SESI
CONSULTING
ENGINEERS

REMEDIAL ACTION WORKPLAN

For:

Cottage-Garden Auto Repair Site
30 Garden Street and 16 Cottage Place
New Rochelle, New York
(BCP# C360180)

Prepared for:

The Mark 95 LLC & The Mark 95 II LLC
SDC Garden Street Member LLC, and
MJ Garden LLC
1955 Central Park Avenue
Yonkers, New York 10710

Prepared by:

SESI CONSULTING ENGINEERS, D.P.C.
12A Maple Avenue
Pine Brook, NJ 07058

SEPTEMBER 2019 (REVISED NOVEMBER 2019)

CERTIFICATIONS

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

Fuad Dahan	11/15/2019	
NYS Professional Engineer (# 090531)	Date	Signature

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education.

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Acronym	Definition
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below ground surface
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
cy	Cubic yard
DER	Division of Environmental Remediation
DER-10	NYSDEC Technical Guidance for Site Investigation & Remediation
DUSR	Data Usability Summary Report
ECs	Engineering Controls
ECL	Environmental Conservation Law
ESA	Environmental Site Assessment
FER	Final Engineering Report
ICs	Institutional Controls
MSL	Mean Sea Level
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PHC	Petroleum Hydrocarbon
PID	Photoionization Detector

Acronym	Definition
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RECs	Recognized Environmental Concerns
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objectives
SESI	SESI Consulting Engineers, DPC
SMP	Site Management Plan
SVOCs	Semi-Volatile Organic Compounds
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TOGS	Technical and Operations Guidance Series
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds
WCDOH	Westchester County Department of Health

Executive Summary

The Mark 95 LLC and The Mark 95 II LLC, SDC Garden Street Member LLC, and MJ Garden LLC (together herein referred to as the "Volunteer") entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) to investigate and remediate the Cottage-Garden Auto Repair Site (herein referred to as the "Site") an approximately 0.98 acres Site located in the City of New Rochelle, Westchester County New York (Site # C360180). The proposed project for the Site includes a mixed-use project.

The Site has been impacted by historical operations associated with a former gasoline station, a small Plastic Works manufacturing facility and Strip-A-Way of New Rochelle, Inc. The Site also had a former auto repair shop and has historic fill.

This Remedial Investigation Report (RIR) summarizes the results of prior investigations and the Remedial Investigation (RI) performed on the Site. The RI was conducted in general accordance with the Remedial Investigation Work Plan (RIWP) for the Site, which was last revised April 29, 2019, and subsequently approved by the NYSDEC in May 3, 2019, the and Supplemental Remedial Investigation Work Plan (SRIWP) September 13, 2019, and approved by NYSDEC on September 20, 2019, and the NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10).

The RI consisted of collecting ninety two (92) soil samples, six (6) groundwater samples, and fifteen (15) soil vapor samples. Soil samples were collected for the investigation of Recognized Environmental Concerns (RECs) that were identified during a Phase I ESA Reports prepared by DRE, and SESI's review of the Site history and field observations. The RECs include a former tire store that was a former gasoline station at Cottage Place with two (2) 3,000-gallon gasoline underground storage tanks (USTs) which were closed in place; a small plastic works manufacturing facility at the 26 Garden Street parcel; and a company called Strip-A-Way of New Rochelle, Inc., at 26 Garden Street. Samples were analyzed for a combination of full target compound list (TCL) and target analyte list (TAL) analytes – which include volatile organic compounds (USEPA Method 8260), metals (USEPA Methods 6010/7471), semi-volatile organic compounds (USEPA Method 8270), PCBs and pesticides (USEPA Methods 8081/8082), and PFAS (USEPA Method 537), and 1,4 dioxane (USEPA Method 8270). Duplicates were included each day sampling was conducted, and trip blanks accompanied all samples analyzed for volatile

organic compounds (VOCs).

Based on the field investigation, the overall depth of impacted soils ranged from 2 feet to 24 feet (ft) below ground surface (bgs). Polycyclic aromatic hydrocarbon (PAH) impacts exceeding both Unrestricted Use Soil Cleanup Objectives (USCO) restricted residential soil cleanup objectives (RRSCOs) were identified in shallow soils 2 to 3.5 ft bgs on the western 2/3rd of the Site. Metals contaminated soils exceeding the RRSCOs were identified in shallow soils 2 to 3 ft bgs. Metals contaminated soils exceeding the USCO extends down to 24 ft bgs in certain areas. Pesticides impacted soils were identified in shallow soils in one area near the northeastern portion of the Site.

The Site's groundwater is impacted with VOC and PAH petroleum compounds above NYSDEC Technical Operational Guidance Series (TOGS) 1.1.1 GA Ambient Water Quality Standards (AQWS) groundwater standards as a result of the historical land uses.

The Site soil vapor resulted in chlorinated VOCs (CVOCs) and petroleum hydrocarbon (PHC) VOCs. The greatest concentrations of CVOC in soil vapors identified as trichloroethylene (TCE) were detected in SV-6 (810 ug/m^3), SV-7 (260 ug/m3), SV-9 (77 ug/m3) and carbon tetrachloride in SV-5 (630 ug/m^3) near the southern portion of the Site. The greatest concentration of PHC VOCs in soil vapors were identified as benzene in SV-3 (120 ug/m^3) and SV-5 150 (ug/m^3), toluene at 130 ug/m^3 in SV-11 and SV-15, 140 ug/m^3 in SV-14, and SV-4 to 190 ug/m^3 in SV-5. Total xylenes were detected at concentrations of 43 ug/m^3 in SV-1, 46 ug/m^3 in SV-5, 69 ug/m^3 in SV-15, and 159 ug/m^3 in SV-7. Finally, 1,3 butadiene was detected at concentrations ranging from 1.8 ug/m^3 in SV-15 to 250 ug/m^3 in SV-1.

1.0 INTRODUCTION

The NYSDEC has entered into a Brownfield Cleanup Program (BCP) Agreement BCA Index No. C360180-11-18 for the site known as Cottage-Garden Auto Repair Site (BCP Site. # C360180) ("Site") with BCP Volunteers The Mark 95 LLC & The Mark 95 II LLC, on January 16, 2019. SDC Garden Street Member LLC, MJ garden LLC, MJ garden II LLC, MJ garden III LLC, and MJ garden IV LLC were added to the BCA per the executed amendment on 9/9/19. The Site is located at 30 Garden Street and 16 Cottage Place also formerly known as 10 Cottage Place, and 25 and 26 Garden Street), New Rochelle, New York. SESI (SESI) Consulting Engineers have prepared this Remedial Action Work Plan (RAWP) for the remediation of the Site on behalf of the Volunteers. This RAWP includes an analysis of the remedial alternatives available to remediate the contamination as reported in the Remedial Investigation Report (RIR) revised October 2019 and then selects a preferred remedy.

