/MSD), and blind duplicate samples at a minimum frequency of one sample per 20 field samples collected or per sample delivery group (SDG). No additional QC samples will be collected during waste classification sampling unless required by the disposal facility. Table 2 provides a summary of the field samples and QA/QC samples to be analyzed by the laboratory.

Table 2Field Sample and QC Sample Quantities

			QC Samples				
Sample Type	Parameters	Analytical Method <sup>1</sup>	Field Samples	Field Blank <sup>2</sup>	Trip Blank <sup>2</sup>	MS/MSD <sup>3</sup>	Duplicate <sup>3</sup>
	VOCs	EPA 8260C	TBD	1/20 (TBD)	1 (Laboratory- Supplied)	1/20 (TBD)	1/20 (TBD)
Soil	SVOCs, TAL Metals, Mercury, PCBs, Pesticides, 1,4-Dioxane, and PFAS	EPA 8270D, 6010C/7471B, 8082A, 8081B, 8270D SIM, and Draft 1633	TBD	1/20	NA	1/20	1/20
Groundwater	VOCs	EPA 8260	TBD	1/20 (TBD)	1 (Laboratory- Supplied)	1/20 (TBD)	1/20 (TBD)
Sub-Slab Soil Vapor/Indoor Air/Ambient Air Sampling	VOCs	TO-15	TBD	NA	NA	NA	NA
Notes: MS/MSD – matrix TBD – sampling to NA – not applicabl	spike/matrix spike duplic be determined based on v e	ate work activities	<ul> <li><sup>1</sup> – NYSDEC July 2005 ASP Category B deliverables</li> <li><sup>2</sup> – One trip blank per shipment with VOC analyses</li> <li><sup>3</sup> – One MS/MSD and duplicate sample per twenty field samples or sample shipment</li> </ul>				

#### 4.9 Sample Handling

#### 4.9.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody (COC) documents, and laboratory reports. All samples will be amended with the collection date at the end of the sample name in a year, month, day (YYYYMMDD) format. Blind duplicate sample nomenclature will consist of: the sample type, followed by an "X"; MS/MSD sample nomenclature will consist of the parent sample name only but triplicate sample volume will be collected and the COC comment section will explain that the additional volume is for running the MS/MSD; and trip and field blanks will consist of "TB-" and "FB-", respectively, followed by a sequential number of the trip/field blanks collected within the SDG and the matrix (soil or groundwater). In accordance with NYSDEC Environmental Quality Information System (EQuIS<sup>TM</sup>)

protocol, special characters will not be used for sample nomenclature and sample IDs below 10 will be amended with a "0". Sample nomenclature examples are provided in Table 3.

Table 3Examples of Sample Nomenclature

Sample Description	Sample Designation
Soil endpoint sample collected from 1 to 2 feet below grade at the north wall of an excavation	EP-N 1-2_YYYYMMDD
Duplicate soil sample collected from 1 to 2 feet at the north wall of the excavation	EP-N 1-2_YYYYMMDD
Import soil sample collected from the first imported stockpile	ISP-1_YYYYMMDD
Reuse soil sample collected from the first on-site stockpile	SP-1_YYYYMMDD
Groundwater sample collected from a monitoring well	MW-08B_YYYYMMDD
Sub-slab soil vapor sample	SV-1_YYYMMDD
Ambient air sample	AA-1_YYYYMMD
Indoor air sample	IA-1_YYYYMMDD

#### 4.9.2 Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sample preservative, if any
- Sampler's initials

Once the samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. All samples will be shipped to the laboratory at least twice per week. At the start and end of each workday, field personnel will add ice to the coolers as needed.

The samples will be prepared for shipment by placing each sample in a sealable plastic bag, then wrapping each container in bubble wrap to prevent breakage, adding freezer packs and/or fresh ice in sealable plastic bags and the chain-of-custody (COC) form. Tedlar<sup>®</sup> bags will be enclosed in a zip lock bag as an added protection prior to being placed in a cooler or shipment container without ice. SUMMA<sup>®</sup> canisters will also be placed into their appropriate shipment containers and do not require preservation with ice. All samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers and shipment containers shipped to the laboratory will be sealed with mailing tape and a COC seal to ensure that they remain sealed during delivery.

#### 4.9.3 Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on COC forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

#### 4.10 Field Instrumentation

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the site for referencing proper operation, maintenance and calibration procedures. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork, if applicable. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas.

#### 4.11 Data Review

In accordance with DER-10, each of the samples collected will undergo a third-party data review process to ensure the usability of the data collected. Data usability summary reports documenting any issues with QA/QC will be prepared and included in the Periodic Review Report (PRR). The resume for Lori Beyer of L.A.B. Validation Corp., the anticipated third-party data reviewer, is included in Attachment A.

#### 4.12 Reporting of Data

All data generated during the monitoring activities will be submitted in the appropriate Environmental Quality Information System (EQUIS<sup>™</sup>) Electronic Data Deliverable (EDD) format.

ATTACHMENT A Resumes of Key Project Personnel

# DEBORAH SHAPIRO, QEP

#### SENIOR VICE PRESIDENT

Deborah Shapiro is a Vice President in the Site Assessment and Remediation Department. Ms. Shapiro supervises project teams and manages all aspects of assessment and remediation projects across the New York Metropolitan Area. Ms. Shapiro works with developers, non-profit organizations, architects, local community groups, local businesses, and government agencies. Her projects fall under the regulatory oversight of NYSDEC, NYCDEP, and NYCOER including the New York State Brownfield Cleanup Program (BCP), New York City Voluntary Cleanup Program (VCP), NYSDEC petroleum spills program, RCRA/UIC closures, and NYCOER's E-designation program. Ms. Shapiro has also assisted commercial and industrial property owners with maintaining the integrity of their portfolios by providing compliance related cleanup and chemical storage management services. Ms. Shapiro has also been a moderator and panelist at numerous conferences.

Ms. Shapiro manages all aspects of redevelopment projects from the initial Phase I ESA, Phase II, and remediation through post-remedial site management. In addition, her experience includes groundwater investigations, monitoring, and sampling programs; Brownfield and hazardous waste site investigations; In-Situ Chemical Oxidation; underground storage tank studies, including soil contamination delineation, classification, removal and disposal; waste characterization sampling; exposure assessments; on-going remedial action (especially AS/SVE), and permitting.

#### BACKGROUND

#### Education

M.S., Environmental Science, American University, 2001 B.A., Environmental Studies, American University, 1998

#### Professional Licenses/Certifications

Qualified Environmental Professional Health and Safety Operations at Hazardous Materials Sites 29 CFR 1910.120 OSHA 8 Hour HAZWOPER Supervisor OSHA 10 Hour Occupational Construction Safety and Health CPR

#### Professional Memberships

Past President, New York City Brownfield Partnership Board Member, Residents for a More Beautiful Port Washington Member, Institute of Professional Environmental Practitioners (IPEP)

#### Awards

Big Apple Brownfield Award recipient as part of the Elton Crossing redevelopment team 2017 Big Apple Brownfield Award recipient as part of the Courtlandt Crescent redevelopment team 2013 Big Apple Brownfield Award recipient as part of the Via Verde redevelopment team 2012 Big Apple Brownfield Award recipient as part of the Cornerstone B1 (LaTerraza) redevelopment team 2011

#### Years of Experience

Year started in company: 2013 Year started in industry: 1998



### DEBORAH SHAPIRO, QEP

VICE PRESIDENT p. 2

#### **Relevant Experience**

#### Elton Crossing, Bronx, NY

AKRF provided environmental consulting services in connection with the purchase and redevelopment of the Elton Crossing site at 899 Elton Avenue in the Bronx, NY. The work initially involved the preparation of a Phase II subsurface investigation including soil and soil vapor testing to determine if the site would be eligible for the New York State Brownfield Cleanup Program (NYSBCP). Upon completion of the investigation, AKRF prepared a NYCBCP Application and the site was accepted into the NYSBCP. AKRF managed all aspects of the brownfield cleanup including; development of Investigation Work Plans, performing Remedial Investigations and Reports, preparation of Phase I ESAs, preparation of a Citizen Participation Plan, distribution of public notices, preparation and implementation of a Remedial Action Work Plan (RAWP), design of a sub-slab depressurization system, preparation of the Final Engineering Report and Site Management Plan, and sampling and management of soil disposal. AKRF is in the midst of implementing the Site Management Plan. As project manager, Ms. Shapiro was responsible for managing all technical components of the project, communication with NYSDEC and the Client, and managing the budget.

#### Second Farms, Bronx, NY

AKRF, Inc. was initially contracted by the New York City Office of Environmental Remediation (NYCOER) to conduct a subsurface investigation of a 1.12-acre parcel in the Bronx, New York under the United States Environmental Protection Agency (USEPA) Brownfield Assessment Grant program. The investigation included a geophysical survey and utility mark-outs, and the collection and analysis of soil, groundwater, soil vapor, indoor air and ambient air samples. AKRF continued working on the project for the developer by preparing a Remedial Action Plan and Environmental Assessment Statement. AKRF is in the midst of implementing the remedy.As project manager, Ms. Shapiro was responsible for managing all technical components of the project, communication with OER, NYCDEP, and the Client, and managing the budget.

#### Bradhurst Cornerstone II Residences, Manhattan, NY

AKRF, Inc. prepared a Part 58 Environmental Assessment and a City Environmental Quality Review Environmental Assessment Statement for the Bradhurst Cornerstone II Apartments project. Issues of concern for the environmental review included the identification of project commitments for certain of the four sites related to historic resources, hazardous materials, air quality, and building attenuation. As part of the mitigation of hazardous materials, AKRF conducted a Phase II investigation, and prepared a Remedial Action Plan and Construction Health and Safety Plan. As project manager, Ms. Shapiro was responsible for managing all technical components of the hazardous materials portion of the project, communication with the regulatory agency and the Client, and managing the budget.

#### Lambert Houses, Bronx, NY

AKRF performed an EIS of the Lambert Houses affordable housing complex located in the West Farms section of the Bronx, NY. Lambert Houses consisted of multi-story apartment buildings, parking garage, and a multitenant retail/commercial building alongside the elevated NYC subway. AKRF also conducted a Phase I ESA with a vapor intrusion screen of the Property to satisfy HUD's vapor intrusion requirements. The Phase I and vapor intrusion screens were prepared in accordance with ASTM E1527-05, ASTM E2600, and EPA's All Appropriate Inquiry (AAI) rule. After completion of the EIS, an E designation for hazardous materials was placed on the Site. A Subsurface Investigation was conducted and a Remedial Action Work Plan was prepared under OER oversight. The Site was subsequently entered in the NYC Voluntary Cleanup Program. AKRF is in the midst of implementing the RAWP, which included remediation of a hydraulic oil spill. As project manager, Ms. Shapiro was responsible for managing all technical components of the hazardous materials portion of the project, communication with the regulatory agency and the Client, and managing the budget.



### DEBORAH SHAPIRO, QEP

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#### Brook 156, Bronx, NY

AKRF was retained to provide environmental consulting services in connection with the purchase and development of the Site. AKRF prepared a Phase I Environmental Site Assessment (ESA) of the NYC-owned former gasoline service station and a former railroad. A Tier 1 Vapor Encroachment Screening was also conducted to satisfy HUD's vapor intrusion requirements. AKRF prepared a Remedial Investigation Work Plan (RIWP) and conducted a Remedial Investigation (RI) at the site, which included the collection and analysis of soil, soil vapor, and groundwater. The results of the RI, which were documented in a Remedial Investigation Report (RIR), were used to prepare a New York City Brownfield Cleanup Program (NYCBCP) application. The site was accepted into the New York State Brownfield Cleanup Program (NYSBCP). AKRF prepared a Citizen Participation Plan (CPP), distributed public notices, and conducted multiple Remedial Investigations to further investigate soil, soil vapor, and groundwater at the site prior to redevelopment. The results of the investigations were used to prepare a Remedial Action Work Plan (RAWP), which is undergoing review and approval by NYSDEC. The proposed remedy includes excavation of soil, design and installation of a soil vapor extraction system and sub-slab depressurization system. As project manager, Ms. Shapiro is responsible for managing all technical components of the project, communication with NYSDEC and the Client, and managing the budget.

# 20568 On-Call Environmental Consulting Services (Various Locations), New York City Mayor's Office of Environmental Remediation (OER) (administered by NYCEDC)

Ms. Shapiro is managing an on-call contract with the OER for brownfields environmental assessment and remediation. The work has included conducting Phase I environmental site assessments (ESAs) and multi-media sampling of soil, groundwater, and soil vapor for various sites funded by EPA grants. The work plans and investigation reports were completed in accordance with OER and EPA requirements. AKRF also implemented a remedial plan for capping a park site in Staten Island. In addition, AKRF provided support to OER and an affordable housing developer to expedite an application for entry into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), as well as preparation and implementation of the remedial investigation and remedial plan.

#### Atlantic Chestnut, Brooklyn, NY

AKRF was retained to provide environmental consulting services in connection with the purchase and redevelopment of former burned manufacturing buildings encompassing an entire city block in Brooklyn, New York. As part of due diligence, AKRF prepared a Phase I Environmental Site Assessment (ESA) Report for the property. After acquisition, the property was divided into three separate sites (3264 Fulton Street, 235 Chestnut Street, and 3301 Atlantic Avenue). AKRF prepared a Subsurface (Phase II) Investigation Work Plans and conducted Phase IIs at each of the sites, which included the collection and analysis of soil, soil vapor, and groundwater samples. Based on the results of the Phase IIs, which were documented in Subsurface (Phase II) Reports, New York State Brownfield Cleanup Program (NYSBCP) applications were prepared for each of the sites. After acceptance into the NYSBCP, AKRF prepared Citizen Participation Plans (CPPs) and distributed public notices. AKRF prepared Remedial Investigation (RI) Work Plans (RIWPs) and implemented numerous Remediation Investigations for each of the sites to further investigate contaminated media at the site prior to redevelopment, and prepared the RI Reports (RIRs). AKRF is in the midst of preparing Interim Remedial Work Plans for each Site, which include installation of a Soil Vapor Extraction to prevent the off-site migration of contaminants. As project manager, Ms. Shapiro was responsible for managing all technical components of the project, communication with NYSDEC and the Client, and managing the budget.



#### SENIOR VICE PRESIDENT

Michelle Lapin is a Senior Vice President with more than 30 years of experience in the assessment and remediation of hazardous waste issues. She leads the firm's Hazardous Materials group and offers extensive experience providing strategic planning and management for clients. Ms. Lapin has been responsible for the administration of technical solutions to contaminated soil, groundwater, air and geotechnical problems. Her other duties have included technical and report review, proposal writing, scheduling, budgeting, and acting as liaison between clients and regulatory agencies, and project coordination with federal, state, and local authorities.

Ms. Lapin's hydrogeologic experience includes groundwater investigations, formulation and administration of groundwater monitoring programs and remediation throughout the Northeast. Her experience with groundwater contamination includes Level B hazardous waste site investigations; leaking underground storage tank studies, including hazardous soil removal and disposal and associated soil and water issues; soil gas/vapor intrusion surveys; and wetlands issues. Ms. Lapin is experienced in coordinating and monitoring field programs concerning hazardous waste cell closures. She has directed hundreds of Phase I, Phase II, and Phase III investigations and remediations, many of them in conjunction with developers, law firms, lending institutions, and national retail chains. She is also experienced in the cleanup of contaminated properties under Brownfield Cleanup Program (BCP) and Voluntary Cleanup Program (VCP) regulations.

#### BACKGROUND

#### **Education**

M.S., Civil Engineering, Syracuse University, 1985 B.S., Civil Engineering, Clarkson University, 1983

#### Professional Licenses/Certifications

New York State P.E. State of Connecticut P.E.

#### Professional Memberships

Member, National Society of Professional Engineers (NSPE), National and CT Chapters Member, American Society of Civil Engineers (ASCE), National and CT Chapters Member, Connecticut Business & Industry Association (CBIA), CBIA Environmental Policies Council (EPC) Member, Environmental Professionals' Organization of Connecticut (EPOC) Board Member, New York City Brownfield Partnership Member, NAIOP, a Commercial Real Estate Development Association

#### Years of Experience

Year started in company: 1994 Year started in industry: 1986

#### **RELEVANT EXPERIENCE**

Memorial Sloan Kettering Cancer Center-CUNY 74th Street EIS, New York, NY



#### SENIOR VICE PRESIDENT p. 2

AKRF was engaged by Memorial Sloan-Kettering Cancer Center (MSK) and CUNY-Hunter College (CUNY) to prepare an EIS for a proposed joint facility located on a New York City-owned parcel located between East 73rd Street and East 74th Street adjacent to the FDR Drive in Manhattan. The proposed facility was formerly occupied by the Department of Sanitation, with over 41 underground storage tanks, will include an ambulatory medical care center for MSK and educational and medical research facilities for CUNY.

Ms. Lapin led the hazardous materials work, which included the preparation of the Phase I and II environmental site assessments, remedial action work plans (RAWPs), and construction health and safety plans (CHASPs) for submission to the New York City Office of Environmental Remediation (OER) for the Voluntary Cleanup Program (VCP) and to the New York State Department of Environmental Conservation (NYSDEC) for remediation of a petroleum spill. The RAWPs and CHASPs included provisions for excavation of contaminated soil and rock, removal of tanks and environmental monitoring during the construction activities. AKRF also performed a pre-demolition asbestos survey of the remaining concrete foundation structures and prepared specifications for asbestos abatement, soil management and underground storage tank removal and disposal.

The subgrade remediation was completed in compliance with the OER-approved RAWP and the spill was closed by the NYSDEC. The project has been completed, the spill was closed by the NYSDEC, and a Notice of Satisfaction was issued from the OER.

#### New York City Transit Hazardous Materials On-Call Contract, Various Locations, New York City, NY

As part of a five-year, \$10 million on-call environmental engineering and consulting services contract with MTA New York City Transit (NYCT), AKRF performed phase I Environmental Site Assessments (ESAs), asbestos, lead paint, indoor air quality and hazardous materials consulting services at various stations, tunnels and structures. Ms. Lapin oversaw the firm's team of technicians responsible for work at construction work sites occupied by multiple contractors and trades, monitoring contractor work practices, and inspection hazardous waste storage activities. She also reviewed AKRF's asbestos consulting services, coordinating the efforts of AKRF team members who conducted asbestos surveys and reporting, design services, and asbestos abatement oversight at manholes, stations, tunnels and other structures throughout New York.

#### Brooklyn Bridge Park, Brooklyn, NY

AKRF prepared an Environmental Impact Statement (EIS) and is continuing to provide technical and planning support services for Brooklyn Bridge Park, which revitalizing the 1.3-mile stretch of the East River waterfront between Jay Street on the north and Atlantic Avenue on the south. The new park, allows public access to the water's edge, allowing people to enjoy the spectacular views of the Manhattan skyline and New York Harbor. It also provides an array of passive and active recreational opportunities, including lawns, pavilions, and a marina. As with many waterfront sites around New York City, the lands along the Brooklyn waterfront have a long history of industrial activities. Some of these industries used dangerous chemicals and generated toxic by-products that could have entered the soil and groundwater. In addition, landfilling activities along the shoreline also used ash and other waste materials from industrial processes. Based on site inspections, historical maps, government records, and other sources, AKRF has been investigating the potential for the presence for hazardous materials in the park. This information was compiled into a Phase 1 Environmental Site Assessment report. AKRF has also provided and continues to support to the design team related to designing the project to minimize costs related to remediating hazardous materials where possible. Ms. Lapin is serving as senior manager for the hazardous materials investigations.

#### Columbia University Manhattanville Academic Mixed-Use Development, New York, NY

Ms. Lapin served as Hazardous Materials Task Leader on this Environmental Impact Statement (EIS) for approximately 4 million square feet of new academic, research and neighborhood uses to be constructed north of Columbia University's existing Morningside campus. The work included Phase I Environmental Site Assessments for the properties within the site boundaries, and estimates for a Subsurface (Phase II) Investigation of the entire



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development area. The firm's Hazardous Materials group performed over 30 individual Phase I Environmental Site Assessments for properties within the development area. In addition, a Preliminary Environmental Site Assessment (PESA) was completed in conjunction with the Environmental Impact Statement (EIS). Based on the Phase I studies, AKRF conducted a subsurface (Phase II) investigation in accordance with a New York City Department of Environmental Protection (NYCDEP) approved investigative work plan and health and safety plan. Subsurface activities included the advancement of soil borings, groundwater monitor wells, and the collection of soil and groundwater samples for laboratory analysis. This study was used to estimate costs to remediate contaminated soil and groundwater, and underground storage tanks and hazardous building materials, including lead-based paint and asbestos-containing materials.

#### Albert Einstein College of Medicine Center for Genetic and Translational Medicine, Bronx, NY

Ms. Lapin directed the firm's hazardous materials work in connection with the construction a new Center for Genetics and Translational Medicine (CGTM) building on the Bronx campus of the Albert Einstein College of Medicine of Yeshiva University. AKRF prepared an Environmental Assessment Statement (EAS) that examined such issues as land use, zoning, air quality, urban design and visual resources, hazardous materials, traffic, noise, and air quality. Ms. Lapin's work included analysis of the existing conditions and potential impacts that the construction could cause to the environment and human health.

#### West 61st Street Rezoning/Residential Development, New York, NY

Ms. Lapin directed the firm's hazardous materials work for this mixed-use development in Manhattan. The Algin Management Company hired AKRF to prepare an environmental impact statement (EIS) for the proposed rezoning of the western portion of the block between West 60th and 61st Streets, between Amsterdam and West End Avenues. The purpose of the proposed action was to facilitate the development of two 30-story residential towers with accessory parking spaces, and landscaped open space. The EIS examined a "worst case" condition for rezoning the block, which allowed Algin to build a residential building of approximately 375,000 square feet at their site. The building now contains 475 apartments, 200 accessory parking spaces, a health club, and community facility space. This site, with the services of AKRF, entered into New York State's Brownfield Cleanup Program (BCP). On-site issues included underground storage tanks remaining from previous on-site buildings, petroleum contamination from these tanks and possibly from off-site sources, and other soil contaminants (metals, semivolatile organic compounds, etc.) from fill materials and previous on-site buildings. AKRF oversaw the adherence to the Construction Health and Safety Plan (HASP), which was submitted to and approved by the New York State Department of Environmental Conservation (NYSDEC), and monitored the waste streams, to ensure that the different types of waste were disposed of at the correct receiving facilities. This oversight also included confirmation and characteristic soil sampling for the receiving facilities and NYSDEC. A "Track 1" Clean up of the majority of the property (the portion including the buildings) was completed and the final Engineering Report was approved by the NYSDEC. AKRF has also completed a smaller portion of the property as a "Track 4" cleanup, which includes a tennis court and landscaped areas. Ms. Lapin continues to manage the annual inspections for the property owner in accordance with the Brownfield Cleanup Agreement.

#### 2477 Third Avenue, Bronx, NY

AKRF conducted the investigation and remediation of the former 2477 Third Avenue gasoline station property under the New York State Department of Environmental Conservation's (NYSDEC's) Brownfield Cleanup Program (BCP). The work included shallow and deep aquifer groundwater testing, delineation of known areas of soil contamination, soil vapor analyses, and investigation and delineation of non-aqueous phase liquid (DNAPL) from past industrial activities. Upon NYSDEC approval of the Remedial Action Work Plan (RAWP), AKRF conducted the removal of the nine on-site underground storage tanks (USTs) and 1,100 tons of petroleumcontaminated soil, the application of six in-situ chemical oxidation (ISCO) groundwater treatments, and the implementation of four Enhanced Fluid Recovery (EFR) events to remove desorbed gasoline-related hydrocarbons in the groundwater. The site received a Certificate of Completion (COC) from the BCP in



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December 2015 and a Notice of Satisfaction (NOS) in October 2016 from the Mayor's Office of Environmental Remediation (OER) in connection with the hazardous materials E-Designation assigned to the property. Ms. Lapin was the professional engineer of record, responsible for the remediation design elements and overall adherence to the NYSDEC and New York City Office of Environmental Remediation (OER) regulations.

#### Larkin Plaza, Yonkers, NY - Remedial Investigation, Construction Oversight

AKRF assisted RXR Realty with enrolling the 1.1-acre Larkin Plaza site in the New York State Department of Environmental Conservation's (NYSDEC's) Brownfield Cleanup Program (BCP). Since being accepted into the program, AKRF conducted an extensive remedial investigation, prepared the necessary remedial action plans, managed the citizen participation tasks, and is in the process of conducting the remediation in conjunction with NYSDEC oversight. To date, the remedial work has included in-situ chemical oxidation (ISCO) treatments, contaminated soil removal, and petroleum product recovery. AKRF also assisted RXR with various construction-related services, including dewatering discharge permitting, soil disposal characterization testing, and storm water pollution prevention plan (SWPPP) preparation. AKRF's Cultural Resources department is in the process of preparing a submission to the State Historic Preservation Office (SHPO) on behalf of RXR related to the acquisition of additional public funding sources for the construction project. A Certificate of Completion (COC) from the NYSDEC is anticipated at the end of 2018. Ms. Lapin is the professional engineer of record, responsible for the remediation design elements and adherence to the NYSDEC-approved work plans and remediation design.

#### NY Wheel, Staten Island, NY

Working with the New York City Department of Small Business Services (SBS) as lead agency, AKRF conducted an environmental review for the forthcoming Empire Outlets and New York Observation Wheel (NY Wheel), a mixed-use development situated on a State Voluntary Cleanup Program (VCP) site managed by the New York City Economic Development Corporation (EDC), on the northern Staten Island waterfront. AKRF provided an EIS analyzing the combined project. In addition, AKRF prepared an updated Site Management Plan (SMP) reflecting the proposed development for the VCP site. The SMP was approved by the New York State Department of Environmental Conservation (NYSDEC) in March 2015.

Hazardous materials services provided by AKRF for New York Wheel LLC during construction on the NY Wheel site include environmental construction oversight, inspection and documentation of SSDS installation, soil sampling, and reporting to ensure compliance with the SMP, storm water pollution prevention plan (SWPPP) inspections, and site design services. AKRF's work entails regular coordination with EDC for reporting to NYSDEC, modifications to the SMP, etc. Ms. Lapin is the professional engineer of record, responsible for adherence to the NYSDEC-approved plans and coordination with the NYSDEC regarding the design elements.

#### 443 Greenwich Street, Manhattan, NY

This Site was assigned an E-Designation for hazardous materials (as well as air quality and noise) during the North Tribeca Rezoning in 2010, which requires environmental testing and, if necessary, remediation to the satisfaction of the New York City Mayor's Office of Environmental Remediation (OER). After years of public opposition to the original redevelopment scheme calling for a boutique hotel, this former manufacturing building and its current developer gained acceptance through the Department of City Planning and the Landmarks Preservation Commission to move forward with redevelopment as residential lofts. The redevelopment process began in 2012 and led to initial re-occupancy in 2016 after overcoming several regulatory challenges while seeking LEED® certification.

Once trichloroethene (TCE) was identified on-site, the typically straight forward assignment of delineating contaminant sources for AKRF became much more complex following the identification of an off-site TCE groundwater plume. Based on the completion of several rounds of additional sampling and investigation activities including a compound specific isotopic analysis (CSIA) of the chlorinated volatile organic compounds (VOCs) detected in the central portion of the Site and the off-site monitor wells south of the Site, the presence of two



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separate releases (one originating on-site and one originating off-site) of TCE was confirmed. Based on the confirmation that the Site was not the contamination source associated with the off-site plume, the redevelopment of the Site proceeded under the review of the OER, and did not require direct or continued oversight from the New York State Department of Environmental Conservation (NYSDEC). Furthermore, the developer of the Site, who had become the owner, was not deemed responsible to complete additional off-site investigation or remediation associated with the separate, off-site TCE groundwater plume.

For this project, AKRF utilized forensic-based analysis of chlorinated VOC plumes and was one of the first projects that included a groundwater treatment technology managed by the OER in its E-Designation program. The Site also includes an engineered cap to prevent exposure to underlying soil/fill, a vapor barrier/waterproofing system beneath the building slab and along foundation sidewalls, and the operation of an active sub-slab depressurization (SSD) system. The project was awarded the 2017 Environmental Protection award by the New York City Brownfield Partnership. Ms. Lapin was the professional engineer of record, responsible for the remediation design and adherence of the remediation and remediation systems installation and ongoing operation.

#### Hudson River Park, New York, NY

Ms. Lapin is directing AKRF's hazardous materials work during construction of Hudson River Park, a five-mile linear park along Manhattan's West Side. As the Hudson River Park Trust's (HRPT's) environmental consultant, AKRF has overseen preparation and implementation of additional soil and groundwater investigations [working with both the New York State Department of Environmental Conservation (NYSDEC) and the New York City Department of Environmental Protection (NYCDEP)], all health and safety activities, and removal of both known underground storage tanks and those encountered during construction. Previously, the firm performed hazardous materials assessments as part of the Environmental Impact Statement (EIS) process, including extensive database and historical research, and soil and groundwater investigations. Ms. Lapin has been the senior consultant for the soil and groundwater investigations and remediation, and the asbestos investigations and abatement oversight.

#### Roosevelt Union Free School District - District-wide Improvement Program, Roosevelt, NY

Ms. Lapin managed the hazardous materials investigation for the Draft and Final Environmental Impact Statements (EIS) for the improvement program, which included the demolition of three existing elementary schools and portions of the junior-senior high school, and the reconstruction of three replacement elementary schools, a separate replacement middle school, and renovations to the high school. Following the EIS, additional hazardous materials investigations were completed, including comprehensive asbestos and lead surveys; Phase I and Phase II Environmental Site Assessments; the preparation of asbestos, lead, hazardous materials and demolition specifications; and obtaining site-specific variances from the New York State Department of Labor (NYSDOL). The middle school remediation was conducted through coordination with the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the New York State Education Department (NYSED) and the local school district. The project was approved, and construction/renovation for the new middle school completed such that the school opened for the Fall 2008 semester as planned.

#### Fiterman Hall Deconstruction and Decontamination Project, New York, NY

The 15-story Fiterman Hall building, located at 30 West Broadway between Barclay and Murray Streets, originally constructed as an office building in the 1950s, had served as an extension of the City University of New York (CUNY) Borough of Manhattan Community College (BMCC) since 1993. The building was severely damaged during the September 11, 2001, attack on the World Trade Center (WTC) when 7 WTC collapsed and struck the south façade of the building, resulting in the partial collapse of the southwest corner of the structure. The building was subsequently stabilized, with breaches closed and major debris removed, however, extensive mold and WTC dust contaminants remain within the building, which must be taken down. The project required the preparation of two Environmental Assessment Statements (EASs) for the redevelopment of Fiterman Hall—one for the deconstruction and decontamination of the building and one for the construction of a replacement building on the



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site. AKRF prepared the EAS for the Deconstruction and Decontamination project, which included the decontamination of the interior and exterior of the building, the removal and disposal of all building contents, and the deconstruction of the existing, approximately 377,000-gross-square-foot partially collapsed structure. Ms. Lapin reviewed the deconstruction and decontamination plans for the EAS. The cleanup plan was submitted to the United States Environmental Protection Agency (USEPA).

#### Yonkers Waterfront Redevelopment Project, Yonkers, NY

For this redevelopment along Yonkers' Hudson River waterfront, Ms. Lapin headed the remedial investigation and remediation work that included Phase I Environmental Site Assessments of 12 parcels, investigations of underground storage tank removals and associated soil remediation, remedial alternatives reports, and remedial work plans for multiple parcels. Several of the city-owned parcels were remediated under a Voluntary Cleanup Agreement; others were administered with state Brownfields grants. Hazardous waste remediation was completed on both brownfield and voluntary clean-up parcels, which enabled construction of mixed-use retail, residential development, and parking.

#### Davids Island Site Investigations, New Rochelle, NY

Ms. Lapin managed the hazardous materials investigation of Davids Island, the largest undeveloped island on the Long Island Sound in Westchester County. The 80-acre island features pre- and post-Civil War military buildings and parade grounds, and is viewed as a major heritage, tourism, and recreational amenity. The island, formerly known as Fort Slocum, was used by the U.S. military, beginning in the 19th century, as an Army base, hospital, and training center. The island was planned for county park purposes. The investigation included a Phase I Environmental Site Assessment, with historical research going back to the 17th century, a Phase II (Subsurface) Investigation, underground storage tank investigations, asbestos surveys, and conditions surveys of all remaining structures. Cost estimates were submitted to Westchester County for soil remediation, asbestos abatement, and building demolition.

#### Site Selection and Installation of 11 Turbine Generators, New York and Long Island, NY

AKRF was retained by the New York Power Authority (NYPA) to assist in the State Environmental Quality Review Act (SEQRA) review of the proposed siting, construction, and operation of 11 single-cycle gas turbine generators in the New York metropolitan area. Ms. Lapin managed the hazardous materials investigation of the sites. The work has included Phase I Environmental Site Assessments, subsurface investigations, and construction health and safety plans.

#### Cross Westchester (I-287) Expressway Phases V and VI, Westchester County, NY

For the New York State Department of Transportation's (NYSDOT) I-287 reconstruction project, Ms. Lapin served as Project Manager and was responsible for directing the contaminated materials aspect of the final design effort for the reconstruction of Westchester County's major east-west artery. As part of her duties, Ms. Lapin managed the asbestos investigations at eight bridges and wetland delineation along the entire corridor and wrote the scope of work and provided general management of the project.

#### Supermarket Redevelopment, New Fairfield, CT

AKRF provided consulting services to the developer and owner of a nine-acre site, including conducting a remedial investigation and remediation of a site contaminated from former dry cleaning operations and off-site gasoline spills. The investigation included the installation of monitoring wells in three distinct aquifers, geophysical logging, pump tests, and associated data analysis. Ms. Lapin presented the environmental issues and planned remediation to local and state officials during the early stages of the planning process to incorporate their comments into the final remedial design. A remedial action work plan (RAWP) was completed and approved by the Connecticut Department of Environmental Protection (CTDEP) within a year to enable redevelopment work for a new supermarket and shopping center. The RAWP included the remediation of soil within the source area



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and a multi-well pump and treat system for the recovery of non-aqueous and dissolved phase contamination in groundwater. The design of the recovery well system included extensive groundwater modeling to ensure capture of the contaminant plume and the appropriate quantity and spacing of the wells. Ms. Lapin directed the soil removal remedial activities and monitoring for additional potential contamination during construction. In addition, AKRF performed comprehensive pre-demolition asbestos and lead-based paint surveys of the former site structures, conducted abatement, air monitoring and oversight, and provided environmental consulting support for the development of the site. The groundwater remediation system was installed during site development and began operation once development was complete.