The RI was completed in accordance with the NYSDEC DER-10, to provide a systematic assessment of environmental conditions on the Site. The RI defines the nature and extent of contamination on-site, identifying contaminant source areas, and producing data of sufficient quantity and quality to complete an on-site exposure assessment and a qualitative off-site exposure assessment for purposes of designing the remedial action for the Site.

A formal Remedial Design Document will not be prepared as the remedy for this Site entails principally a site-wide source removal effort in order to achieve a Track 1 Unrestricted Use remedy.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located at 30 Cottage Place and 16 Garden Street in the City of New Rochelle, New York. The Site includes Tax Map/Parcels Numbers: 3-802-0032; 3-802-0036; and 3-802-0038. The Site is approximately 0.98-acres, which has been historically utilized for residential, commercial and manufacturing purposes. **Figure 1.1** presents a Site Location Map.

The Site was formerly occupied by four commercial buildings and one residential building. All the buildings have been demolished down to their foundations. The residential parcel on 16 Cottage Place was a two and a half story apartment building with approximately 1,000 sq. ft. of formerly occupied space. The residence was constructed as a residential single-family home in the early 1900's, with conversion to multiple apartments over the years, based on information from available records. The last business with an address of 10 – 12 Cottage Place was a retail tire and auto repair facility present on the Site for over 60 years. This portion of the Site was also a gasoline station with underground tanks abandoned in place and prior uses are unknown. Commercial businesses were also present on the Site with prior addresses of 28 Garden Street and 34 Garden Street including a kitchen and bath dealer and other warehousing purposes. 26 Garden Street housed a Plastic Works manufacturing company called Strip-A-Way of New Rochelle Inc.

According to the United States Geological Survey (USGS) Mount Vernon NY, 2013 topographic map, the Site's average topographic elevation is approximately 91-feet above mean sea level (msl). The topographic map indicates that the topography at the Site is relatively level and is located in an urban area.

There are no surface water bodies or streams on or directly adjacent to the Site. SESI did not observe any areas suspected to be wetlands on the Site. Storm water drainage patterns are generally consistent with the surrounding topography and primarily flow to the east toward Echo Bay.

Figure 1.2 presents a Site Plan and the Brownfield Boundary.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed Site development includes a mixed-use project including commercial space, Westchester County courthouse, and affordable housing residential units.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The adjacent area is primarily highways with a mix of commercial and residential properties.

Direction	Adjacent Property
North	Cottage Place, A Commercial Office Building and Veterinary Center across Cottage Place
South	Garden Street and Commercial Buildings Across Garden Street
East	Garden Street, Parking Lot and Railroad Tracks
West	I-95 New England Thruway

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation/Interim Remedial Measure Workplan (RI/IRMWP), which was approved by the NYSDEC on May 3, 2019 the and Supplemental Remedial Investigation Work Plan (SRIWP) September 13, 2019, and approved by NYSDEC on September 20, 2019. The investigation was conducted during May 2019 and September 2019. The RIR is submitted to NYSDEC and New York State Department of Health (NYSDOH) with this submission in a separate report.

2.1 PREVIOUS INVESTIGATIONS

The following environmental reports are attached in **Appendix A**:

A. Phase I Environmental Site Assessment, 26, 34 Garden Street & 10, 16 Cottage Place, prepared by DRE Environmental, Inc., October 2016;

B. Phase II Environmental Site Assessment Report, Garden Street & Cottage Place, prepared by SESI, July 2018;

C. Remedial Investigation/Interim Remedial Measures Workplan, Garden Street & Cottage Place, prepared by SESI, January 2019, Revised April 2019.

The following RECs were identified in the Phase I ESA Report prepared by DRE and SESI's review of the Site history:

- **REC 1: Former gas station with two (2) 3,000-gallon Underground Storage Tanks remaining in place.**

The corner property on Garden and Cottage, previously a tire store, was also a former gasoline station. There are two abandoned 3,000-gallon gasoline USTs which were closed in place in prior to 2000, and a former 1,000-gallon heating oil UST which was removed in 2001. The heating oil UST was reportedly cleaned, removed and observed by the City of New Rochelle Fire Department. The heating oil UST removal reportedly included collection of samples, and no petroleum compounds were detected in the soils. Soil borings were conducted around the two abandoned gasoline USTs. DRE reports they showed no evidence of petroleum compounds on the sides of these abandoned tanks.

The Phase I report then states that a person named Ira Conklin collected soil samples in 2001 on four sides of the abandoned gasoline USTs and found no indication of petroleum products in the soil. There is no documentation on the closure of the two gasoline USTs. The soil beneath the USTs was not tested for petroleum compounds and no records are known to exist on the closure or condition at the time of closure. As such there is a potential for residual petroleum to have impacted the soils beneath the USTs. These gasoline USTs will be removed in accordance with the procedures discussed in Section 3.4 of this RAWP.

- **REC 2**: **Additional Manufacturing Activities on the Site.**

DRE reported that the Site's only historic use that could have resulted in contamination was the former gas station. However, a photo in the report reveals a small Plastic Works manufacturing facility at the 26 Garden Street parcel. A company called Strip-A-Way of New Rochelle, Inc. was located at 26 Garden Street for 20 years from 1980-2000. TCE vapor was found in the vicinity of this portion of the Site. Therefore, it is suspected that this facility may be the source of the TCE vapor contamination as a result of the stripping operations that may have occurred in relation to the Strip-A-Way of New Rochelle, Inc. business located there.

- **REC 3: Historic Fill.**

There are higher than normal levels of metals in the soils. The source may be linked to former auto repair uses or may be the result of historic fill.

The locations of the above RECs are presented in **Figure 2.1**.

2.2 SUMMARY OF REMEDIAL INVESTIGATIONS RESULTS

For purposes of evaluating the remedial alternatives associated with the proposed Site redevelopment, the analytical results of the soil samples were compared to the NYSDEC USCOs and RRSCOs. The constituent concentrations in groundwater were compared to the applicable AWQS.