#### Broad Street, Stamford, CT [former Project name: Target Stamford)

AKRF originally completed a Phase I Environmental Site Assessment (ESA) for a developer of this property, located at southeastern corner of Broad Street and Washington Boulevard in downtown Stamford, Connecticut, for a proposed residential development. Four years later, an update of this Phase I ESA was conducted for a proposed Target retail development. The study area included the current Target site and the west-adjacent site which was subsequently developed as a luxury residential tower. Following the Phase I report, a subsurface (Phase II) investigation was conducted, which included soil borings, groundwater monitor wells, soil and groundwater sample collection and analysis. The results of the Phase II investigation were used to develop a remediation strategy. An additional Phase I/Phase II investigation was conducted of the adjacent former transmission repair facility, which included a site inspection, review of local and state records, an underground storage tank markout survey, advancement of soil borings, and collection of soil samples for laboratory analysis. AKRF also conducted asbestos surveys prior to abatement and demolition of the former Broad Street and Washington Boulevard buildings.

#### EPA Brownfields Assessment Program, Naugatuck, CT

Ms. Lapin is currently serving as the Principal-in-Charge for a USEPA Brownfields Assessment program project in Naugatuck, Connecticut. She is overseeing the assessment and investigation of key development parcels, including Work Plan and QAPP preparation, and conducting community outreach tasks to communicate site risks and the project process. Mr. Stefaniak plays the lead role in administering the USEPA Cooperative Agreement on behalf of the Borough.

#### East 75th/East 76th Street Site, New York, NY

Ms. Lapin served as Senior Manager for this project that encompassed coordination and direct remediation efforts of this former dry cleaning facility and parking garage prior to the sale of the property and its ultimate redevelopment for use as a private school. A preliminary site investigation identified 20 current and former petroleum and solvent tanks on the property. A soil and groundwater testing program was designed and implemented to identify the presence and extent of contamination resulting from potential tank spills. This investigation confirmed the presence of subsurface petroleum contamination in the soil and solvent contamination from former dry cleaning activities in the bedrock. AKRF completed oversight of the remediation under the State's Voluntary Cleanup Program. Remediation, consisting of tank removals and excavation of contaminated soil and the removal of solvent-contaminated bedrock down to 30 feet below grade, has been completed. AKRF completed oversight of the pre-treatment of groundwater prior to discharge to the municipal sewer system and an off-site study to determine impacts to groundwater in downgradient locations.

#### Former Macy's Site, White Plains, NY

While assisting Tishman Speyer with plans to redevelop this site, Ms. Lapin managed the pre-demolition work, which included a Phase I site assessment; subsurface investigation (Phase II), including the analysis of soil and groundwater samples for contamination; a comprehensive asbestos, lead paint, and PCB investigation; radon analysis; and coordination and oversight of the removal of hazardous materials left within the building by previous



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tenants. Work also included asbestos abatement specifications and specifications for the removal of two 10,000-gallon vaulted fuel-oil underground storage tanks.

#### Storage Deluxe, Various Locations, NY

Ms. Lapin manages the firm's ongoing work with Storage Deluxe, which includes Phase I Environmental Site Assessments and Phase II Subsurface Investigations, underground storage tank removals and associated remediation, asbestos surveys and abatement oversight, and contaminated soil removal and remediation for sites in Connecticut, the Bronx, Brooklyn, Manhattan, Westchester County, and Long Island.

#### Home Depot, Various Locations, NY and CT

Ms. Lapin, serving as either Project Manager or Senior Manager, has managed the investigations and remediation at multiple Home Depot sites in the five boroughs, Long Island, and Connecticut. The investigations have included Phase I, II, and III site assessments, asbestos and lead paint surveys, abatement specifications and oversight, and soil and groundwater remediation.

#### Avalon on the Sound, New Rochelle, NY

For Avalon Bay Communities, Ms. Lapin managed the investigations and remediation of two phases of this residential development, including two luxury residential towers and an associated parking garage. Remediation of the first phase of development (the first residential tower and the parking garage) included gasoline contamination from a former taxi facility, fuel oil contamination from multiple residential underground storage tanks, and chemical contamination from former on-site manufacturing facilities. The remediation and closure of the tank spills was coordinated with the New York State Department of Environmental Conservation (NYSDEC). The initial investigation of the Phase II development—an additional high-rise luxury residential building—detected petroleum contamination. A second investigation was conducted to delineate the extent of the contamination and estimate the costs for remediation. AKRF oversaw the remediation and conducted the Health and Safety monitoring. The remediation was completed with closure and approvals of the NYSDEC.

#### Mill Basin, Gerritsen Inlet, and Paerdegat Basin Bridges, Final Design, Shore Parkway, Brooklyn, NY

Following the preparation of the Generic Environmental Impact Statement (GEIS) for the Belt Parkway Bridges Project, the firm was retained for supplemental work during the final design phase of the project. This included National Environmental Policy Act (NEPA) and State Environmental Quality Review Act (SEQRA) documentation for three of the bridges—Mill Basin, Gerritsen Inlet, and Paerdegat Basin—which will be federally funded. Ms. Lapin managed the contaminated materials investigation that included a detailed subsurface contaminated materials assessment, both subaqueous and along the upland approaches.

#### NYSDOT Transportation Management Center (TMC), Hawthorne, NY

AKRF conducted environmental studies for the New York State Department of Transportation (NYSDOT) at the current troopers' headquarters in Hawthorne, NY. The property is the proposed site of a new Transportation Management Center. AKRF completed a comprehensive asbestos survey of the on-site building and prepared asbestos abatement specifications; performed a Phase I site assessment; conducted an electromagnetic (EM) survey that located two fuel oil underground storage tanks, and developed removal specifications for the two underground storage tanks.

# Metro-North Railroad Poughkeepsie Intermodal Station/Parking Improvement Project, Poughkeepsie, NY

Ms. Lapin served as Project Manager of the hazardous materials investigation in connection with AKRF's provision of planning and environmental services for parking improvement projects at this station along the Hudson Line. The project included an approximately 600-space garage, additional surface parking, and an intermodal station to facilitate bus, taxi, and kiss-and-ride movements. Ms. Lapin conducted Phase I and II



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contaminated materials assessments and worked with the archaeologists to locate an historical roundhouse/turntable.

#### Metro-North Railroad Golden's Bridge Station Parking Project, Westchester County, New York

For Metro-North Railroad, Ms. Lapin managed a Phase I Environmental Site Assessment of a property that has since become the new parking area, used by the existing Golden's Bridge train station. Ms. Lapin also conducted a subsurface (Phase II) investigation of the original parking area, track area, and existing platform for the potential impact of moving tracks in the siding area to extend the existing parking area and adding an access from a proposed overhead walkway (connecting the train station to the new parking area over a highway). The study also included an assessment for lead-based paint and asbestos on the platform structures.

#### East River Science Park, New York, NY

Originally, New York University School of Medicine (NYUSOM) retained the firm to prepare a full Environmental Impact Statement (EIS) for its proposed East River Science Park (ERSP). The proposed complex was to occupy an underutilized portion of the Bellevue Hospital campus between East 30th Street and approximately East 28th Street, immediately south of NYU's campus. As originally contemplated, Phase I was to include 618,000 square feet of development, including a clinical practice and research building, a biotech center, 220 housing units for post-doctorate staff, a child care center, and a conference center. This phase would include reuse of the former Bellevue Psychiatric Building, a historic structure on East 30th Street east of First Avenue. Phase II was to include a second biotech building with a library to serve NYU and Bellevue at the eastern end of the block between 29th and 30th Streets. Phase III was to include a third biotech building and parking. The project's EIS considered a full range of issues, including land use, socioeconomics, shadows, historic resources, open space, traffic and transportation, air quality, noise, and construction. The firm also prepared all of the traffic and transportation studies for the urban design and master planning efforts. Ms. Lapin managed the Phase I Environmental Site Assessment and other hazardous materials-related issues.

Events relating to September 11, 2001 put a hold on the project for a number of years. When the project resurfaced, it had a new developer and a decreased scope. Ms. Lapin updated the hazardous materials issues for the new developer and consulted with them regarding remediation strategies and involvement of regulatory agencies. For the actual remediation/development, the city requested oversight by AKRF to represent its interests (the city is retaining ownership of the land). Ms. Lapin completed directing the remediation oversight on behalf of the City of New York for the remediation of the former psychiatric hospital building, laundry building and parking areas associated with Bellevue Hospital. The new development includes a biotechnology center (Commercial Life Science Research and Office Park) comprising two buildings (combined 550,000 square feet), street level retail, and an elevated plaza.

#### 68, 76 and 78 Forest Street and 96-98 Grove Street, Stamford, CT

Ms. Lapin led this project, for which AKRF was retained to complete a Phase I Environmental Site Assessment (ESA) of five residential properties, and asbestos surveys and lead-based paint surveys of the five multi-family residential structures prior to a real estate transaction. The investigations were completed to allow demolition of the residential structures and prepare the properties for development into the Highgrove high rise condominium complex. AKRF represented the purchaser and site developer during the due diligence process, identified areas of environmental concern, and completed underground storage tank closure activities prior to initiating site development. In addition, AKRF conducted a Phase I ESA of a property on Summer Street that was being used by the developer as a "temporary" office building and a parking area utilized as a sales center and apartment model for the Highgrove residential development.

#### Shelton Storage Deluxe, Shelton, CT

AKRF completed Phase I, Phase II and Tank Removal/Remediation services for a storage facility in Shelton, Connecticut. Based on this information from the Phase I ESA, AKRF conducted a Phase II study that revealed



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groundwater impact (gasoline), possibly from an off-site source. Additional testing was then conducted to determine the source of the gasoline contamination. Testing of a wood block floor revealed concentrations of volatile and semivolatile organic compounds and total petroleum hydrocarbons; therefore, disposal of this material had to be as a petroleum-contaminated waste. The additional testing included upstream and downstream surface water samples, and on-site detention pond water and sediment samples. Subsequent to the Phase II testing, a 4,000-gallon on-site underground storage tank was removed. Upon removal, contaminated soil and groundwater were observed and a spill was called into the Connecticut Department of Environmental Protection (CTDEP). Following completion of remedial activities and submission of a closure report, the spill was closed by the CTDEP. Ms. Lapin directed the firm's efforts to complete this project.

#### DPR Soundview Park Playgrounds and Open Space, Bronx, NY

AKRF is part of a team working on the reconstruction of this 212-acre NYCDPR public park located along the Bronx River in the Bronx, New York. The park was identified as an underutilized park and is being improved in accordance with the goals of PlaNYC. Ms. Lapin is overseeing AKRF's hazardous materials investigations including environmental and remediation-related work. AKRF prepared the Environmental Assessment Statement (EAS) and the project has moved into the design and construction phase. The remediation/construction of multiple phases of the development is currently underway.

#### 164 Kent Avenue, Brooklyn, NY (AKA Northside Piers and 1 North 4th Place)

The project was a multi-phase development consisting of a large waterfront block in the Williamsburg Rezoning Area. The project site has been developed with a mixed-use residential-commercial high rise towers with an esplanade and a pier along the East River. AKRF provided acquisition and development support, including performing Phase I and II environmental site assessments, and preparation of Remedial Action Plans (RAPs) and Construction Health and Safety Plan (CHASPs) for approval by DEP and OER. AKRF provided assistance with construction oversight during soil handling activities and managing the Community Air Monitoring Plan (CAMP) activities. To date, closure reports have been prepared and occupancy achieved for three of the four buildings. Ms. Lapin is the Professional Engineer (P.E.) of record for the DEP and OER RAPs, CHASPs and Remedial Closure Reports (RCRs).

#### Rego Park Home Depot, Queens, NY

Solvent contamination was encountered during retail development of a former industrial property in Rego Park, Queens, New York. The site work included an extensive investigation and a multi-phase remediation performed under the NYSDEC Voluntary Cleanup Program (BCP). Remediation included removal of aboveground and underground storage tanks (ASTs and USTs) and hotspot soil removal. An Air Sparging/Soil Vapor Extraction (AS/SVE) groundwater remediation system designed by AKRF was installed as part of the building construction. Continued remediation work included upgrading and expanding the AS/SVE system after the store was opened. AKRF prepared the Final Engineering Report and obtained closure with a Release and Covenant Not to Sue issued by NYSDEC in 2013. AKRF continues operations, maintenance, and monitoring under the NYSDECapproved Site Management Plan. Ms. Lapin is the Professional Engineer (P.E.) of record for the remediation design and implementation in accordance with the NYSDEC Brownfield Cleanup Program (BCP).

#### 250 North 10th Street, LLC., Residential Redevelopment Site, Brooklyn, NY

AKRF was retained to investigate and remediate this former industrial property in the Williamsburg section of Brooklyn, New York in connection with site redevelopment. The site is approximately 50,000 square feet, and redevelopment included a six story residential building and parking garage. The work was completed to satisfy the requirements of the NYC E-designation Program and NYC Voluntary Cleanup Program (NYC VCP). AKRF completed a Remedial Investigation (RI) to evaluate the nature and extent of site contamination, and developed a Remedial Action Work Plan (RAWP) to properly address site contamination during redevelopment. Remediation included removal of underground storage tanks, more than 7,500 tons of contaminated soil, and installation of a



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vapor barrier and site cap across the entire property. The remediation was completed under oversight of the NYC Office of Environmental Remediation (OER), and in a manner that has rendered the Site protective of public health and the environment consistent with residential use of the property. Ms. Lapin is the Professional Engineer (P.E.) of record for the remedial effort in accordance with the OER Voluntary Cleanup Program (VCP).

#### AP-Williamsburg, LLC, 50 North 5th Street Development, Brooklyn, NY

AKRF directed the remedial program at a 55,000-square foot site located in the Williamsburg section of Brooklyn, New York. The site had an industrial and manufacturing history for over 100 years that included a barrel making factory, use of kilns, and a carpet and flooring materials warehouse. AKRF completed a Remedial Investigation (RI) to evaluate the nature and extent of site contamination, and developed a Remedial Action Work Plan (RAWP) to properly address site contamination during redevelopment. Remediation included removal of more than 5,000 tons of contaminated soil, and installation of a vapor barrier and sub-slab depressurization system (SSDS) beneath the site building. The remediation was completed in a manner that has rendered the Site protective of public health and the environment consistent with commercial and residential use of the property, and in accordance with the requirements of the NYC OER E-designation program. The site includes a seven story residential apartment building with street level retail space and a parking garage. Ms. Lapin is the Professional Engineer (P.E.) of record for the NYC OER RAWP and Remedial Closure Report (RCR).

# New York City School Construction Authority (NYCSCA), Environmental Consulting Hazardous Materials Services

AKRF has undertaken various assignments under consecutive hazardous materials on-call contracts, including environmental assessment, remedial design, and plumbing disinfection consulting tasks. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments (ESAs) and multi-media subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plans, design of sub-slab depressurization systems (SSDS) and contract specifications, and construction oversight. The work has also included conducting Phase I ESAs and indoor air quality testing, preparation of specifications, supervision of storage tank removals, and investigation and remediation of spills for existing schools. Due to the sensitivity of school sites, work under this contract is often conducted on short notice and during non-school hours. Ms. Lapin is the QA/QC officer for all of the SCA hazardous materials assignments and the Professional Engineer (P.E.) of record for the various remediation systems, including SSDS. In addition, Ms. Lapin is also the QA/QC officer for the lead in drinking water and plumbing disinfection tasks also under AKRF's on-call hazardous materials consulting contract with the NYCSCA. AKRF performed lead in drinking water sampling in about 160 schools during two three-month periods in 2016 and 2017 and continues to provide lead sampling, reporting, and recommendations as new plumbing is installed. AKRF also oversees plumbing disinfection work, which is required prior to new plumbing being placed into service. The assignments involve reviewing and commenting on disinfection plans, supervision of the disinfection and confirmation testing, and preparation of reports documenting that the work was conducted in accordance with the specifications and applicable requirements. As with the Phase I/II studies, work under the lead testing and plumbing disinfection contract is often conducted on short notice during non-school hours.



# J. PATRICK DIGGINS, P.G.

#### **Technical Director**

Patrick Diggins has 11 years of environmental consulting experience in site investigation and remediation practice. His experience includes implementing Phase I Environmental Site Assessments, Subsurface (Phase II) Investigations, and Remedial Investigations; and developing and managing remedial action programs including soil excavation, remediation system design and installation, regulatory reporting, and post-remedial site management. Several of his New York City (NYC) projects have been successfully investigated and/or remediated under either the New York State Department of Environmental Conservation (NYSDEC) Brownfield, or NYC Office of Environmental Remediation (OER) (E) Designation or Voluntary Cleanup Programs (VCP). Prior to his work in New York City, he gained experience in the New England region implementing large-scale environmental investigation and groundwater remediation projects.

#### BACKGROUND

#### Education

M.S. Hydrogeology, University of Massachusetts - Amherst, 2009 B.S Geology, Beloit College, 2005

#### Certifications

New York State Certified Professional Geologist, NY – License No. 000288 OSHA 40 Hour HAZWOPER OSHA 8 Hour Refresher

#### **Professional Memberships**

Member, American Institute for Professional Geologists (AIPG), 2018 – Present Member, New York State Council of Professional Geologists (NYSCPG), 2016 – Present

#### Years of Experience

Year started at AKRF: 2016 Year started in the Industry: 2008

### **RELEVANT EXPERIENCE**

#### Former Budweiser Facility, Long Island City, New York

AKRF was initially tasked with completion of Phase I Environmental Site Assessment (ESA), and implementation of a Subsurface (Phase II) Investigation and Groundwater Elevation Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the Phase I ESA site reconnaissance and the subsurface investigation, as well as completing reports for delivery to the client. AKRF is now assisting the client with navigating City and State environmental regulators in preparation for remediation during redevelopment.

#### DOT Relocation Site, Long Island City, New York

AKRF was initially tasked with completion of Phase I ESA and implementation of a Subsurface (Phase II) Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the Phase I ESA site reconnaissance and the subsurface investigation, as well as completing reports for delivery to the client. AKRF has now assisted the client with entering the proposed site redevelopment project into the New York State Brownfield Cleanup Program (BCP), completed a Remedial Investigation, and is preparing a Remedial Action Work Plan (RAWP). Mr. Diggins will work with NYSDEC and the property owner to obtain approval for and then implement the RAWP.

#### Queens Animal Shelter, Ridgewood, Queens, New York

AKRF was initially tasked with implementation of a Subsurface (Phase II) Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the subsurface investigation, as well as completing reports for delivery to the client. AKRF has now assisted the client with entering the proposed site redevelopment project into the New York State BCP. The RAWP is complete and remediation and redevelopment began in December 2019. Mr. Diggins has managed implementation of the remedy, which is ongoing at the Site.



#### 272 4th Avenue, Brooklyn

AKRF was tasked with completion of Phase I ESA and implementation of a Subsurface (Phase II) Investigation. Mr. Diggins acted as project manager, overseeing field personnel implementing the Phase I ESA site reconnaissance and the subsurface investigation, as well as completing reports for delivery to the client. Based on the results of the investigation, AKRF assisted the client with entering the proposed site redevelopment project into the New York State BCP, and submitted a Remedial Investigation Work Plan (RIWP), which was recently approved by NYSDEC.

#### 1325 Jerome Avenue, Bronx, NY

The property is a New York City Mayor's Office of Environmental Remediation (NYC OER) (E) Designation site. AKRF performed the Remedial Investigation; prepared and received approval for the RAWP by the NYC OER and the NYSDEC Spills Project Manager, and is overseeing the successful implementation of remedial actions during redevelopment, which are ongoing. For this project, Mr. Diggins acted as project manager, overseeing field personnel, reviewing daily reports, coordinating with property owner, and regulators.

#### 110-10 Astoria Boulevard (419Q), Queens, NY

The property is a future public school, and is enrolled in NYC OER (E) Designation program. AKRF is representing the New York City School Construction Authority (NYC SCA) and has performed the remedial investigation; developed remedial work plans for approval by the NYC OER, and is currently overseeing the implementation of remedial actions. For this project, Mr. Diggins is acting as project manager, overseeing field personnel and reviewing daily reports.

#### 2581 Adam Clayton Powell Jr. Blvd (M010), New York, NY

The property is a Metropolitan Transit Authority (MTA) station with a NYC public school (Frederick Douglass Academy) constructed on a platform above. A petroleum spill was identified in the train station that appeared to have originated from within the school. AKRF represented NYC SCA and worked with MTA to investigate and remediate the spill.

#### 11 Greene Street, New York, NY

The property is a NYC OER Voluntary Cleanup Program (VCP) site. AKRF performed the remedial investigation; developed remedial work plans for approval by the NYC OER, and oversaw the successful implementation of remedial actions during redevelopment. For this project, Mr. Diggins acted as project manager, overseeing field personnel, reviewing daily reports, coordinating with property owner and NYC OER. The remedial actions are complete and the building is expected to open in 2020.

#### East Side Coastal Resiliency, East River Waterfront/Lower Manhattan, New York

Mr. Diggins prepared cost estimates for construction of coastal resiliency structures in potentially contaminated areas of the East River waterfront, on behalf of NYC Department of Design and Construction (DDC). He evaluated field and laboratory data to assist the project manager in the report preparation, and represented AKRF at meetings with city officials.

#### 29-39 East Fordham Road, Bronx, NY

The property has undergone remediation of a petroleum spill that originated in the facility basement. AKRF performed the spill investigation, developed remedial work plans for approval by the NYSDEC, and oversaw the implementation of remedial actions. For this project, Mr. Diggins acted as project manager overseeing field personnel and guiding the client over the regulatory hurdles.


## **MICHAEL BATES**

#### **GEOLOGIST – SITE ASSESSMENT AND REMEDIATION**

Michael Bates is a Geologist/Environmental Professional II in AKRF's Site Assessment and Remediation group, with experience in environmental sampling and monitoring during site remediation, subsurface and vapor intrusion investigations, remediation system operation and maintenance, and technical reporting.

## BACKGROUND

<u>Role in Project</u> Junior Environmental Scientist

## **EDUCATION**

B.A. Geology, SUNY Geneseo, May 2017

## CERTIFICATIONS

OSHA 40-hour Hazardous Waste Operations and Emergency Response Training OSHA 30-hour Construction Safety Training EPA Lead Risk Assessor NY Certified Asbestos Inspector

## YEARS OF EXPERIENCE

2 years in the industry

6 months with AKRF

## **RELEVANT EXPERIENCE**

## New York City School Construction Authority On-Call Contracts for Environmental Consulting Services, Various Sites, NY

AKRF has undertaken various assignments under five consecutive hazardous materials on-call contracts, including environmental assessment, remedial design, construction support, plumbing disinfection, and potable water (lead) sampling consulting tasks. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments, and subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plans, design of sub-slab depressurization systems and contract specifications, and construction oversight. The work also includes conducting indoor air quality testing, vapor intrusion assessments, preparation of specifications and construction management for petroleum storage tank removals, and investigation and remediation of spills for existing schools. Under the most recent contract, Michael Bates has completed waste characterization sampling for planned improvements at an existing school facility (K597) and conducted environmental oversight and community air monitoring during construction of a new school facility (X468).

## **Michael Bates**

P. 2

#### Phipps Houses, Atlantic Chestnut, Brooklyn, NY

AKRF was retained to provide environmental consulting services in connection with the purchase and redevelopment of former burned manufacturing buildings encompassing an entire city block in Brooklyn, New York. AKRF conducted due diligence prior to acquisition, and facilitated entry into the New York State Brownfield Cleanup Program (NYSBCP) to delineate contamination in soil, groundwater, and soil vapor; and remediate the lots during redevelopment. AKRF designed and implemented several rounds of investigations and remedies. The first phase of the project received NYSDEC sign off in 2022 and the second phase of the project is currently being remediated and redeveloped. The remedies include groundwater injections and treatment, fuel oil recovery and tank closure, management of soil disposal, excavation and disposal of hazardous and non-hazardous waste streams, installation and operation of soil vapor extraction systems and sub-slab depressurization systems, and long-term groundwater and vapor monitoring and reporting to ensure compliance with the NYSBCP. Michael Bates served as an on-site environmental during the complex beginning stages of the second phase of remediation, and completed hazardous waste delineation sampling.

#### Newtown Creek Bud Site - North Block, Queens, NY

AKRF is providing environmental planning and site assessment/remediation services for a 575-unit, 34-story apartment building at 55-01 Second Street and an 812-unit, 39-story building at 2-10 54th Avenue in Long Island City. The buildings will total 1.43 million square feet. The site was investigated and is being remediated under the NYS Brownfield Cleanup Program. Michael Bates served as an on-site environmental monitor during construction to ensure compliance with the Remedial Action Work Plan. His duties included community and work zone air monitoring, soil disposal and import tracking, inspection of the sub-slab depressurization system installation, and associated reporting.

#### 1100 Myrtle Avenue, Brooklyn, NY

AKRF prepared a Remedial Investigation Work Plan (RIWP) for New York City Mayor's Office of Environmental Remediation (OER) and performed the associated Remedial Investigation. Following, the site was accepted into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP), after which AKRF conducted additional investigation and prepared a Remedial Action Work Plan (RAWP). Michael Bates conducted inspections during start-up of the sub-slab depressurization system and soil vapor extraction system, which were installed under the new building in accordance with the RAWP and associated design documents.

## 221 Glenmore Avenue, Brooklyn, New York

AKRF is conducting a large-scale Remedial Investigation at a former lighting company facility in support of a NYSDEC Brownfield Cleanup Program application and anticipated remediation. Michael Bates performed groundwater sampling of newly installed and existing monitoring wells at the Site in accordance with EPA low-flow sampling protocols and preformed soil vapor sampling from nested vapor points to determine the vertical distribution of chlorinated solvent contamination in the subsurface.

## BESS, Astoria, Queens, New York

AKRF prepared and is implementing a Construction Health and Safety Plan (CHASP, approved by the New York Power Authority) during construction of a stand-alone new battery energy storage system at a Con Edison facility in Astoria Queens. Michael Bates served as an on-site environmental monitor during construction to ensure compliance with the CHASP. His duties included community and work zone air monitoring during utility clearance and waste characterization sampling.

## **PREVIOUS EXPERIENCE**

As a Staff Geologist at two previous environmental consulting firms, Michael Bates conducted subsurface investigations, low-flow groundwater sampling, and soil vapor sampling, and prepared associated technical reports. He also conducted routine O&M and monitoring of large groundwater and soil vapor treatment

## **Michael Bates**

P.3

systems and sub-slab depressurization systems, and oversaw installation/rehabilitation of recovery wells for system upgrades.

## L.A.B. Validation Corp., 14 West Point Drive, East Northport, New York 11731

#### Lori A. Beyer

#### **EXPERIENCE:**

1998-Present L.A.B. Validation Corporation, 14 West Point Drive, East Northport, NY President

• Perform Data Validation activities relating to laboratory generated Organic and Inorganic Environmental Data.

1998-Present American Analytical Laboratories, LLC. 56 Toledo Street, Farmingdale, NY

#### Laboratory Director/Technical Director

- Plan, direct and control the operation, development and implementation of programs for the entire laboratory in order to meet AAL's financial and operational performance standards.
- Ensures that all operations are in compliance with AAL's QA manual and other appropriate regulatory requirements.
- Actively maintains a safe and healthy working environmental that is demanded by local laws/regulations.
- Monitors and manages group's performance with respect to data quality, on time delivery, safety, analyst development/goal achievement and any other key performance indices.
- Reviews work for accuracy and completeness prior to release of results to customers.

1996-1998 Nytest Environmental, Inc. (NEI) Port Washington, New York

#### **General Manager**

- Responsible for controlling the operation of an 18,000 square foot facility to meet NEI's financial and operational performance standards.
- Management of 65 FTEs including Sales and Operations
- Ensure that all operations are in compliance with NEI's QA procedures
- Ensures that productivity indicators, staffing levels and other cost factors are held within established guidelines
- Maintains a quantified model of laboratory's capacity and uses this model as the basis for controlling the flow of work into and through the lab so as to ensure that customer requirements and lab's revenue and contribution targets are achieved.

#### 1994-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York

#### **Technical Project Manager**

- Responsible for the coordination and implementation of environmental testing programs requirements between NEI and their customers
- Supervise Customer Service Department
- Assist in the development of major proposals
- · Complete management of all Federal and State Contracts and assigned commercial contracts
- Provide technical assistance to the customer, including data validation and interpretation
- Review and implement Project specific QAPP's.

#### 1995-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York

Corporate QA/QC Officer

- Responsible for the implementation of QA practices as required in the NJDEP and EPA Contracts
- Primary contact for NJDEP QA/QC issues including SOP preparation, review and approval
- Responsible for review, verification and adherence to the Contract requirements and NEI QA Plan

#### 1992-1994 Nytest Environmental, Inc. (NEI) Port Washington, New York

#### Data Review Manager

- Responsible for the accurate compilation, review and delivery of analytical data to the company's customers. Directly and
  effectively supervised a department of 22 personnel.
- Managed activities of the data processing software including method development, form creation, and production
- Implement new protocol requirements for report and data management formats
- Maintained control of data storage/archival areas as EPA/CLP document control officer

#### 1987-1991 Nytest Environmental, Inc. (NEI) Port Washington, New York

#### **Data Review Specialist**

- Responsible for the review of GC, GC/MS, Metals and Wet Chemistry data in accordance with regulatory requirements
- Proficient with USEPA, NYSDEC, NJDEP and NEESA requirements
- Review data generated in accordance with SW846, NYSDEC ASP, EPA/CLP and 40 CFR Methodologies

1986-1987 Nytest Environmental, Inc (NEI) Port Washington, New York GC/MS VOA Analyst

#### **EDUCATION:**

1982-1985 State University of New York at Stony Brook, New York; BS Biology/Biochemistry 1981-1982 University of Delaware; Biology/Chemistry

- 5/91 Rutgers University; Mass Spectral Data Interpretation Course, GC/MS Training
- 8/92 Westchester Community College; Organic Data Validation Course
- 9/93 Westchester Community College; Inorganic Data Validation Course

Form <b>W-9</b>
(Rev. December 2011)
Department of the Treasury
Internal Revenue Service

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Par	Taxpayer identification Number (TIN)	

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose

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number to enter.

## Part II Certification

Under penalties of perjury, I certify that:

- 1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
- 3. I am a U.S. citizen or other U.S. person (defined below).

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

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Sign Here	Signature of U.S. person ►	foi	a.	BUM	Date ►	01/18/13
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#### General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

## **Purpose of Form**

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income. **Note.** If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

**Definition of a U.S. person.** For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

**Special rules for partnerships.** Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

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Westchester Community College Dale Boshart Awards this Certificate of Achievement To Professional Development Instructor: for Successfully Completing President INORGANIC DATA VALIDATION Center **MARCH 1993** LORI BEYER Professional Development Center Date \_ Parts VIIIV Assistant Dean



The Professional Development Center

WESTCHESTER COMMUNITY COLLEGE Valhalla, New York 10595

**New York State Department of Environmental Conservation** 50 Wolf Road, Albany, New York 12233



Thomas C. Jorling Commissioner

July 8, 1992

Ms. Elaine Sall Program Coordinator Westchester Community College Valhalla, NY 10595-1698

Dear Elaine,

Thank you for your letter of June 29, 1992. I have reviewed the course outline for organic data validation, qualifications for teachers and qualifications for students. The course that you propose to offer would be deemed equivalent to that which is offered by EPA. The individuals who successfully complete the course and pass the final written exam would be acceptable to perform the task of organic data validation for the Department of Environmental Conservation, Division of Hazardous Waste Remediation.

As we have discussed in our conversation of July 7, 1992, you will forward to me prior to the August course deadline, the differences between the EPA SOW/90 and the NYSDEC ASP 12/91. You stated these differences will be compiled by Mr. John Samulian.

I strongly encourage you to offer an inorganic data validation course. I anticipate the same list of candidates would be interested in an inorganic validation course as well, since most of the data to be validated consists of both organic and inorganic data.

Thank you for you efforts and please contact me if I can be of any further assistance.

Sincerely, mauren P.C

Maureen P. Serafini Environmental Chemist II Division of Hazardous Waste Remediation

914 285-6619



The Professional Development Center

October 2, 1992

Ms. Lori Beyer 3 sparkill Drive East Northport, NY 11731

Dear Ms. Beyer:

Congratulations upon successful completion of the Organic Data Validation course held August 17 - 21, 1992, through Westchester Community College, Professional Development Center. This course has been deemed by New York State Department of Environmental Conservation as equivalent to EPA's Organic Data Validation Course.

Enclosed is your Certificate. Holders of this Certificate are deemed competent to perform organic data validation for the New York State DEC Division of Hazardous Waste Remediation.

The Professional Development Center at Westchester Community College plans to continue to offer courses and seminars which will be valuable to environmental engineers, chemists and related personnel. Current plans include a TCLP seminar on November 17th and a conference on Environmental Monitoring Regulations on November 18th.

We look forward to seeing you again soon at another environmental program or event. Again, congratulations.

Very truly yours,

Passing Grade is 70% Your Grade is 99%

Elaine Sall Program Coordinator

ES/bf

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The Professional Development Center AT Westchester COMMUNITY COLLEGE 914 285-6619

June 21, 1993

Dear Ms. Beyer:

Enclosed is your graded final examination in the Inorganic Data Validation course you completed this past March. A score of 70% was required in order to receive a certificate of satisfactory completion. Persons holding this certificate are deemed acceptable to perform Inorganic Data Validation for the New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation.

I am also enclosing a course evaluation for you to complete if you have not already done so. The information you provide will greatly aid us in structuring further courses. We wish to make these course offerings as relevant, targeted and comprehensive as possible. Your evaluation is vital to that end.