2.2.1 SOIL/FILL CONTAMINATION

A total of ninety two (92) soil samples were collected from twenty six (26) soil borings (SB-9 through SB-34). The borings were advanced utilizing direct-push and hollow stem augur drilling techniques. Borings were advanced to depths ranging from 12 to 24 ft bgs. The soil boring locations are shown on **Figure 2.2**. Soil samples were collected from each boring at depth intervals, which appeared to be most contaminated based on visual observations, PID readings and olfactory observations. Soil samples were analyzed for full suite TCL/TAL + 30, 1,4-dioxane and per and polyfluoroalkyl substances (PFAS). This soil sampling program was implemented to determine if a Track 1 unrestricted use remedy can be achieved. Boring logs documenting soil classifications, PID readings, and visual observations are included in **Appendix B**.

PAHs including benzo[a]anthracene, benzo[b]fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were identified in three samples from three soil borings, S-11 (2-2.5), S-19 (1.5-2) and S-25 (2.5-3) at concentrations that exceed their USCO and/or their RRSCO. The depth of PAH impacts is within 3 ft-bgs. A summary of soil samples with PAHs exceeding the USCOs and RRSCOs are presented below.

Summary of PAHs Exceeding the NYSDEC USCO and RRSCO

Analyte	Part 375-6.8(a) USCO	Part 375-6.8(b) RRSCO	S-11 (2-2.5)	S-19 (1.5-2)	S-25 (2.5-3)
SOIL BY 8270D (MG/KG)					
Benzo[a]anthracene	1	1	**0.81**	**2.0**	**1.0**
Benzo[a]pyrene	1	1	0.78	**2.0**	**1.2**
Benzo[b]fluoranthene	1	1	**1.2**	**3.2**	**1.9**
Benzo[k]fluoranthene	0.8	3.9	**0.41**	**1.3**	**0.63**
Chrysene	1	3.9	**0.96**	**2.3**	**1.2**
Dibenz(a,h)anthracene	0.33	0.33	**0.098**	**0.40**	**0.17**
Indeno[1,2,3-cd]pyrene	0.5	0.5	**0.56**	**1.6**	**1.1**

Notes:
Bold = Compound Detected
J = Estimated Concentration
Indicates compound Exceeds NYSDEC USCO
Indicates compound Exceeds NYSDEC RRSCO

Metals including barium, cadmium, copper, lead, mercury, nickel, and zinc were identified in twenty (20) soil samples from seventeen (17) soil borings at concentrations exceeding their USCO and/or RRSCO across the Site. The depth of metals impacts ranged from depth of 1.5 to 3 ft bgs on the western portion of the Site as identified in borings S-9, S-11, and S-25, to depths ranging from 2.5 ft bgs to 24 ft bgs on the eastern portion of the Site as identified in borings B-12, B-15, B-16, B-18, B-19, B-26, and SB-33. A Summary of soil samples with metals exceeding the USCOs and/or RRSCOs are presented below.

Summary of Metals Exceeding the NYSDEC USCO and RRSCO

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCOs	S-9 (2.5-3)	S-11 (2 -2.5)	S-12 (2-2.5)	S-12 (6.5-7)	S-12 (11-11.5)	S-15 (2-2.5)	S-16 (3-3.5)	S-17 (3-3.5)	S-17 (13.5-14)	S-18 (2-2.5)
Mercury	0.18	0.81	**3.85**	**5**	**0.5**	0.010 U	**0.17**	**0.83**	**0.81**	**0.072**	**0.012 J**	**0.39**
Barium	350	400	**259**	**226**	**72**	**89.5**	**396**	**39.3**	**176**	**85.8**	**72.5**	**81.9**
Cadmium	2.5	4.3	**0.16 J**	**1.3**	**0.64 J**	**7.6**	**22.9**	0.11 U	**0.16 J**	**0.13 U**	0.11 U	0.12 U
Copper	50	270	**38.5**	**143**	**30.2**	**24.9**	**25.8**	**8.4**	**22.8**	**36.2**	**12.2**	**18.4**
Lead	63	400	**701**	**1230**	**79.7**	**6.1**	**801**	**15.3**	**186**	**47.4**	**3**	**107**
Nickel	30	310	**15.7**	**46.6**	**19.8**	**39**	**49.2**	**8.5**	**12.1**	**45.1**	**13.5**	**252**
Zinc	109		**425**	706	**84.2**	**301**	**587**	**34.3**	**91.2**	**53.1**	**159**	**61.5**

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCOs	S-19 (1.5-2)	S-20 (9-9.5)	S-21 (3-3.5)	S-25 (2.5-3)	S-26 (3-3.5)	SB-30 (2-3)	SB-31 (2.5-3)	SB-32 (3-3.5)	SB-33 (23.5-24)	SB-34 (1.5-2)
Mercury	0.18	0.81	**2.5**	**0.014 J**	**0.48**	**0.062**	**0.11**	**0.075**	**0.13 F1**	**0.028**	**0.011 J**	**0.23**
Barium	350	400	**249**	**76.6**	**70.4**	**92.7**	**80.5**	**94.8**	**114**	**46.3**	**90.6**	**90.1**
Cadmium	2.5	4.3	**0.38 J**	0.11 U	0.16 U	0.17 U	**0.16 J**	0.15 U	**0.15 U**	**0.16 U**	**0.73**	**0.16 J**
Copper	50	270	**40.2**	**95.8**	**16.8**	**32**	**15.1**	**16.9**	**27.1**	**11.9**	**227**	**21.3**
Lead	63	400	**819**	**3.8**	**68.9**	**75.9**	**33.6**	**81.8**	**171**	**1900**	**33.6**	**113**
Nickel	30	310	**18.8**	**17.5**	**17.4**	**20.3**	**14.1**	**15.8**	**17.5**	**12.7**	**24.4**	**16.3**
Zinc	109		**412**	**31.6**	**104**	**148**	**288**	**78.1**	**115**	**32**	**286**	**132**

Notes:
Bold = Compound Detected
J = Estimated Concentration
Indicates compound Exceeds NYSDEC USCO
Indicates compound Exceeds NYSDEC RRSCO

The pesticides 4,4'-DDE and 4,4'-DDT were detected in one sample, S-16 (3-3.5) at concentrations exceeding its USCO of 0.0033 mg/kg, but below the RRSCO of 7.9 mg/kg.