Congratulations on your achievement. I look forward to seeing you again at another professional conference or course. We will be co-sponsoring an environmental monitoring conference on October 21, 1993 with the New York Water Pollution Control Association, Lower Hudson Chapter, at IBM's Yorktown Heights, NY site. Information regarding this event will be going out in August.

Very truly yours,

Elaine Sall Program Coordinator

ES/bf

Enclosures



## Qualifications Summary

- Over 30 years of experience in the environmental field and over 40 years in analytical laboratories
- Extensive experience involving management of environmental laboratory operations.
- Involvement with NELAC since its inception and member of "Accreditation Committee"
- ASTM committee member on D-34 "Waste Characterization and Disposal"
- Co-founder of Matrix Analytical, Inc.
- Diverse experience in laboratory from medical, industrial and environmental
- Lab Design for wastewater, water treatment, analytical & environmental facilities for existing & new labs, including equipment selection, casework, hood selection.
   Linear process flow for expansion considerations

## James C. Todaro

Quality Assurance Officer

## **Professional Affiliations**

National Environmental Laboratory Accreditation Conference (NELAC) American Chemical Society (ACS) American Society for the Testing of Materials (ASTM) Independent Testing Laboratory Association (ITLA) Society of American Military Engineers (SAME)

## **Fields of Expertise**

Laboratory Management – Environmental, Analytical, Medical Marketing and Sales Laboratory Design

## **Higher Education**

B.A., Biology – Ricker College (1970) M.T. A.S.C.P. – Norwood Hospital (1971)

## **Employment History**

2007-Present	Alpha Analytical Labs – Quality Assurance Officer.
2005-2007	Alpha Analytical Labs – Laboratory Director - Mansfield
2000-2005	Alpha Analytical Labs – Laboratory Director - Westboro
1983-2000	Matrix Analytical Laboratory – Owner/Laboratory Director
1979-1983	NE Medical Laboratory – Laboratory Director
1976-1979	Corning Medical Diagnostics – Quality Assurance Officer
1974-1976	NE Deaconess Hospital – Emergency Lab Technologist
1971-1974	NE Medical Laboratory – Automated Chem Supervisor

## **Professional Training/Committees**

NELAC/TNI Expert PT Committee

DoD Technical Advisory Group

MassDEP Laboratory Advisory Committee

NJDEP Environmental Laboratory Advisory Committee

ASTM D-34 Waste Management Committee

Certified Instructor 4 hr LEP and LSP CEU courses for: "Interpretation of Analytical Data", "Selection of Organic Methods".

## Qualifications Summary

- Over 30 years of experience in the environmental field and over 40 years in analytical laboratories
- Extensive experience involving management of environmental laboratory operations.
- Involvement with NELAC since its inception and member of "Accreditation Committee"
- ASTM committee member on D-34 "Waste Characterization and Disposal"
- Co-founder of Matrix Analytical, Inc.
- Diverse experience in laboratory from medical, industrial and environmental
- Lab Design for wastewater, water treatment, analytical & environmental facilities for existing & new labs, including equipment selection, casework, hood selection.
   Linear process flow for expansion considerations

## James C. Todaro

Quality Assurance Officer

## **Professional Affiliations**

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## **Fields of Expertise**

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1976-1979	Corning Medical Diagnostics – Quality Assurance Officer
1974-1976	NE Deaconess Hospital – Emergency Lab Technologist
1971-1974	NE Medical Laboratory – Automated Chem Supervisor

## **Professional Training/Committees**

NELAC/TNI Expert PT Committee

DoD Technical Advisory Group

MassDEP Laboratory Advisory Committee

NJDEP Environmental Laboratory Advisory Committee

ASTM D-34 Waste Management Committee

Certified Instructor 4 hr LEP and LSP CEU courses for: "Interpretation of Analytical Data", "Selection of Organic Methods".

APPENDIX J SITE MANAGEMENT FORMS

#### AKRF, Inc.

## **Annual Site-Wide Inspection**

## **Overview of Annual Site-Wide Inspection requirements:**

1) General Site conditions at time of inspection;

2) SMP-related Site Activities being conducted, upcoming SMP-related tasks;

3) Institutional Control (IC) Checklist (SMP, FMP maintained on-Site, routine SMP tasks being conducted);

4) Evaluation of Engineering Controls; and

5) Site Documentation.

## 1) General Site conditions at time of inspection:

NAME:	DATE:
TIME:	WEATHER:
Annual Inspection or Emergency Inspection (if emergency	gency, specify nature)?
Notes:	
2) Are any SMP-related site activities currently be	eing conducted (SSDS and Biosparge Operation)?

Notes/Details:

## 3) IC Checklist (SMP maintained on-Site, routine SMP tasks being conducted)

Copy of SMP on-Site?	YES	
Building Use Still Consistent with SMP (Restricted Residential)?	YES	

## Have the required SMP tasks been conducted during the reporting period?

SSDS inspections/monitoring	YES		
Biosparge system monitoring	YES		
Quarterly groundwater monitoring	ng/sampling	YES	NO
Notes:			

## 4) Evaluation of ECs

Environmental Control Type: Biosparge Syst	em	
Is the biosparge system currently operating? If no, describe reason/alarm condition(s):	VES	
Are the various gauges and components of system and the digital control panel clean?	VES	
Have any problems occurred that require corrective action to the treatment system components or manifold? If yes, describe:	T YES	NO

Biosparge System operations have also been documented using the applicable inspections logs (see attached) that will be provided as part of the PRR.

Notes:

NO
NO
NO

Notes:

#### BCP Site No. C241230 Queens Animal Shelter and Care Center

#### AKRF, Inc.

Environmental Control Type: Composite Cover	System	
Is the composite cover system intact?	T YES	
If there are significant cracks/breaks/openings, describe the size and locat	ion:	
- · · ·		
Are corrective actions required to address the condition of the composite cover system?	YES	NO
If yes, describe:		
·		

The condition of the composite cover system is being documented in this inspection log, which will be provided as part of the PRR.

Notes:\_\_\_\_\_

### 5) Site documentation

Including updates regarding notification to NYSDEC regarding any changes to Site conditions/operations, routine reporting to NYSDEC, etc.).

Notes:\_\_\_\_\_

		BIOSPAR			
	Queen	s Animal Center and	Care Shelter, 7	906 Flushing Ave, Queens	
Increator No		Dat	<u>.</u>		
	ine.				
			GENERAL		
Weather:	Temperature:	Baro Pres	ometric ssure:	Equipment Room Temperature	е:
Has the biospa	arge system being cycled on o	or off this month? On	/ Off (circle or	e)	
lf issues cy	cling system on or off, ALER	T PROJECT MANAGE	ER and please	describe issue:	
ls the biospar	ge compression (in enclosure)	currently operating?	Yes / No (circ	le one)	
lf no, ALEF	RT PROJECT MANAGER and	please list reason/ala	arm condition:		
If yes, ALE	RT PROJECT MANAGER and	d please note findings	s:	<i></i>	
Any evidence If yes, ALEF	of system tampering, vandalis RT PROJECT MANAGER and	or damage to the e I please note findings	exhaust stack?	Yes / No (circle one)	
Notes: This bi PID - Photoior	iosparge Inspection Log shou nization Detector: ppm - parts	d be completed along per million: NA - Not a	g with the sam applicable: GA	oling log for each sampling e C - Granular Activated Carbo	vent. on
Comments:		· ·			
		Emergency Conta	act Information		
	Name	Title		Contact Number	
	Deborah Shapiro	AKRF Project [	Director	646-388-9544 (office)	
	Patrick Diggins	Project Man	ager	914-922-2356 (office) 603-494-7090 (cell)	7
	TBD	Owner's Repres	sentative	TBD	

	Queen	BIOS MON s Animal Center	SPARGE INSPECTI THLY SYSTEM INS and Care Shelter, 1	ON LOG PECTION 1906 Flushing Ave, Queens
Location	Applied Pressure	Well Air Flow Rate (SCFM)	Compressor Air Flow Reading (SCFM)	Notes
	Approx. 5 PSI	Approx. 1 to 2 SCFM	Approx. 46 SCFM	
Air Sparge Compressor	NA	NA		
SW-01			NA	
SW-02			NA	
SW-03			NA	
SW-04			NA	
SW-05			NA	
SW-06			NA	
SW-07			NA	
SW-08			NA	
SW-09			NA	
SW-10			NA	
SW-11			NA	
SW-12			NA	
SW-13			NA	
SW-14			NA	
SW-15			NA	
SW-16			NA	
SW-17			NA	
SW-18			NA	
SW-19			NA	
SW-20			NA	
SW-21			NA	
SW-22			NA	
SW-23			NA	

	SSDS M Queens Animal Shelter	ONITORING INS	SPECTION FOR r, 1906 Flushing	M Ave, Queens, NY	,
Inspector Name:			Date:		
Time In:			Time Out:		
General					
Weather:	Temperature:		Barometric Pres	sure:	
1. When was the last rain	event?				
2. Is the blower currently	operating? Yes / No				
If no, please list reasor	n/alarm condition:				
3. Any evidence of system	n tampering, vandalism or damage in	the first floor equ	ipment room? -		
4. Is air discharging from	the exhaust piping to the root? -				
5. Any evidence of system	n tampering, vandalism, or damage to	the exhaust stac	ck? -		
6. Were all cleanout/sam	pling port caps securely attached prior	to system testing	g? -		
If no, list location and o	contact Project Manager/Project Direct	tor.			
7. Is the concrete floor sla	ab overlying all of the SSDS piping run	is intact? -			
If no, list location and co	ontact Project Manager/Project Directo	or.			
		SSDS Oper	ations		
Blower Inlet PID (ppm)					
	I	1			
Monitoring Point (MP) or Riser Leg (RL) Identification	Location	Flow Rate <sup>1</sup> cfm	Applied Vacuum <sup>1</sup> in. H <sub>2</sub> O	Induced Vacuum <sup>2</sup> in. H <sub>2</sub> O	Notes
MP-01	Laundry Room	NA	NA		
MP-02	Hallway near Interior Dog Run 1	NA	NA		
MP-03	Hallway near Exterior Dog Run 1	NA	NA		
MP-04	Treatment Room	NA	NA		
R-1				NA	
R-2				NA	

R-3	Groundwater Treatment Room		NA	
R-4			NA	
R-5			NA	
R-6			NA	
Combined applie	ed vacuum on SSDS riser =	NA	NA	
<b>Notes:</b> 1. Normal system flow rate each riser leg (R-1 throug	tes range from 40 to 100 cfm. Applied h R-6).	vacuum readings rang	ge from 1 to 15 in. H <sub>2</sub> O. Sys	stem readings will be obtained from
<ol> <li>Normal system induce</li> <li>through MP-04).</li> </ol>	d vacuum readings should be a minim	num of 0.004 in. H <sub>2</sub> O. S	System readings will be obta	ined from each monitoring point (MP-
3. If observations are cor	nfirmed to be outside of this range, info	orm emergency contac	ts below and prepare correc	tive action plan, if necessary.
in. of $H_2O$ - inches of wate	er			
cfm - cubic feet per minut NA - not applicable	e			

## SSDS/Biosparge System Shutdown Log TRACKING FORM

Queens Animal Shelter and Care Center, 1906 Flushing Ave, Queens

Date	Time	SSDS or Biosparge	Message	Unusual conditions on arrival	Restart successful?	Description of persistant problem(s)
MM/DD/YY	HH:MM	SSDS	SSDS High Temperature Alarm	SSDS fan shutdown.	Yes	SVE blower temperature switches tripped, mainly caused by high ambient temperature. Discussed increasing temperature switch range with PM.

	Queen	BIOSP MONTH	ARGE INSPECT	ON LOG PECTION	ve Queens	
	Queen	s Animai Center ai	la Cale Sheller,	1900 Flushing A	ve, Queens	
Inspector Nar	me: P. Diggins	C	Date:	11/13/2023		
Time IN:	820	т	Time OUT:	1100		
			GENERAL			
Weather:	Sunny Temperature:	35 deg F E F	Barometric Pressure:	30.42	Equipment Room Temperature:	~70 deg F
Has the biospa	arge system being cycled on	or off this month?	On / Of (circle or	ie)	Commissioned	d at 0838
lf issues cy	cling system on or off, ALER	T PROJECT MANA	AGER and please	describe issue:		
Is the biospare	ne compression (in enclosure	) currently operating	a? Yes / No (circ	le one)		
If no. ALEF	RT PROJECT MANAGER and	l please list reason	/alarm condition:			
		, prodoc not rodoc				
				-		
Any evidence	of system tampering, vandalis	sm or damage? Y	es / No (circle on	e)		
If yes, ALE	RT PROJECT MANAGER an	d please note findi	ngs:			
Any evidence	of system tampering, vandalis	sm or damage to th	ne exhaust stack?	Yes / No circ	e one)	
If yes, ALEF	RT PROJECT MANAGER and	d please note findin	ngs:	$\bigcirc$	, ,	
Notes: This bi	iosparge Inspection Log shou	ld be completed al	ong with the sam	pling log for eac	h sampling eve	nt.
PID - Photoior	nization Detector; ppm - parts	per million; NA - N	ot applicable; GA	C - Granular Ac	tivated Carbon	
Comments:						
						-
	Namo	Emergency Co	ontact Information	Contact	Numbor	-
	Deborah Shaniro		ne Ant Director	646-388-0		-
				Q14_022_2	356 (office)	-
	Patrick Diggins	Project N	Manager	603-494-	7090 (cell)	-1
	TBD	Owner's Rep	presentative	T	BD	

,	

	BIOSPARGE INSPECTION LOG MONTHLY SYSTEM INSPECTION Queens Animal Center and Care Shelter, 1906 Flushing Ave, Queens						
Location	Applied Pressure	Well Air Flow Rate (SCFM)	Compressor Air Flow Reading (SCFM)	Notes			
	Approx. 5 PSI	Approx. 1 to 2 SCFM	Approx. 46 SCFM				
Air Sparge Compressor	NA	NA	46.2	Sparge PSI: 9, Ext. Temp. 72 deg F			
SW-01	4.8	1.8	NA				
SW-02	4.8	2.0	NA				
SW-03	1.5	2.0	NA				
SW-04	2.0	2.0	NA				
SW-05	1.0	1.4	NA				
SW-06	2.0	2.0	NA				
SW-07	1.0	2.0	NA				
SW-08	4.9	1.0	NA				
SW-09	4.8	1.9	NA				
SW-10	1.0	0.8	NA				
SW-11	4.9	2.0	NA				
SW-12	1.0	2.0	NA				
SW-13	1.0	1.2	NA				
SW-14	4.9	2.0	NA				
SW-15	1.0	1.5	NA				
SW-16	4.8	1.2	NA				
SW-17	4.8	0.3	NA				
SW-18	5.0	1.0	NA				
SW-19	1.0	0.3	NA				
SW-20	4.9	0.3	NA				
SW-21	4.9	1.3	NA				
SW-22	4.8	1.6	NA				
SW-23	3.0	2.0	NA				

SS Queens Animal St	SDS MONITORING INS	SPECTION FOR r, 1906 Flushinç	M J Ave, Queens, N	
Inspector Name: P. Diggins		Date:	11/13/2023	
Time In: 8:20		Time Out:	11:00	
General				
Sunny Temperature: 35 deg F		Barometric Pre	ssure:	30.42
1. When was the last rain event? 11/7/2023				
2. Is the blower currently operating? Yes / No				
If no, please list reason/alarm condition:				
3. Any evidence of system tampering, vandalism or dama	ge in the first floor equi	pment room? -		
				No.
4. Is air discharging from the exhaust piping to the roof? -	Yes.			
C. Any subtract of system tempering yandaliam, or dome				
5. Any evidence of system tampering, vandalism, or dama	ige to the exhaust stace	K? - NO.		
6. Were all cleanout/sampling port caps securely attached	I prior to system testing			
If no, list location and contact Project Manager/Project	Director.			
7. Is the concrete floor slab overlying all of the SSDS pipir	ig runs intact? -	Yes.		
If no, list location and contact Project Manager/Project D	irector.			
	SSDS Oper	ations		
Blower Inlet PID (ppm) 0				
			<del></del>	
Monitoring Point (MP) or Pisor Log (PL)	Elow Pato <sup>1</sup>	Applied Vacuum <sup>1</sup>	Induced	Notos
Identification	cfm	in. H <sub>2</sub> O	in. H <sub>2</sub> O	NOLES
MP-01 Laundry Room	NA	 NA	-	Monitoring point not accessible
MP-02 Hallway near Interior Dog R	un 1 NA	NA	-	Monitoring point not accessible
MP-03 Hallway near Exterior Dog R	tun 1 NA	NA	-	Manitaring point not approaible
MP-04 Treatment Room				Information point not accessible
	NA	NA		Monitoring point not accessible
R-1	NA 252	NA 2.67	- NA	Monitoring point not accessible

Notes:		-			
Combined applied vacuum on SSDS riser =		NA	3.9	NA	
R-6		299	2.79	NA	
R-5		321	2.56	NA	
R-4	Gloundwater Treatment Room	157	2.57	NA	
R-3	Groundwater Treatment Room	200	2.64	NA	

 Normal system flow rates range from 40 to 100 cfm. Applied vacuum readings range from 1 to 15 in. H<sub>2</sub>O. System readings will be obtained from each riser leg (R-1 through R-6).

2. Normal system induced vacuum readings should be a minimum of 0.004 in. H<sub>2</sub>O. System readings will be obtained from each monitoring point (MP-01 through MP-04).

3. If observations are confirmed to be outside of this range, inform emergency contacts below and prepare corrective action plan, if necessary.

in. of H<sub>2</sub>O - inches of water cfm - cubic feet per minute NA - not applicable APPENDIX K SSDS COMPONENT SPECIFICATIONS



## **Industrial Plastic Fan Submittal Sheet**

Date:	October 19, 2021
Job Name:	PerfectAire
Model #:	CDD-200eco
Orientation:	tbd
CFM:	600
S.P.:	7.0"
Fan RPM:	3450
Motor:	1.5 HP 3/60/230/460/3450 RPM TEFC
Drives:	Direct
Housing Material:	Polypropylene
Impeller Material:	Polypropylene
Support Set Material:	Stainless Steel
Accessories:	1.5 HP VFD Controller, Inlet/Outlet Flex Connectors, Outlet Flange, Steel Spring Vibration Isolators, Outlet Quadrant Damper, PVC motor Cover, Drain

Industrial Plastic Fan 339 North Main Street • MA 01949 Middleton Phone 1.800.891.3656 • Fax 781 938 0064 www.ipfcolasit.com · adamc@ipfcolasit.com



## Data sheet CMVeco 200/200

Page 1

## **Reference 1: Reference 2: Reference 3:**

## **Configuration data**

600.0 cfm
7.000 InWg
68 °F
0.0000433 lb/in <sup>3</sup>
non defined
Frequency converter



## **Operating data**

Airflow	600.0	cfm
Static pressure	7.000	InWg
Dynamic pressure	0.195	InWg
Total pressure	7.195	InWg
Flow velocity	354.9	in/s
Mechanical efficiency	50.7	%
Sound pressure at 3 m	61	dB(A)
Operating impeller speed	2,967	rpm
Max.rpm at 68 °F	3,600	rpm
Shaft power	1.307	hp

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## Reference 1:

Reference 2:

**Reference 3:** 

## Motor

The supplier will select a suitable motor.

## Weight

Ventilator weight Motor weight	6.12	lb Ib
Total weight	-	lb
ErP conformity		
System efficiency	0.0	%
Opt. overall efficiency	0.0	%
Deg. of efficiency ErP	n. a.	
Opt. deg. of efficiency	-	
Opt. electrical performance	0.000	hp
Opt. Airflow	0.0	cfm
Opt. static pressure	0.000	InWg
Opt. rotational speed	0	rpm

## **Options/Accessories**

The supplier will select the accessories.

mpeller				Tempe	rature				
Peripheral speed	1,926.6 in	1,926.6 in/s		Max. operating temperature			ure	- °F	
Impeller diameter	12.40 in	12.40 inch		(for conf	iguration	n point)			
Mass moment of inertia	- Ib	oft²		Max. ten	nperatui	re at		- °	F
Inside diameter Ø	1.10			3,600 rp	m				
Noise emission level		(Sound	l pressu	re level L	.pA = Lw	/A – 7 dE	3S (A) di	stance 1	meter)
Noise emission (case radiation	with lines con	inected):							
	Hz	63	125	250	500	1000	2000	4000	8000
Octave noise emission level:	dB(A)	34	51	60	65	74	75	65	53
Noise emission level	LwA	dB(A) 78							
Noise emission (channel values	, outlet side)	:							
	Hz	63	125	250	500	1000	2000	4000	8000
Octave noise emission level:	dB(A)	53	65	74	80	82	82	76	66
Noise emission level	LwA	dB(A) 87							



Page 2

## Dimension sheet direct drive





CDD	125	160	200	250	315	400
000	125	100	200	230	515	400
A	7.40	8.90	10.83	13.23	16.34	17.80
В	8.94	11.26	13.98	17.36	21.81	25.24
С	6.46	8.11	10.04	12.44	15.59	17.36
D	8.11	9.92	12.20	14.96	18.54	20.75
E	6.69	7.87	9.49	11.54	14.13	14.88
F	7.87	8.86	10.83	12.99	15.75	16.73
G	10.63	11.42	14.96	16.93	18.90	22.83
Н	9.84	12.20	14.96	18.50	22.83	26.38
I	9.45	10.24	13.78	15.35	17.32	21.26
K	8.66	8.66	10.24	10.83	12.80	14.17
L	9.84	9.84	11.42	12.40	14.37	15.75
М	1.38	1.85	2.52	3.07	4.02	5.24
Ν	4.33	4.72	5.51	6.30	7.48	8.66
ØΡ	0.39	0.39	0.39	0.39	0.39	0.39
ØR	4.92	6.30	7.87	9.84	12.40	15.75
S	0.59	0.59	0.59	0.79	0.79	0.79

RD 0	RD 45	RD 90	RD 135	RD 180	RD 270	RD 315
				auf Anfrage		
LG O	LG 45	LG 90	LG 135	LG 180	LG 270	LG 315
Ĩ	Ô	ð		auf Anfrage		Þ

Industrial Plastic Fan 339 North Main St Middleton, MA 01949 (800) 891-3656 www.ipfcolasit.com



IPF Specification Material for the CMV-CDD series.

IPF/Colasit Fans are made according to ISO 9001-2000 and tested for air flow according to ISO 5801standards.

IPF/Colasit polypropylene fans are made from polypropylene with a special flame retardant additive from Simona of Germany. This material is classified as flame retardant under the European standard DIN 4102 B1. (See enclosed sheet for more details on DIN 4102 B1.)

The manufacturing process is vacumn formed thermoplastics which ensures more precision moldings of housing and impeller.

There is no metal exposed in the air stream as there is a polypropylene nose cones that shields the aluminum clamp adaptor that holds the impeller to the motor shaft.

PPs can be used in applications up to 160 degrees and is therefore available for a wider range of applications than PVC which has a temperature limit of 130 degrees.

PPs is more flexible than PVC and therefore easier to work with and less prone to be damaged by installation or maintenance error.

The CMV and the CDD series are the same fan. CMV is belt driven version while CDD is direct drive. The only appreciable difference in footprint is the mounting of the motor on the support set.

The CMV-CDD 125-180 centrifugal fan has a radial impeller with flat blades.

The CMV-CDD 200-400 centrifugal fan has a radial impeller with forward inclined blades.

The CMV and CDD 125-400 comes with a 3 year warranty for the housing, impeller, and support set, one year manufacturers warranty on the motor. Reinstallation expense is not covered.

The CMV-CDD 125-400 comes with a 10 year warranty against UV degradation for fans on roof tops.



The CMV series is belt driven series with or without adjustable sheaves. The CDD series is direct drive version of the same fan either in Direct Drive or for use with Variable Frequency Drives.

The CMV-CDD series fans meet relevant statues for Noise levels at 3 DBA as set by OSHA standards (See enclosed sheets for Sound Power Sound Pressure and for Performance curves in metric).

The CMV-CDD series comes with an epoxy coated carbon steel support set.

The CMV-CDD series can be purchased with either CW or CCW orientation with a choice of 6 discharge positions for each orientation.

The CMV-CDD series can be mounted with a wide range of motors that meet explosion and hazardous duty standards for UL, CSA, ATEX and other internationally recognized codes.

	DIN 52 900 Safety Data Sheet						January 1990
Com	pany:	SIMONA	AG, Kunststo	ffwerke,	Teichweg 16, 65	70 Kirn/l	Nahe
Trad	e name:	SIMONA*	PPs				
1.1	Chemical character Polypropylene w	ristics: <b>/ith flame p</b>	protection			· · · · · · · · · · · · · · · · · · ·	
1.2 1.3 1.4	Form: <b>semi-fini</b> Colour: <b>different</b> Smell: <b>not distin</b>	shed produ nguishable	ıct				
2	Physical und safety	technical ind	lications				tested acc. to:
2.1	Change of state Crystalline melti	ing range			160-165	°C ℃	
2.2	Density Settled apparent der Steam pressure	nsity	(°C)		0,95	g/cm³ kg/m³	DIN 53 479
2.4 2.5	Viscosity Solubility in water in		(°C) (°C) (°C) (°C)		not applicable not applicable insoluble	mbar mbar g/l	
2.6 2.7 2.8 2 9	pH-value (at g/l H <sub>2</sub> C Fire point Inflammation temper	D) alure	(°C) inflammatic	on point	not applicable 360	°C °C	value indicate in literature
2.12	In case of exceed carbon black also arise during the Dangerous reactions	ding tempe o carbon di burning pro	ratures the m ioxide and wa ocess. none	naterial ( nter as w	levelops halogen ell as low molect	hydroge ilar part	n. Besides s of PP may
2.13	Further indications		none				
3	Transport GGVSe GGVE/	ee/IMDG-Coc	le:	UN	Nr: /ADR:	ICAO/I ADNR	ATA-DGR:
Furthe	r indications: <b>no pa</b>	rticular ins	structions hav	e to be (	observed		
,	Instructions						
	The material is no Polymeres are no to the chemical is basic inventory (I CAS number.	ot subject as subject t aw. The ad ECOIN). Th	to the regulat o any obligati ditives contai erefore it is n	ion of da on to giv ined are ot neces	angerous materia ve information ac registered in the sary to indicate a	ls. c. a	
	The material is ne Polymeres are no to the chemical le basic inventory (I CAS number.	ot subject as subject t aw. The ad ECOIN). Th	to the regulat o any obligati Iditives conta Ierefore it is n	ion of da on to giv ined are ot neces	angerous materia ve information ac registered in the sary to indicate a	5. C. A	

D	DIN 52 900	Safety Data Sheet	
Frad	de name: SIMONA® PPs		
5 5.1	Protection procedure, storage	e und handling	
	no special protection pr		
52	Personal protective	broothing much wet	
J. L	equipment:	hand protection: not necessary eye protection: no hand protection: not necessary miscellaneous: no	t necessary
52	Working busines -		- nesessary
0.0	recomme	nded.	essing is
5.4	Fire- and explosion protection		
	recommended.	re necessary. The general rules of preventive fir	e protection are
5.5	waste disposal 1. Recy	cling	
	2. Taki	ng into consideration legal instructions concern	ing inert waste,
	e.g. (	garbage dump or garbage incineration	
5	Measures in case of accidents	s and fire	
2.1	Atter spilling, leaking etc.		
.2	Sultable lire lighting appliance	e: water, toam, carbon dioxide	
	Not suitable:		
5.3	First aid:		
	Skin burnings due to me	ted PPs must be clinically treated.	
.4	Further indications PPs can	be classified as a heavily inflammable material	
*	acc. to D	NN 4102, B1.	
	Toxic indications		
	Non toxic. It contains	manual which do not toud to our down t	
	acc. to our present	knowledges.	t of dioxine
	2. Bound antimony tri	oxide.	
	Ecological indications		
	The material does not dis	pose of any effects being harmful to the environ	ment.
	Further comments		
	This information is based	on our todays knowledge. They are only	
	meant to describe our pro	oducts in respect to safety requirements and	
		to quarantee certain properties.	
	wo not have the meaning		Page 2

## Technical Data SIMONA<sup>®</sup> PPs

#### **Properties and Applications**

- excellent heat stabilized
- flame retardant acc. to DIN 4102-B1 certificate for sheets from 2 up to 20 mm thickness and acc. to DIN 4102-B1 also for pipes and fittings (wall thickness from 2 up to 20 mm)
- particularly for the use in the ventilation technology
- also see product range Pipes and Fittings made of PPs

#### **Technical Data**

Density, g/cm³ ISO 1183	0,95
Yield Stress, MPa DIN EN ISO 527	32
Yield Strain, % DIN EN ISO 527	8
Tensile strain at break, % DIN EN ISO 527	70
E-modulus of elasticity in tension, MPa DIN EN ISO 527	1300
Impact strength, kJ/m <sup>2</sup> DIN EN ISO 179	without break
Notched impact strength, kJ/m <sup>2</sup> DIN EN ISO 179	6
Ball indentation hardness, MPa DIN EN ISO 2039-1	70
Shore hardness D ISO 868	72
Coefficient of linear thermal expansion, K-1, DIN 53752	1,6 x 10 <sup>-4</sup>
Thermal conductivity, W/m×K DIN 52612	0,22
Fire behaviour DIN 4102	B 1 <sup>3</sup>
Dielectic strength, kV/mm VDE 0303 - 21	22
Surface resistivity, Ohm DIN IEC 60167	10 <sup>14</sup>
Temperature range, °C	0 bis +100
Physiologically acceptable acc. to $BgVV^1$	no

<sup>1</sup> Federal Health Institute for the protection of consumers and veterinary medicine

<sup>2</sup> Food and Drug Administration

<sup>3</sup> DIN 4102-B1 certificate for sheets from 2 mm up to 20 mm thickness and

DIN 4102-B1 for pipes and fittings (wall thickness from 2 up to 20 mm)

# BALDOR • RELIANCE

## **Product Information Packet**

# **VEM3550**

1.5HP,3500RPM,3PH,60HZ,56C,3520M,TEFC,F1

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## **BALDOR** • **RELIANCE** Product Information Packet: VEM3550 - 1.5HP,3500RPM,3PH,60HZ,56C,3520M,TEFC,F1

Part Detail								
Revision:	х	Status:	PRD/A	Change #:		Proprietary:	No	
Туре:	AC	Elec. Spec:	35WGM760	CD Diagram:	CD0005	Mfg Plant:		
Mech. Spec:	35J302	Layout:	35LYJ302	Poles:	02	Created Date:	05-21-2010	
Base:	Ν	Eff. Date:	12-20-2019	Leads:	9#18			

Specs			
Catalog Number:	VEM3550	Heater Indicator:	No Heater
Enclosure:	TEFC	Insulation Class:	F
Frame:	56C	Inverter Code:	Inverter Ready
Frame Material:	Steel	KVA Code:	L
Output @ Frequency:	1.500 HP @ 60 HZ	Lifting Lugs:	No Lifting Lugs
Synchronous Speed @ Frequency:	3600 RPM @ 60 HZ	Locked Bearing Indicator:	Locked Bearing
Voltage @ Frequency:	208.0 V @ 60 HZ	Motor Lead Quantity/Wire Size:	9 @ 18 AWG
	460.0 V @ 60 HZ	Motor Lead Exit:	Ко Вох
	230.0 V @ 60 HZ	Motor Lead Termination:	Flying Leads
XP Class and Group:	None	Motor Type:	3520M
XP Division:	Not Applicable	Mounting Arrangement:	F1
Agency Approvals:	CSA	Power Factor:	85
	CSA EEV	Product Family:	General Purpose
	UR	Pulley End Bearing Type:	Ball
Auxillary Box:	No Auxillary Box	Pulley Face Code:	C-Face
Auxillary Box Lead Termination:	None	Pulley Shaft Indicator:	Standard
Base Indicator:	No Mounting	Rodent Screen:	None
Bearing Grease Type:	Polyrex EM (-20F +300F)	RoHS Status:	ROHS COMPLIANT
Blower:	None	Shaft Extension Location:	Pulley End
--------------------------------	---------------------------	-----------------------------	---------------------
Current @ Voltage:	4.000 A @ 208.0 V	Shaft Ground Indicator:	No Shaft Grounding
	3.800 A @ 230.0 V	Shaft Rotation:	Reversible
	1.900 A @ 460.0 V	Shaft Slinger Indicator:	No Slinger
Design Code:	В	Speed Code:	Single Speed
Drip Cover:	No Drip Cover	Motor Standards:	NEMA
Duty Rating:	CONT	Starting Method:	Direct on line
Electrically Isolated Bearing:	Not Electrically Isolated	Thermal Device - Bearing:	None
Feedback Device:	NO FEEDBACK	Thermal Device - Winding:	None
Front Face Code:	Standard	Vibration Sensor Indicator:	No Vibration Sensor
Front Shaft Indicator:	None	Winding Thermal 1:	None
		Winding Thermal 2:	None

## **BALDOR** • **RELIANCE** Product Information Packet: VEM3550 - 1.5HP,3500RPM,3PH,60HZ,56C,3520M,TEFC,F1

Nameplate NP3441LUA		
CAT.NO.	VEM3550	
SPEC	35J302M760	
HP	1.5	
VOLTS	208-230/460	
AMPS	4-3.8/1.9	
RPM	3500	
FRAME	<b>56C PH</b> 3 <b>PH</b> 3	
SF	1.15 CODE L DES B CLASS F	
NEMA NOM. EFF	84 <b>PF</b> 85	
RATING	40C AMB-CONT	
CC	010A USABLE AT 208V	
ENCL	TEFC SER	
DE	6205 ODE 6203	
VPWM INVERTER READY		
CT6-60H(10:1)VT3-60H(20:1		
	50HZ 1.5HP 190/380V 4.6/2.3A	SF1.0