Summary of Pesticides Exceeding the NYSDEC USCOs

Analyte	Part 375-6.8(a) UUSCOs	Part 375-6.8(b) RRSCOs	S-16 (3-3.5)
4,4'-DDE	0.0033	8.9	**0.0049 J**
4,4'-DDT	0.0033	7.9	**0.0040 J**

Notes:
Bold = Compound Detected
J = Estimated Concentration
Indicates compound Exceeds NYSDEC USCO

No exceedances of VOCs or PCBs above any of the SCOs were detected in any of the soil samples collected during the RI.

Sampling locations and concentrations of the SCO exceedances are identified in **Figure 2.2**. Analytical data is presented in **Tables 1A through 1F**.

2.2.2 Groundwater Contamination

Six (6) permanent groundwater monitoring wells were installed to investigate groundwater in the area of each REC. Groundwater samples were analyzed for TCL/TAL +30, PFAS, and 1-4 dioxane. The depth of the wells ranged from 25 to 45 ft bgs. The depth of water table was determined to vary from 15 to 18 ft bgs across the Site. All the wells were constructed utilizing 2-inch PVC pipe with a 10-foot, 20 (0.020 inches) slot screen. Five of the wells (MW-1, MW-2, MW-3S, MW-4, and MW-5) were constructed with well screen from 15 ft to 25 ft bgs. One well deeper well (MW-3D) was constructed with well screen from 35 ft to 45 ft bgs.

The monitoring wells were developed until the purge water being pumped was free of sediment, or the well no longer had groundwater present, whichever was encountered first. The development water was collected in drums for disposal off-site. **Appendix B** includes the monitoring well construction logs.

From May 15 to May 17, 2019, the monitoring wells were sampled in accordance with USEPA low flow sampling procedures. The purge water went through a “flow through cell,” where groundwater geochemical parameters including pH, redox potential, specific conductance, dissolved oxygen, salinity and turbidity were measured at three (3) minute intervals. Drawdown during the well sampling was also measured. Groundwater samples were collected once the geochemical parameters stabilized for three consecutive readings. **Appendix C** includes the purge data for the groundwater monitoring wells.

A groundwater contour map was developed using well gauging and surveying data (**Figure 2.3**). The map depicts groundwater flow toward the west across the site, which consistent with the Site topography.

Monitoring well locations and results are included on **Figure 2.4**. Analytical data is presented in **Tables 2A through 2F**. The well gauging and survey data are presented

on **Table 3.1.**

In MW-3S dissolved VOCs including trichloroethene (TCE) (9.8 ug/L) and benzene (1.1 ug/L) were detected at concentrations exceeding their AWQS of 1 ug/L for benzene, and 5 ug/L for TCE. There were no exceedances of the AWQS in MW3D, which was screened in the bedrock. In MW-4, 1,1,2-Trichloroethane (1,1,2-TCA) (1.3 ug/L), methyl-tertiary-butyl-ether (MTBE) (29ug/L), TCE (8.8 ug/L) were detected in the groundwater at concentrations that exceeds their AWQS of 10 ug/L for MTBE, 5 ug/L for TCE, and 1 ug/L for 1,1,2-TCA. In MW-5, methylene chloride (5.4 ug/L) exceeds the AWQS at 5 ug/L.

The SVOC benzo(a)anthracene was detected in monitoring well MW-4 (0.017 ug/L) at a concentration exceeding its AWQS of 0.002 ug/L.

Several metals including aluminum, chromium, iron, magnesium, manganese, selenium, and sodium were also detected at levels that exceeded the TOGs Class GA AWQS or TOGs maximum effluent limitations in at least one of the monitoring wells sampled.

There were no exceedances for pesticides or PCBs detected in any of the groundwater samples collected. The groundwater samples which exceeded the AWQS are summarized below.

Analyte	NYSDEC Groundwater Quality Criteria	MW-3S	MW-4	MW-5
Benzene	1	**1.1**	ND	ND
Trichloroethene	5	**9.8**	**8.8**	0.75 J
MTBE	10	ND	**29**	ND
Methylene Chloride	5	ND	ND	**5.4**
1,1,2-Trichloroethane	1	ND	**1.3**	ND
Benzo(a)anthracene	0.002	0.016 U	**0.17 J**	0.016 U
Selenium	10	6.6 J	**13.7**	ND
Chromium	50	10.6	**102**	4.7

Notes:
Bold = Compound Detected
U = Compounds Not Detected
J = Estimated Concentration
ND = Compound Not Detected
Indicates compound Exceeds NYSDEC Groundwater Quality Criteria

There were no exceedances to the AWQS detected in wells MW-1, MW-2 and MW-

3D.

The following conclusions can be made based on the above groundwater results:

- Dissolved CVOCs exceedances were limited to the shallow groundwater zone in the area between MW-3S, MW-4, and MW-5.
- Dissolved SVOC (benzo(a)anthracene) was identified only in MW-4 and the reported result was flagged “j” in the laboratory reporting.
- One benzene exceedance at 1.1 ug/L, which is just above the AWQS of 1 ug/L, was detected in MW-3S.
- Several metals exceeded their AWQS sporadically across the Site. The majority of the detected metals (sodium, aluminum, magnesium, manganese, and iron) are secondary contaminants and their exceedances may be the result of background levels. Chromium, which is not a secondary metal, was only detected in MW-4 at a concentration of 102 ug/L, which barely exceeds its AWQS of 50 ug/L.

2.2.3 Soil Vapor Contamination

To evaluate the potential for future exposures in any future buildings, SESI designed an SVI plan in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion (Guidance) (October 2006).

On May 8, 2019, SESI installed six soil vapor (SV) sample points (SV-1 through SV-6) across the Site in the footprint of the proposed development. The SV samples were collected a depth of 13 feet bgs which is approximately two to three feet above the groundwater table. **Figure 2.5** presents the SV sampling locations.

Soil vapor points were installed with an adequate surface seal to prevent outdoor air infiltration at each sampling location. Soil vapor points were installed using a direct push Geoprobe®. Porous, inert backfill packer sand was used to create a sampling column of 2 feet in length. The vapor points were fitted with inert Teflon® tubing to the surface. The soil vapor points were sealed above the sampling zone with a bentonite slurry for a minimum distance of 3 feet. The remainder of the borehole was backfilled with clean material.

Prior to sampling, the soil vapor points were purged three times the volume of the sample point and tube. Flow rates for both purging and collecting samples were maintained below 0.2 liters per minute to minimize outdoor air infiltration during sampling. Samples were collected in certified 1-L Summa ® canisters provided by the laboratory. All the samples were sent to Eurofins – Test America (an ELAP-accredited) laboratory for EPA TO-15 analysis.

The soil vapor results are presented in **Figure 2.5** and listed in **Table 4.1**. The results were compared to the applicable the NYSDOH October 2017 Matrices threshold levels.

CVOCs including, carbon tetrachloride and TCE were identified at several locations at concentration exceeding their respective lower threshold values when compared to the applicable NYSDOH 2017 Matrix A. Carbon tetrachloride was detected at concentrations of 41 ug/m^3 (SV-6) and 630 ug/m^3 (SV-5) exceeding its most stringent NYSDOH Matrix A threshold value of 6 ug/m^3. TCE was identified at concentrations of 31 ug/m^3 (SV-2), 13 ug/m^3 (SV-5) 810 ug/m^3 (SV-6), 260 ug/m^3 (SV-7), 20 ug/m^3 (SV-8), 77 ug/m^3 (SV-9), 13 ug/m^3 (SV-13), and 9.2 ug/m^3 (SV-15) exceeding its most stringent NYSDOH Matrix A threshold value of 6 ug/m^3. Cis-1,2 dichloroethene (cis-1,2 DCE) was identified at concentrations of 110 ug/m^3 (SV-7) and 13 ug/m^3 (SV-9) exceeding its most stringent NYSDOH Matrix A threshold value of 6 ug/m^3.

Elevated concentrations of PHC VOCs were detected sitewide. The highest concentrations of benzene was detected near the central eastern portion in vapor points SV-3 (120 ug/m^3) and SV-5 (140 ug/m^3). The highest concentrations of toluene was detected in vapor points SV-11 and SV-15 (130 ug/m^3) and SV-5 (190 ug/m^3). The highest concentrations of total xylenes were detected in vapor points SV-1 (43 ug/m^3), SV-5 (46 ug/m^3), SV-7 (159 ug/m^3), and SV-15 (69 ug/m^3). Ethylbenzene was detected in SV-7 at a concentration of 230 ug/m^3. Finally, 1,3 butadiene was detected sitewide at concentrations ranging from 1.8 ug/m^3 in SV-15 to 250 ug/m^3 in SV-1.

The soil vapor samples which exceeded the NYSDOH 2017 Matrices lower threshold concentrations are summarized below.

Analyte	NYSDOH Matrices Vapor Threshold Concentrations	SV-1	SV-2	SV-3	SV-4	SV-5	SV-6	SV-7
VOCS by TO-15 (ug/m3)								
Ethylbenzene		9 U	19 U	26 U	24 U	10 U	18 U	**230**
1,3-Butadiene		**250**	**110**	**98**	**66**	**190**	**100**	**15**
Toluene		**47**	**37**	**73**	**32**	**190**	**61**	**14**
Chlorobenzene		9 U	20 U	28 U	25 U	11 U	19 U	**3.7 J**
n-Hexane		**310**	**38**	**97**	**23**	**150**	**67**	**25**
Cyclohexane		**23**	15 U	21 U	19 U	**18**	14 U	**5.9 J**
Tetrachloroethene	100	14 U	30 U	41 U	37 U	**95**	28 U	**20**
n-Heptane		**97**	18 U	**39**	22 U	**84**	**21**	**14**
cis-1,2-Dichloroethene	6	8 U	18 U	24 U	21 U	10 U	16 U	**110**
m,p-Xylene		**31**	48 U	66 U	59 U	**36**	45 U	**130**
2,2,4-Trimethylpentane		**14**	21 U	28 U	25 U	11 U	19 U	**8.3 J**
1,3-Dichlorobenzene		12 U	27 U	36 U	33 U	14 U	25 U	**5.3 J B**
Carbon tetrachloride	6	13 U	28 U	38 U	34 U	**630**	**41**	1.5 U
Ethanol		94 U	210 U	280 U	260 U	110 U	190 U	**160**
Isopropyl alcohol		120 U	270 U	370 U	330 U	150 U	250 U	44 U
Acetone		**430**	**5700 E**	**4700 E**	**5300 E**	**2400 E**	**4400 E**	**520**
Chloroform		10 U	22 U	29 U	26 U	**19**	20 U	2.5 U
Benzene		**71**	**20**	**120**	17 U	**140**	**58**	**9.9**
1,1,1-Trichloroethane	100	11 U	24 U	33 U	30 U	13 U	22 U	**6.8 J**
Methylene Chloride	100	17 U	38 U	52 U	47 U	21 U	36 U	**12 J**
Carbon disulfide		16 U	34 U	47 U	42 U	**53**	32 U	**5.8 J**
1,1-Dichloroethane		8 U	18 U	24 U	22 U	10 U	17 U	**3.7 J**
1,1-Dichloroethene	6	8 U	18 U	24 U	21 U	10 U	16 U	**9.3**
tert-Butyl alcohol		150 U	330 U	460 U	410 U	180 U	310 U	45 U
Trichlorofluoromethane		11 U	25 U	34 U	30 U	13 U	23 U	**6.3 J**
Dichlorodifluoromethane		25 U	55 U	75 U	67 U	30 U	51 U	**24 J**
Freon TF		15 U	34 U	46 U	42 U	18 U	31 U	**43**
Methyl Ethyl Ketone		**170**	**100**	**130**	**100**	**130**	**140**	**26**
1,1,2-Trichloroethane		11 U	24 U	33 U	30 U	13 U	22 U	4.3 U
Trichloroethene	6	11 U	**31**	32 U	29 U	**13**	**810**	**260**
Xylene, o-		**12**	19 U	26 U	24 U	**10**	18 U	**29**
1,2,4-Trimethylbenzene		**18**	22 U	30 U	27 U	**15**	20 U	**5.0 J**