Parts List		
Part Number	Description	Quantity
SA196997	SA 35J302M760	1.000 EA
RA184436	RA 35J302M760	1.000 EA
34FN3002B01	EXTERNAL FAN, PLASTIC, .637/.639 HUB W/	1.000 EA
35CB3007	35 CB CASTING W/.88 DIA. LEAD HOLE	1.000 EA
36GS1000SP	GASKET-CONDUIT BOX, .06 THICK #SV-330 LE	1.000 EA
51XB1016A07	10-16 X 7/16 HXWSSLD SERTYB	2.000 EA
11XW1032G06	10-32 X .38, TAPTITE II, HEX WSHR SLTD U	1.000 EA
35EP3122K00	MASTER ODE,203 BRG,.683SH,#26 DRN,FH MTG	1.000 EA
HW5100A03	WAVY WASHER (W1543-017)	1.000 EA
35EP3307F00	MASTER DE,205 BRG,.998SH,#26 DRN	1.000 EA
51XN1032A20	10-32 X 1 1/4 HX WS SL SR	2.000 EA
51XB1214A16	12-14X1.00 HXWSSLD SERTYB	1.000 EA
35FH4005A32SP	IEC FH NO GRSR W/3 HOLES - PRIMED	1.000 EA
51XW1032A06	10-32 X .38, TAPTITE II, HEX WSHR SLTD S	3.000 EA
35CB4521GX	CONDUIT BOX LID KIT **ORDER INDIV PARTS	1.000 EA
51XW0832A07	8-32 X .44, TAPTITE II, HEX WSHR SLTD SE	4.000 EA
HW2501D13	KEY, 3/16 SQ X 1.375	1.000 EA
HA7000A04	KEY RETAINER 0.625 DIA SHAFTS	1.000 EA
85XU0407S04	4X1/4 U DRIVE PIN STAINLESS	2.000 EA
MJ1000A02	GREASE, MOBIL POLYREX EM - 124047	0.050 LB
MG1000Y03	MUNSELL 2.53Y 6.70/ 4.60, GLOSS 20,	0.017 GA
HA3100A12	THRUBOLT 10-32 X 7.375	4.000 EA
LC0005E01	CONN.DIA./WARNING LABEL (LC0005/LB1119N)	1.000 EA
NP3441LUA	ALUM SUPER-E VPWM INV READY UL CSA-EEV C	1.000 EA

## **BALDOR** • **RELIANCE** Product Information Packet: VEM3550 - 1.5HP,3500RPM,3PH,60HZ,56C,3520M,TEFC,F1

Parts List (continued)		
Part Number	Description	Quantity
35PA1066	PKG GRP, PRINT PK1008A06	1.000 EA
PK3083	STYROFOAM PACKING CRADLE	1.000 EA
MN416A01	TAG-INSTAL-MAINT no wire (1200/bx) 1/21	1.000 EA
PK3088	MICROFOAM, 8"X"8 PERF. SHEETS	1.000 EA
FE-0000001	ZRTG FE ASSEMBLY	1.000 EA
PE-0000001	ZRTG PE ASSEMBLY	1.000 EA

#### AC Induction Motor Performance Data

Record # 84841

Typical performance - not guaranteed values

Winding: 35WGM7	60-R082	Type: 3	3520M	Enclosure: TEFC
Nameplate Data			460 V, 60 Hz: High Voltage Connection	
Rated Output (HP)		1.5	Full Load Torque	2.22 LB-FT
Volts		208-230/460	Start Configuration	direct on line
Full Load Amps		4-3.8/1.9	Breakdown Torque	9.49 LB-FT
R.P.M.		3500	Pull-up Torque	3.61 LB-FT
Hz	60 Phase	3	Locked-rotor Torque	7.35 LB-FT
NEMA Design Code	B KVA Code	L	Starting Current	17.9 A
Service Factor (S.F.)		1.15	No-load Current	0.932 A
NEMA Nom. Eff.	84 Power Factor	85	Line-line Res. @ 25ºC	9.66 Ω
Rating - Duty		40C AMB-CONT	Temp. Rise @ Rated Load	43°C
S.F. Amps			Temp. Rise @ S.F. Load	50°C
			Locked-rotor Power Factor	54.9
			Rotor inertia	0.0553 lb-ft²

#### Load Characteristics 460 V, 60 Hz, 1.5 HP

% of Rated Load	25	50	75	100	125	150	S.F.
Power Factor	45	67	79	85	89	90	87
Efficiency	72.2	82.1	84.4	84.7	84.3	82.7	84.5
Speed	3575	3551	3526	3498	3466	3433	3479
Line amperes	1.03	1.25	1.55	1.91	2.31	2.79	2.15



Performance Graph at 460V, 60Hz, 1.5HP Typical performance - Not guaranteed values





APPENDIX L

BIOSPARGE SYSTEM MAINTENANCE REQUIREMENTS AND SPECIFICATIONS

			Α	KRF WC	<b>)#6247</b>						
PRIMARY VOLTS								AMPS		BREAKER SIZE	POLE
LOAD ID.	HP	WATTS	PHASE	VOLTAGE	*LARGEST MOTOR	AMPS	L1	L2	L3		
AIR SPARGE	7.5	-	3	230	27.5	22	27.5	27.5	27.5	30	3
AFTERCOOLER	0.33	-	3	230	-	1.9	1.9	1.9	1.9	15	3
EXHAUST FAN	0.33	-	1	120	-	5	5	-	-	15	1
LIGHTS	-	13	1	120	-	0.1	0.1	-	-	15	1
GFCI	-	-	1	120	-	5	-	-	5	20	1
CONTROLS	-	-	1	120	-	4	4	-	-	10	1
NOTES						LOAD BALANCE	38.5	29.4	34.4		
* LARGEST MOTOR IS FACTOR	ED @125% FOR	FLA PURPOSES	, ACCORDING T	O CODE CALCU	LATIONS						
							PRIMARY FLA:	38.5			
SECONDARY VOLTS								AMPS			
LOAD ID.	HP	WATTS	PHASE	VOLTAGE	LARGEST MOTOR	AMPS	 L1	L2	L3		
						LUAD BALANCE	0	0	0		
							SECONDARY				
							FLA:	0			



RM PARTS	DESCRIPTION	PRM#
PI-1	0-30 PSI LF GAUGE	PGCNBTY630251230PSI
PT-1	0-50 PSI TRANSMITTER	PT50PSI24VDCX
FI-1	0-5" WC DP GAUGE	DPGJH20005X
FT-1	0-5" WC DP TRANSMITTER	PGTLFMI005WCX
TI-1	32-400F TEMP GAUGE	THERMOBTY760552
TI-2	32-250F TEMP GAUGE	THERMOBTY760563
TT-1	0-395F TRANS	CONTD148WD

# SPARGE ELEVATION VIEW DETAIL

**GENERAL NOTES:** 



# **REMOTE SPARGE MANIFOLD ELEVATION DETAIL**



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PRM TO ASSEMBLE PLUMBING WITHIN THE BOUNDARIES OF THE 5' x 8' WALL. 2. PLUMBING MANIFOLD ARRANGEMENT WILL BE 2 x 2 WITH THE 5TH MANIFOLD BEING STAGGERED. 3. THE STRUTS AND CLAMPS ARE LINED TOGETHER TO STIFFEN EACH PIPE SECTION.

# PRM PARTS LISTS

DESCRIPTION	PRM #
0-30 PSI LF GAUGE	PGCNBTY630251230PSI
0-50 PSI TRANSMITTER	PT50PSI24VDCX
0-5" WC DP GAUGE	DPGJH20005X
0-5" WC DP TRANSMITTER	PGTLFMI005WCX
32-400F TEMP GAUGE	THERMOBTY760552
32-250F TEMP GAUGE	THERMOBTY760563
0-395F TRANS	CONTD148WD

DJECT NUMBER:	1	NO.	REVISION	DATE	DRAWING NUMBER:
NO-6247					
AWN BY:					M-3
MAM					



#### **INSTRUMENT IDENTIFICATION**

FIT-100/ SUFFIX (NOT NORMALLY USED) - SUCCEEDING LETTERS - FIRST LETTER

#### FUNCTIONAL ABBREVIATIONS

	OC	OPEN-CLOSE
	00	ON-OFF (MAINTAINED)
	ORP	OXIDATION REDUCTION POTENTIAL
	OSC	OPEN-STOP-CLOSE (MOMENTARY)
	SS	START-STOP (MONENTARY)
С	>	HIGH SELECT
T	<	LOW SELECT
ATIC		

PRESSURE SWITCH

TEMP SWITCH

#### **GENERAL INSTRUMENT SYMBOLS**

LOCALLY MOUNTED

FRONT-OF PANEL MOUNTED

BACK-OF-PANEL MOUNTED

PLC FUNCTION BLOCK

#### INSTRUMENT IDENTIFICATION TABLE

TTER			S	SUCCEEDING LETTERS								
E MODIFIER		READOUT OR PASSIVE FUNC	TION	OUTPUT FUNCTION	MODIFIE	R						
			ALARM									
					CONTROL							
	DIFFERE	NTIAL			DRIVE							
			PRIMARY ELEME	ENT								
	RATIO											
VAL)			GLASS									
						HIGH						
	RCAN		INDICATE									
	SCAN				CONTROL STATION							
			LIGHT (PILOT)			LOW						
ITY						MIDDLE						
			ORIFICE									
			POINT (TEST)									
	INTEGR/	ATE										
	OAFETY		RECORD OR PR	INT								
	SAFETY				TRANSMIT							
			MULTIFUNCTIO	N	TRANSMIT							
	VISCOSIT	Y			VALVE OR DAMPER							
			WELL									
			UNCLASSIFIED									
					RELAY OR COMPUTE							
					DRIVE, ACTUATE							
IECT NU												
10-62	047			NU.	REVISION		DA					
							-					
TUDI.												





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AKRF 440 PARK AVE SOUTH, 7TH FLOOR NEW YORK, NY 10016

CLIENT:

QUEENS ANIMAL SHELTER 151 WOODARD AVE., RIDGEWOOD, QUEENS, NY 11385

PROJECT TITLE:

SHEET TITLE: PROCESS & INSTRUMENTATION DIAGRAM - SPARGE 
 QUOTE #:
 PROJ

 7241
 W

 DATE:
 DRAW

 8/7/2020
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		₩	1/2"-CA-GAL	⊢⊫	₩-	Ţ	1/2"-CA-RUB		1"-CA-GAL	<b>⊢⊠</b> —	-N	CONNECTION TO WELLS
		≁	1/2"-CA-GAL	⊢⊫	⋈—	Ţ	1/2"-CA-RUB		1"-CA-GAL	<b>⊢</b> ⊠—	N	CONNECTION TO WELLS
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		, ▶+	1/2*-CA-GAL	⊢⊫		Ţ	1/2*-CA-RUB		1"-CA-GAL	<b>⊢</b> ⊠—	-N	CONNECTION TO WELLS
		-►-1	1/2"-CA-GAL	⊢⊫		Ţ	1/2*-CA-RUB		1"-CA-GAL	⊢⊠—	-N	CONNECTION TO WELLS
CA-GAL		-►-1	1/2"-CA-GAL	⊢⊫	⋈—	Ţ	1/2*-CA-RUB		1"-CA-GAL	⊢ൽ—	N	CONNECTION TO WELLS
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		, →	1/2"-CA-GAL	⊢⊫	₩		1/2*-CA-RUB		1"-CA-GAL	<b>⊢</b> ⊠—	-N	CONNECTION TO WELLS
			1/2* CA CAL		M		1/2* CA DUR	PI	15 CA CAL	<b>T</b>	N	CONNECTION TO WELLS
			1/2 "GARGAL				1/2 °CANOB	PI	THURIDAL	.T.		
CA-GAL	<u> </u>	<b>→</b> + ,	1/2"-CA-GAL	μ	-M		1/2*-CA-RUB	PI	1"-CA-GAL	⊢)#(]—	-N	CONNECTION TO WELLS
		-►-1	1/2"-CA-GAL	⊢⊫		Ţ	1/2*-CA-RUB	(PI)	1"-CA-GAL	⊢ <b>™</b> —	-N	CONNECTION TO WELLS
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		₩	1/2*-CA-GAL	⊢⊫	⊸⊠	\ ☐	1/2*-CA-RUB		1"-CA-GAL	⊢ <u>r</u> a—	N	CONNECTION TO WELLS

JECT NUMBER:	NO.	REVISION	DATE	DRAWING NUMBER:
VO-6247				
WN BY:				P&ID-2
MAM				



Howard NicholsSite Name Queens Animal ShelterAKRFSite Location Queens, NY440 Park Ave South, 7th FloorProject #New York, NY 10016Site Location Queens, NY

# Type of System: Packaged Air Sparging System Full system controls, turnkey construction

Dear Howard

Thank you for giving PRM the opportunity to provide this quotation. This quotation has been prepared according to the specifications and submitted drawings provided by your company. Please take time to review the quotation thoroughly. The quotation may include deviations from the original specifications. Deviations typically are a result of PRM incorporating a change to improve system operation. By accepting this proposal for review and in the event that your company contracts with PRM to provide equipment quoted in this proposal, you accept those deviations as quoted. In the event that deviations are not acceptable, please contact PRM for a revised quotation.

If you have any questions regarding this proposal, please give us a call.

Respectfully submitted,

Mel Phillips President/PRM



#### Product Recovery Management, Incorporated NORTH CAROLINA: 200 20th Street, Butner, NC 27509 (919) 957-8890

FLORIDA: 3420 Rey nolds Road, Lakeland, FL 33803 Toll Free: (888)-PRM-WILL NEW YORK: 1748 Kennedy Road, W ebster, NY 14580 (585) 217-9134



PRM proposes to provide a fully packaged remediation system for your project in accordance with the design specifications. The equipment is itemized in the written proposal below

#### Air Sparge System

 Eurus MD-3004 PD blower direct driven by 7.5 Hp TEFC 3 phase motor (4.65 BHP req'd) and speed controlled via 7.5 Hp VFD to allow operation in direct drive mode with no belts to wear or squeal. Motor is oversized to allow for expansion or higher pressures if needed and to provide a safety factor. System is oilless and utilizes ~ ½ of the power required of oilless piston compressors and similar power to that of the specified 5 Hp GAST unit.



- Includes inlet filter/silencer and discharge silencer.
- Pressure gauge and Temperature gauge on discharge prior to aftercooler, temp gauge post aftercooler
- AKG CC100-3 aftercooler with vent duct to exterior
- 2" Orifice plate and differential pressure gauge flowmeter
- Pressure and temp transmitters post aftercooler
- Piping and fittings to connect to manifold

#### Air Sparge Manifolds

- 5-way 2" x 2" Galvanized manifold each leg with manual ball valve. These 5 legs are manifolded with galv piping out to (5) ½" manifolds each with either 5 legs or 4 legs for a total of 23 legs
- Each of these 23 legs will consist of the following equipment:
  - 1/2" Ball valve
  - 1/2" SS needle valve for flow control
  - 0 50 psi liquid filled pressure gauge
  - 0.3-3 cfm Rotometer
  - ½" Check valve
  - Sparge lines terminate at manifold. PRM can extend thru the enclosure or client can route piping into enclosure from base to avoid add'l connections



#### **TOLL FREE (888)-TREAT-IT**

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## Enclosure

- System Enclosure for equipment estimated as 72" W x 72" H x 36" D and includes aluminum skid base and anchoring provisions. Note the image below is typical of such a system enclosure, although typically white or beige.
- Skid will include:
  - Forklift Pockets
  - Bolt down tabs
- Sound attenuation insulation on interior walls/ceiling which also includes sound baffled vents and sound dampening hoods.
- Thermostatically controlled exhaust fan. Temp set point on HMI.
- LED light w/ switch on HMI
- Wall vents for proper ventilation.
- Enclosure to be rated and wired for standard dry commercial location.
- Includes full fabrication of treatment system, including plumbing, electrical, and thorough testing as well as labeling.



# **Electrical Service**

• PRM has placed all circuit breakers in the main control panel. Electrical contractor is responsible for providing 120/230V, 3 phase 60A service feed to our panel as well as any add'l disconnecting means required.



## SCADA Interface

PRM uses a program interface that is accessible locally or remotely through our secure internet connection. PRM has thousands of connected SCADA interfaces in the field and the interface below is a typical representation of a typical remediation system.

These images can be seen publicly at this link: <u>scada images</u>. PRM has the flexibility to customize per client request.



#### Product Recovery Management, Incorporated

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# **Control Panel**

- NEMA 4 3rd Party Listed Industrial Control Panel per UL508A. Panel is mounted on the enclosure and pre-wired to all components. Panel will contain deadfront to prevent unauthorized tampering.
- All lights and H-O-A switches are virtual on the HMI
- Breakers for all equipment provided by PRM included in the control panel
- Contacts and relays as required
- Contactors and thermal overloads for compressors, aftercooler and exhaust fan
- Siemens S7-1200 Series PLC with color HMI screen and modem/router
  - 1st year of telemetry included. \$897.60 annually thereafter
  - System will e-mail and/or text all alarms
  - All system data is datalogged and accessible remotely for download
  - See options for surge protection for discrete and analog signal lines to/from the PLC as well as for basic lightning protection
- UPS/Surge protection included to protect PLC/HMI and allow notification upon power failure

#### MISC

- Delivery will be via truck and will need to be offloaded by others
- PRM will provide full and detailed submittal package prior to construction. Submittal will include at a minimum a description of the system, controls, and system logic, cut sheets for all equipment,
- Price includes full and detailed system testing prior to delivery.
- 2 copies of system manuals will be provided as well as a digital version. Includes all drawings, equipment/part numbers, manufacturer instructions, replacement part numbers, description of the system, controls, and system logic, electrical drawings for the controls and preventative maintenance info
- Comprehensive written 1 year warranty provided on materials and workmanship.
- See option for onsite start up and training.