Analyte	NYSDOH Matrices Vapor Threshold Concentrations	SV-8	SV-9	SV-10	SV-11	SV-12	SV-13	SV-14	SV-15
VOCS by TO-15 (ug/m3)									
Ethylbenzene		**8.6**	**27**	**4.2 J**	**8.5**	**6.9 J**	**14**	**4.2 J**	**16**
1,3-Butadiene		**9.5**	**110**	**89**	**4.5**	**89**	**120**	**5.7**	**1.8 J**
Toluene		**45**	**21**	**39**	**130**	**41**	**63**	**140**	**130**
Chlorobenzene		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
n-Hexane		**14**	**88**	**55**	**230**	**60**	**160**	**38**	**21**
Cyclohexane		**6.0 J**	**10**	**4.7 J**	**6.4 J**	**6.2 J**	**6.7 J**	2.2 U	2.2 U
Tetrachloroethene	100	**14**	**16**	**8.8 J**	**70**	**16**	**6.9 J**	**4.7 J**	**8.1 J**
n-Heptane		**11**	**39**	**16**	**22**	**28**	**34**	**9.3**	**10**
cis-1,2-Dichloroethene	6	1.5 U	**13**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
m,p-Xylene		**19 J**	**73**	**8.9 J**	**21 J**	**17 J**	**34**	**11 J**	**53**
2,2,4-Trimethylpentane		4.1 U	**7.0 J**	**4.2 J**	**13**	4.1 U	**10**	**10**	**7.8 J**
1,3-Dichlorobenzene		**7.1 J**	**5.5 J**	4.9 U	**9.5 J B**	4.9 U	**5.6 J**	5.1 U	**6.6 J B**
Carbon tetrachloride	6	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.6 U	1.5 U
Ethanol		**160**	**140**	**99**	**230**	**120**	**160**	**250**	**130**
Isopropyl alcohol		44 U	44 U	44 U	44 U	44 U	44 U	46 U	44 U
Acetone		**320**	**220**	**230**	**2000 D**	**290**	**650**	**1200 D**	**720**
Chloroform		2.5 U	**18**	2.5 U	2.5 U	2.5 U	2.5 U	2.6 U	2.5 U
Benzene		**5.0 J**	**42**	**12**	**8.3**	**19**	**13**	**5.2 J**	**4.2 J**
1,1,1-Trichloroethane	100	**39**	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.8 U	3.7 U
Methylene Chloride	100	**6**	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	7.2 U	**7.6 J**
Carbon disulfide		**8.7 J**	**9.3 J**	**11 J**	**240**	**54**	**60**	**52**	**38**
1,1-Dichloroethane		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,1-Dichloroethene	6	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.4 U	1.3 U
tert-Butyl alcohol		45 U	45 U	45 U	**87 J**	45 U	45 U	**62 J**	45 U
Trichlorofluoromethane		**4.8 J**	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.5 U
Dichlorodifluoromethane		9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	10 U	9.9 U
Freon TF		**65**	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.5 U	2.4 U
Methyl Ethyl Ketone		**18**	**35**	**26**	**210**	**39**	**100**	**110**	**95**
1,1,2-Trichloroethane		4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.4 U	4.3 U
Trichloroethene	6	**20**	**77**	1.6 U	**4.4 J**	**2.7 J**	**13**	1.7 U	**9.2 J**
Xylene, o-		**6.4 J**	**19**	**3.7 J**	**6.2 J**	**6.5 J**	**9.5**	**4.0 J**	**16**
1,2,4-Trimethylbenzene		**4.6 J**	**4.3 J**	3.9 U	**5.7 J**	**5.4 J**	3.9 U	**4.7 J**	**4.3 J**

Notes:

Bold = Compound Detected
U = Compounds Not Detected
Indicates compound Exceeds NYSDOH Matrices Lower Threshold Concentration

The following conclusions can be made based on the above soil vapor results:

- Carbon tetrachloride exceeded the NYSDOH values in SV-6 and SV-5, which are located in the eastern portion of the Site. Carbon tetrachloride was not detected in groundwater or soil sample.
- TCE exceedances were detected across the Site. The TCE exceedances are distributed in central portions of the Site as well as the border sampling point along the southern and eastern property limits. TCE concentrations in groundwater exceeded the AWQS, however, the detected concentrations are not levels that form a source for soil vapors. The source of the TCE in soil gas may be low levels of TCE in soils in addition to the low levels of groundwater.

2.2.4 Geophysical Investigation

On May 6, 2019, a geophysical survey was completed by American Geophysics, Inc. of Butler, NJ. The scope of work was to perform a geophysical survey to clear boring locations, identify and mark all detected USTs, associated piping and any areas of concern (AOCs).

Two metallic anomalies consistent with USTs were identified and marked in pink paint. One area of prior excavation was detected and marked on site with pink paint. No utilities inside the property lines were detected.

2.3 GEOLOGICAL CONDITIONS

The subsurface conditions consist of brown to gray fine to coarse sand, mixed with traces of silt and gravel to depths ranging from 15 to 45 ft-bgs. Fractured rock was encountered on the eastern side of the Site at approximately 21 ft-bgs.

Groundwater was encountered at depths of approximately 15 ft to 18 ft bgs in soil borings performed by SESI. The groundwater flow direction was determined to be in a westerly direction across the Site.

2.4 CONCEPTUAL SITE MODEL

The overall depth of impacted soils exceeding the USCOs ranged from 2 feet to 24 ft-bgs. Refusal was beneath 24 ft-bgs and therefore, no soil sampling was conducted beyond 24 ft-bgs. PAH impacts exceeding both the USCO and the RRSCOs were identified in shallow soils two to three ft-bgs. Metals contaminated soils exceeding the

RRSCOs were identified in shallow soils at 11.5 ft-bgs. Metals contaminated soils exceeding the USCO extends down to 24 ft-bgs in certain areas where refusal on bedrock was encountered. Pesticides impacted soils were identified in shallow soils in one area near the eastern portion of the Site.

The applicable standards criteria and guidance (SCGs) for the Site groundwater are the AWQS. The Site's groundwater has been impacted with low levels of VOCs, PAHs and metals above the AWQS near the central portion of the Site as a result of the historical land uses.

The site groundwater flow direction is to the west. The groundwater table is at 15-18 ft-bgs. The range in groundwater depth is a result of the time of the year and the method (e.g. boring or permanent well) with which the groundwater depth was reported.

The pathway of the contaminated groundwater to human receptors is limited to the ingestion of the groundwater or direct exposure through excavation work. However, groundwater in this area of New Rochelle is not used for drinking. In addition, the impacted Site groundwater is not likely to have an ecological pathway since the nearest surface water receptor is 0.5 miles east of the Site.

Finally, the PHC VOCs and CVOCs detected in soil vapor can result in soil vapor intrusion into the future on-Site buildings.