# Product Recovery Management, Incorporated

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# Power at the above referenced facility can be either (please specify):

[ ] 120/240V single phase	[X ] 120/208V three phase WYE
[X] 120/230V three phase CLOSED DELTA ONLY	[X] 120/240V three phase CLOSED DELTA ONLY
[ ] 277/480V three phase	[ ] 480V three phase

Please note that a system connected to an open delta electrical system can cause warranty issues. Please see Warranty disclaimer below. Warranty issues are at the discretion of PRM.

End of written proposal. Please see attached warranty disclaimer and security agreement. If your project payment schedule includes progress payments, then a security agreement may not be required. The written security agreement is intended to reserve PRM's right of ownership of the equipment in the event of a default of payment due to bankruptcy or some other unforeseen event. A security agreement is required in order for PRM to file for a UCC for the equipment.

We have quoted prices with terms that we feel best represent the client's needs based on review of the request. PRM can offer flexible alternative payment terms on the project based on customer request with terms up to 270 days. Note that if PRM has provided progress payment terms, these terms are structured to offer the client the best overall value as we have reduced pricing and not included any financing terms for the project. Extended payment terms do incur pricing increases due to the cost of PRM internally financing projects for customers due to the cost of carrying money for these durations. If we have quoted with terms that you prefer to change, please contact your sales agent to discuss. Note that extended terms are typically offered on State or Federally funded projects where the funding structure is such that extended terms may be required.

#### \*\*\*\*\*\*\*\*\*IMPORTANT\*\*\*\*\*\*\*\*

Upon taking receipt of equipment that has physical signs of damage, it is the responsibility of the client to document that damage on the Bill of Lading at the time of receipt of the equipment. In the event that the Bill of Lading is not properly marked and the damage is visible, PRM has no ability to make a claim against the carrier and thus the recipient would become responsible for all charges of damage repairs. The client must also notify PRM Corporate headquarters in writing within 24 hours with a written description of all damage as well as digital images of the damage. PRM selects the best carriers in the nation to do our transporting however there is always potential for damage, especially on longer journeys. Our carriers all carry freight damage insurance which we can make claims against, but only if we follow the rules and the most critical rule is that the damage must be documented on the Bill of Lading at receipt of the equipment

FLORIDA: 3420 Rey nolds Road, Lakeland, FL 33803 Toll Free: (888)-PRM-WILL NEW YORK: 1748 Kennedy Road, Webster, NY 14580 (585) 217-9134



#### SYSTEM PRICING

DESCRIPTION	PRICING
REMEDIATION SYSTEM PRICE	\$38,715.00
SYSTEM DELIVERY	\$1,500.00
SYSTEM STARTUP (Option)	\$ See Option Price
SALES TAXES (8.875%)	\$ 3,569.00
TOTAL	\$43,784.00

Shipping is always estimated at the time of the quote. Due to volatile fuel costs during the past decade, PRM reserves the right to adjust shipping prices based on the national average fuel cost at the time of delivery vs. at the time of the quote.

Any purchase authorization must include PRM's signed/completed acceptance form (below) and a signed PRM Security Agreement as furnished by PRM.

Lead time is determined at time of order, but is typically 10-12 weeks from receipt of approved submittals.

# PAYMENT TERMS: <u>25% Down payment, 50% Due prior to delivery, 25% Net 30 days</u>

#### Reviewed and Accepted By:

#### Date:

#### Purchase Order #:

This agreement can be faxed to this office at 919-957-7230 to initiate the order. The original signed copy must be mailed to our North Carolina Corporate office at: PRM Attention: Luke Kemp 200 20th Street

Butner, NC 27509

#### Product Recovery Management, Incorporated

NORTH CAROLINA: 200 20th Street, Butner, NC 27509 (919) 957-8890 FLORIDA: 3420 Rey nolds Road, Lakeland, FL 33803 Toll Free: (888)-PRM-WILL NEW YORK: 1748 Kennedy Road, W ebster, NY 14580 (585) 217-9134 **TOLL FREE (888)-TREAT-IT** 



#### **Options**

Please circle YES or NO for each option . <u>Option prices DO NOT include sales tax</u>. Options are not necessarily upgrades, they are listed as alternatives. It is up to the engineer working for you to make the ultimate decision that the option chosen is in your best interest. Options chosen may be an invalidation of strictly following a Request for Proposal or a Specification. You accept this option as an approved alternative to the specification. PRM provides the options typically to enhance the system.

#### Option 1 -- YES NO

Provide UL certification listing of the entire package. Include di-electric testing of the entire package and application of the UL listing. PRM recommends for ease of permitting. The certification process adds validity and compliance and mitigates liability for all parties involved.

Add \$1,00.00

Option 2 -- YES NO Provide surge suppression for all 4-20mA and discrete I/O to the PLC system. Add \$475.00

Option 3-- YES NO PRM to provide senior technician for 1 full day on-site start-up and operator training Add \$3,550.00

Please recycle and do not print this document unless necessary. PRM is committed to limiting waste generated due to wasteful printing. If you do decide that it is necessary to print this document, please act accordingly and recycle all discarded paper.



NEW YORK: 1748 Kennedy Road, Webster, NY 14580 (585) 217-9134



#### WARRANTY DISCLAIMER

Product Recovery Management (PRM) will warrant all new equipment manufactured by PRM to be free of defects in materials and workmanship for a period of 1 year from the date of manufacture as established by PRM provided the following conditions are met:

- 1. Equipment must be operated and maintained in accordance with the guidelines established in the O&M manual(s) provided with the equipment or with the individual Equipment O&M manuals... This includes the site specific manual as provided by PRM as well as the individual component manuals provided.
- 2. Warranty service shall not be applicable unless a complete logbook of routine maintenance is kept and provided to PRM upon request. For warranty coverage to be ensured,, PRM requires that O&M logs be sent to PRM staff quarterly so PRM can confirm previous maintenance, not after a warranty claim.
- 3. Warranty service shall not be applicable unless all outstanding invoices which are over terms are paid in full.
- 4. PRM will not warrant electrical equipment that is operated on an Open Delta electrical system. The only power to be used with PRM supplied equipment will be either a "Y" or a "Closed Delta". Proper engineering design would accommodate the correct electrical provisions in the engineering specification. PRM will not be liable for any changes to the electrical supply and distribution system that are required to bring the electrical system(s) to these standards.
- 5. For skidded equipment, PRM is not responsible for warranty of equipment that is not provided protection from the elements such as direct sunlight, rain, hail or other weather conditions exerted by nature. It is a generally accepted practice that skids placed outdoors should be provided physical protection from the elements. An example of potential damage is direct sunlight during summer months. Motors may be designed for certain maximum operating temperatures but without physical protection, motor temperatures may exceed recommended temperatures which causes damage such as accelerated grease degradation in motor bearings. This is one of the major cause of motor failures in the elements.
- 6. PRM shall not be responsible for consequential damage that may occur due to direct or indirect damage caused by a failure of another piece of equipment.
- Technicians should be duly trained and have a good understanding of electrical, and mechanical systems. Failure to have a properly trained technician work on PRM supplied equipment can result in invalidation of the warranty at the discretion of PRM.
- 8. PRM typically manufactures equipment/systems to client provided specifications. Failures due to a design problem by the client which can be identified as a design issue that led to the failure may be disclaimed by PRM under our standard warranty.
- All equipment quoted as pre-wired and pre-plumbed has been done so by trained personnel. PRM has been instrumental in conformity to State and Federal Codes. If local codes vary from Federal and State Codes, it is the client's responsibility to notify PRM of particular requirements in the bid request that may necessitate changes to the proposed system.
- 10. Delivery must occur within 2 weeks of completion of testing by PRM or storage fees of \$250.00 per week may be charged by PRM due to inconvenience of storage and location requirements. The fee may be larger for systems over \$100,000.00.
- 11. Electrical work for this quotation is in accordance with the most current version of the National Electrical Code (NEC).
- 12. This bid may be for equipment only and proposed startup. This quotation does not include pricing for installation, wiring or plumbing unless explicitly stated herein.
- 13. This quotation is not subject to subcontractor contract. PRM shall act as an equipment vendor.
- 14. General warranty is for parts. In the event of a component failure that is covered under warranty PRM will provide the repair components/parts at PRMs discretion under warranty. Shipping of replacement components is to be paid for by the client. It is understood that the client will provide the labor to replace warranted parts. It is understood that all shipping for all warrantable items are to be shipped most cost effective way unless client requests expedited shipping. If expedited shipping is requested, it is understood and agreed that PRM will invoice for all shipping charges which will be paid for by client in a timely manner.
- 15. PRM is typically engaged in system startups and for many clients O&M activities. PRMs general rate for service technicians is \$95.00 per hour and \$115.00 per hour for engineer level senior technicians. In the event a scheduled event has delays that are no fault of PRMs, PRM shall be able to invoice for overage time which may happen on startups or other service activities. Additional fees such as daily per diem and truck/mileage fees are applicable as well as parts purchased which require reimbursement plus markup. Also it is understood that PRM will be compensated in the event weather or other delaying occurrences occur that may require to procure special vehicles to perform a duty. An example would be to do a startup activity for a project in adverse weather condition where cold weather and snow may require PRM to secure a 4WD truck to do startup. It should be expected by the client that additional fees will be invoiced to cover additional expenses. It should also be considered acceptable for adverse weather to cause additional labor charges for site work as travel delays and slower sitework conditions would be expected to cause slower safe progress. It should also be understood that PRM always considers employee safety first. This means that PRM reserves the right to hold back and delays shipments.
- 16. For equipment being shipped into NC, FL, NY and VA, the appropriate sales and use tax has been included if shown on the quote and will be paid by PRM to the state taxing authority. For equipment going to all other states, it is the customer's responsibility to pay any required sales and use taxes to their appropriate taxing authority. For bid comparisons, it is important that taxes be added to any bids from out of state to provide funds for payment of the taxes due.

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# **PAYMENT TERMS**

Payment terms are established on the pricing page. Service Charges of 1.5% per month will be charged on all overdue invoices. If PRM is required to bring legal action to enforce this agreement, the prevailing party shall be entitled to its reasonable attorney fees.. This agreement shall be governed by and construed in accordance with the laws of the State of North Carolina and venue shall be proper and personal jurisdiction had in state court, Durham County, North Carolina. Above payment terms are contingent upon receipt by PRM of original signed quote as well as the original signed security agreement.

# **TECHNICAL SUPPORT**

In the event of a problem or failure, immediately contact PRM's corporate office and request technical assistance. Please make sure that you have the PRM Project Number available. A technician will assist in determining if the equipment is operating properly and if not, then PRM will guide the onsite technician in proper settings and adjustment. PRM technical phone support is billable at a rate of \$95.00 per hour at the discretion of PRM. Purchase of a system from PRM and initiation of phone support constitutes a legal agreement that PRM can invoice for phone support.

# **RETURN AUTHORIZATION**

If a component failure has occurred, PRM will ship a replacement part to the site or client office for replacement of the failed part by the Client. PRM will not be responsible for labor to replace the failed part. PRM will issue an RMA upon determination that a replacement part is necessary. PRM will invoice for the part and credit will be issued for the part only once the defective part is returned to PRM and PRM makes a determination that the part is defective at no fault of the client and within the warranty period.

# STARTUPS

PRM recommends that all systems be ordered and that the client pay PRM to provide a day or two of startup training. In order for PRM to warranty an oxidizer system, it is a requirement that the client receive training from PRM. Only technicians that are duly trained by PRM should operate an oxidizer due to the potential risk and liability of improper operation. In no event shall PRM be liable for any consequential accidents, property damage, personal injury or death occurrences that may happen due to improper operation of an oxidizer.

# **DELIVERY ACCEPTANCE & CLIENT RESPONSIBILITIES**

Buildings and systems that arrive may arrive to the project site tarped or with provisions to protect roofing and such parts. It is the client's responsibility to remove these items upon arrival. All fasteners installed to retain the materials must also be removed. If the client has a contractor doing the site installation work, PRM recommends that they ensure that the contractor handle these items.

# SECURITY AGREEMENT

See the security agreement document on the following pages. If this project is a State or Federally funded project where the client has asked PRM to extend payment terms for the project beyond Net 45 days, PRM will require an executed security agreement. This agreement is a simple document that gives PRM ownership/entitlement to the equipment until PRM is paid for the equipment. This document protects PRM in the event a client should default on payment.





#### SECURITY AGREEMENT

, a \_\_\_\_\_\_, corporation (the "Debtor"), hereby grants to PRODUCT RECOVERY MANAGEMENT, INC. (the "Secured Party") a security interest in all of Debtor's right, title and interest, now or hereafter acquired until entire debt secured by this agreement is paid in full, in the follow ing **Collateral** (the "Collateral"):

- **a.** Remediation Equipment. All remediation equipment, supplies, fittings, machinery, and other tangible personal property, in all of its forms and including fixtures, for PROJECT, located in \_\_\_\_\_\_, sold to Debtor by the Secured Party together with all parts, instruments, substitutions, replacements, additions, accessories, fittings, operating manuals, plans, specifications, and tools (the "Remediation Equipment"); and
- b. **Proceeds and Products.** All proceeds (including without limitation any rents, royalties, insurance proceeds, replacements, additions, and accessions thereto) and products of the Remediation Equipment.

THIS SECURITY AGREEMENT (the "Agreement") SECURES: (i) the Debtor's payment to the Secured Party for the Remediation Equipment under the purchase order and/or other contracts or agreements providing for Debtor's purchase of the Collateral (the "Contracts"); and (ii) all costs reasonably incurred by Secured Party to enforce this Agreement, and to maintain and preserve the Collateral, including without limitation all taxes, assessments, insurance, reasonable attorneys' fees, legal expenses, and expenses of sale, together with interest thereon, at a rate not greater than 18% per annum, pursuant to the follow ing TERMS:

THE DEBTOR: bears the risk of loss; shall keep the Collateral insured for the full amount secured by this agreement at all times and at Debtor's cost; shall repair and maintain the Collateral at Debtor's cost and shall not use the Collateral or any part of it in a manner resulting or likely to result in waste or unreasonable deterioration of the Collateral; shall pay all taxes and assessments on the Collateral as they become due and shall keep the Collateral otherw ise unencumbered; shall keep the Collateral separate and identifiable from other property ow ned by Debtor or located on the same premises as Collateral; shall not, without prior written consent from Secured Party, sell, lease, or otherw ise dispose of any portion of the Collateral; w aives the automatic stay under 11 U.S.C. Section 362; and shall promptly execute and deliver all further instruments and documents and take all action reasonably requested by Secured Party from time to time in order to perfect and protect the security interest granted in this Agreement or to enable Secured Party to exercise its rights hereunder.

THE SECURED PARTY may: file one or more financing statements, continuation statements, or amendments relative to the Collateral without the signature of the Debtor, where permitted by law; enter the premises where the Collateral is located and inspect the Collateral, either in person or by its agent, at any reasonable times and at reasonable intervals; and exercise any of the rights hereunder or pay any unpaid taxes or other obligations of the Debtor with regard to the Collateral without w aiving or releasing the Debtor from any of its duties or obligations under the Contracts, provided that the Secured Party shall not be obligated to perform any of the Debtor's obligations under the Contracts or to take any action to collect or enforce any claim for payment hereunder, and that such failure to collect or enforce shall not be deemed a w aiver of said rights, a w aiver of Debtor's obligations.

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EVENTS OF DEFAULT. The following shall constitute events of default: Debtor's failure to pay when due any obligation secured by this Agreements under the terms of the Contracts; Debtor's breach of any affirmative covenant or other term hereunder; and/or Debtor's disposition of the Collateral in violation of this Agreement shall constitute an event of default hereunder.

REMEDIES. If an event of default shall occur, Secured Party shall have all the rights and remedies afforded a secured party by law, including all the rights and remedies of a secured party on default under the Uniform Commercial Code (the "Code") (w hether or not the Code applies to the affected Collateral), and may also: (a) enter on Debtor's premises to take possession of the Collateral; (b) take immediate possession of the Collateral, w herever found, with or w ithout legal process; (c) require Debtor to assemble the Collateral and make it available to Secured Party at a place designated by Secured Party that is reasonably convenient to both Debtor and Secured Party; and (d) apply the proceeds received from the sale or other disposition of the Collateral on default of Debtor to the payment of reasonable attorneys' fees and legal expenses incurred by Secured Party as a result of Debtor's default, in addition to those purposes provided for by law.

GENERAL PROVISIONS. Time is of the essence. Neither this Agreement nor the Debtor's obligations to the Secured Party are assignable without the prior written consent of Secured Party, although the Secured Party may assign this Agreement on written notice to the Debtor. This Agreement shall not be amended except by written instrument signed by the party to be bound, and the provisions herein are severable. Venue and jurisdiction over any disputes and parties hereto shall be proper in North Carolina. The validity, interpretation, and performance of this Agreement shall be governed by and construed under the law s of the State of North Carolina.

DATED:	DEBTOR:	, a	Corporation
	Ву	, Its	

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