2.5 IDENTIFICATION OF STANDARDS, CRITERIA AND GUIDANCE

The following standards and criteria typically will apply to Site Characterizations, Remedial Investigations, remedy selection, UST closures, remedial actions and Site management activities:

- DER-10 / Technical Guidance for Site Investigation and Remediation
- DER-13 / Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York New York State Department of Environmental Conservation
- 6 NYCRR Part 257 - Air Quality Standards
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations

- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (October 1994)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006)
- DER Interim Strategy for Groundwater Remediation at Contaminated Sites in New York State
- 6 NYCRR Part 375 - Regulations Subparts 1, 3 and 6 applicable to the Brownfield Cleanup Program
- Citizen Participation in New York's Hazardous Waste Site Remediation Program: A Guidebook (June 1998)
- USEPA Office of Solid Waste and Emergency Response Directive 9355.047FS Presumptive Remedies: Policy and Procedures (September 1993)
- USEPA Office of Solid Waste and Emergency Response Directive 9355.048FS Presumptive Remedies
- Site Characterization and Technology Selection for CERCLA sites with Volatile Organic Compounds in Soils (September 1993)
- 6 NYCRR Part 612 - Registration of Petroleum Storage Facilities (February 1992)
- 6 NYCRR Part 613 - Handling and Storage of Petroleum (February 1992)
- 6 NYCRR Part 614 - Standards for New and Substantially Modified Petroleum Storage Tanks (February 1992)
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil (November 1998)
- 6 NYCRR 375 Table 375-6.8(a) and Table 375-6.8(b)
- 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- 40 CFR Part 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- STARS #1 - Petroleum-Contaminated Soil Guidance Policy

- STARS #2 - Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects
- SPOTS #14 - Site Assessments at Bulk Storage Facilities (August 1994)
- Spill Response Guidance Manual
- Permanent Closure of Petroleum Storage Tanks (July 1988)
- NYSDOH Environmental Health Manual CSFP-530 - “Individual Water Supplies - Activated Carbon Treatment Systems”
- 40 CFR Part 144 - Underground Injection Control Program
- 10 NYCRR Part 67 – Lead
- 12 NYCRR Part 56 - Industrial Code Rule 56 (Asbestos)
- 6 NYCRR Part 175 - Special Licenses and Permits--Definitions and Uniform Procedures
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (November 1998)
- 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (November 1998)
- 6 NYCRR Subpart 374-3 - Standards for Universal Waste (November 1998)
- 6 NYCRR Part 608 - Use and Protection of Waters
- TAGM 4013 - Emergency Hazardous Waste Drum Removal/ Surficial Cleanup Procedures (March 1996)
- TAGM 4059 - Making Changes to Selected Remedies (May 1998)
- Groundwater Effluent Limitations
- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works
- TOGS 2.1.2 - Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites
- OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (November 1997)

- Groundwater Monitoring Well Decommissioning Procedures (May 1995)
- The activity is a component of a program selected by a process complying with the public participation requirements of section 1.10, to the extent applicable.

2.6 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.6.1 Qualitative Human Health Exposure Assessment

There are potential exposure pathways related to the contamination if left unaddressed.

PAHs and metal exceedances of the RRSCOs in the Site soil that consist of contaminated fill pose a risk to human health. The exposure pathway to humans can be through direct dermal contact with the contaminated soils or incidental ingestion.

The pathway of the contaminated groundwater to human receptors is limited to the direct ingestion of the groundwater or direct exposure through excavation work. However, groundwater in this area in New Rochelle is not used for drinking water. The groundwater will naturally attenuate with time and is not anticipated to be a pathway for human heath exposure.

The CVOC levels in the Site soil vapors were found to exceed the NYSDOH Matrices lower threshold concentrations. The exposure route for soil vapor is through the inhalation of the contaminated soil vapor that may intrude into the enclosed spaces of any planned Site development.

2.6.2 Fish and Wildlife Impact Analysis

The Site does not contain any wildlife or fish ecologically sensitive resources and hence the Site contamination is not expected to have any impacts on any fish or wildlife ecological resources. The closest surface water body, a tributary to Echo Bay, is located approximately 0.5 miles east of the Site.

It is unlikely the contaminated groundwater from the Site will reach the surface water of the Echo Bay. The detected groundwater contaminant levels is expected to decrease as a result of natural attenuation. Per DER-10 Appendix 3C, no fish and wildlife impact

analysis are needed.

2.7 REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.7.1 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

2.7.2 Soil

RAOs for Public Health Protection

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

2.7.3 RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.7.4 Soil Vapor RAOs

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from potential present and future soil vapor intrusion into buildings at the site.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The objective of the remedy, as needed for a residential development with affordable units, is to achieve a cleanup that is the most protective of the human health and the environment and that does not rely on Engineering or Institutional Controls (ECs or ICs). This objective will most likely be accomplished under a Track 1 by achieving the USCOs.

Track 1

A remedy pursuant to this track must achieve compliance with the USCOs set forth in 6 NYCRR Table 375-6.8(a).

In a conditional Track 1 remedy institutional and engineering controls are allowed only for periods of less than five years except in the limited instance where a volunteer has conducted remedial activities resulting in a bulk reduction in groundwater contamination to asymptotic levels. This alternative would involve the complete removal and/or remediation of the soil with exceedances to the USCO, which were encountered at up to 24 ft-bgs across the Site. A feasible remedial technology that may be used to implement this alternative involves the excavation of the contaminated soil and transportation to an approved off-site facility for disposal.

Institutional and engineering controls may be implemented to address contamination in groundwater and soil vapor. Monitored natural attenuation (MNA) that consists of periodic monitoring of the contaminant levels in the Site groundwater monitoring wells will constitute an engineering and institutional control until the groundwater levels are below the standards or until they reach asymptotic levels that are accepted by the NYSDEC. Given the low levels of groundwater exceedances, it is expected that the groundwater will meet the AWQS in less than five years after the implementation of excavation, which will result in the removal of contamination sources.

A passive sub-slab depressurization system (SSDS) will be installed as a temporary (up to 5 years) engineering control for the mitigation of any risks resulting from the detected soil vapors on the Site. The design for the proposed buildings has not been completed as of the time of writing this RAWP. Once the building design is completed a

SSDS will developed for each proposed building and will be submitted for NYSDEC and NYSDOH approvals. The passive system will be designed with the ability to be turned active, if needed. The vapor intrusion risk will continue to be monitored up to five years. The VI monitoring will include the collection of samples from the sub-slab of the proposed buildings and the indoor air in accordance with the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006) and the May 2017: Updates to Soil Vapor / Indoor Air Decision Matrices. If within the 5 years the soil vapor levels have dropped to below the "no further action" sub-slab vapor concentrations, then the SSDS will not be considered an EC anymore and the condition on the Track 1 remedy will be removed. The monitoring will be described in a Site Management Plan (SMP). The SSDS design will be provided for approval once the proposed building plans are completed. If soil vapors continue to exceed the matrix values that require mitigation or monitoring, then the SSDS will become a permanent EC and the remedy will be considered a Track 2 as described below.

Track 2

Track 2 consists of restricted use with generic soil cleanup objectives. This track requires the Volunteer implement a cleanup that achieves an SCO, which is, based on the planned Site sue, the lowest of restricted-residential or protection of groundwater water from tables in 6 NYCRR 375-6.7(b) that is consistent with the intended Site use for the top 15 feet of soil (or bedrock if less than 15 feet). Under a track 2 remedy, the remedial program may include the use of long-term institutional or engineering controls to address contamination related to other media including, but not limited to groundwater and soil vapor. The Site remediation pursuant to Track 2 would involve excavation and disposal of the contaminated soils to 24 feet to meet the USCOs.

Institutional and engineering controls would limit Site use and on-Site groundwater. The groundwater remediation would be MNA under this track and it is expected to be finite for the PHC VOCs that resulted from the Site USTs discharge and CVOCs that resulted from manufacturing operations on the Site.

If the soil vapor levels do not reach the “no action” level as described in the matrices (May 2017), then the SSDS as described above will continue to act as an EC and the remedy will be Track 2.

A Track 2 cleanup at a restricted residential use site requires a Site Management Plan (SMP) to ensure that any institutional and engineering controls are maintained and material removed from the Site (post remedial action) is managed properly.

Track 3

The Track 3 cleanup is not applicable to this site because the contaminants on this Site are common and all listed in the SCOs in NYCRR 375-6.8(b) tables.

Track 4

A Track 4 remedy for a restricted residential use does not need to meet specific soil cleanup objectives but requires source removal and typically a Site-wide cover system where, as here, there is Site-wide surficial contamination. The Track 4 cleanup does not have specific soil cleanup objectives, but rather the Applicant may solely or in combination use the SCOs in subpart 375-6, develop or modify site specific SCOs in section 375-6.9, or propose site specific SCOs which are protective of public health and the environment.

Short and long-term institutional and engineering controls are allowed to achieve protection of public health and the environment. In the event a remedy under Track 4 were to be implemented for this Site, it must provide a cover system over exposed residual soil contamination.

Track 4 soil covers for restricted residential use sites require that the top two feet of all exposed surface soils, which exceed the site background values for contaminants of concern and are not otherwise covered by the components of the development of the site (e.g. buildings, pavement), shall not exceed the applicable contaminant-specific soil cleanup objectives per 6 NYCRR Part375-3.8(e)(4)(iii)(a)(1). Track 4 also includes an SMP as an institutional control to ensure that any institutional and engineering controls are maintained, and material removed from the site (post remedial action) is managed properly. The SMP will include periodic (annual) monitoring and reporting of the cover system to ensure continued protection of the human health and the environment.

No Action Alternative

The no action alternative would leave existing sources of contamination in soil and groundwater and soil vapor. The no action alternative is thus unacceptable and has not been compared to the factors below.

Protection of human health and the environment:

Although all tracks will provide adequate protection of human health and the environment, Track 1 would be more protective than the other cleanup tracks because it would remove all soil contamination, which also act as on-Site sources of groundwater contamination. This conditional Track 1 remedy requires a short term ongoing institutional or engineering controls to manage the vapor contamination to effective protect human health and the environment. A Track 1 remedy also initially costs more and is less implementable than Track 2 and 4 remedies. However, if Track 1 can be implemented through the complete removal of all the contaminated soil, then groundwater should be able to naturally attenuate more rapidly than from the other remedies. Moreover, because a Track 1 remedy requires no long term institutional or engineering controls, it is potentially less costly and more implementable in the long run than remedies that rely on such controls for long-term effectiveness. A Track 4 remedy would also be protective of human health and the environment if the proper long-term engineering and institutional controls are put in place and managed in an SMP. However, groundwater may remain contaminated for a longer time.

Compliance with standards, criteria, and guidelines (SCGs):

All cleanup tracks will achieve applicable cleanup standards. However, a Track 1 cleanup achieves a more stringent set of standards than a Track 2 or 4 cleanup.

Short-term effectiveness and impacts:

Generally, Track 1 provides the best short term effectiveness because it promptly removes the most contaminant mass from the Site. Track 2 also accomplishes this, but to a lesser extent. Track 4 is less effective in this regard. Tracks 1 and 2 are somewhat less favorable in terms of short-term impacts primarily because mass removal of the contaminated soils generates more truck trips than a Track 4 limited removal remedy. A Track 4 approach also reduces the risk of construction worker exposure by reducing the

volume of contaminated soil being managed, and has less potential to cause dust and traffic issues. Excavation may result in a greater potential for migration of impacts from the open excavation (e.g. wind erosion, storm water intrusion, etc.), however, an air monitoring program and erosion and sediment controls will be implemented to minimize and control any migration.

Long-term effectiveness and Performance:

Because Tracks 1 & 2 would involve removal of the greatest amount of contaminated soil, they will provide the most long-term effectiveness. As already discussed above a Track 1 cleanup will allow the Site to be used for any purpose without restriction and without reliance on the long-term employment of ICs or ECs (which can fail and require on-going monitoring and maintenance to remain effective over the long-term). A restricted residential Track 2 clean-up allows the Site to be used for almost all possible uses in an urban setting but has the same requirements for long-term ECs and ICs.

The long-term effectiveness of the Track 4 clean-up will be ensured with adherence to the SMP and recording of an Environmental Easement. Although contaminants are left in the on Site, a properly maintained cover system is effective at eliminating the risk of dermal exposure.

Reduction of toxicity, mobility, or volume of contaminated material:

Tracks 1 through 4 will reduce of toxicity and mobility. A Track 1 or 2 would result in more reduction in the volume of contaminated soils than in a Track 4 clean-up. While Track 4 provides a relatively smaller reduction in volume than the other tracks, it relies primarily on the decrease of contaminant mobility.

Constructability:

Tracks 1, 2 and 4 are all implementable given the location and the planned use for the Site.

While there are short term potential impacts from a Track 1 or 2 remedy, the Site is located in the middle of an urban area, and, therefore disposal of the contaminated soils and truck access will not be a problem. Moreover, these short-term impacts will be avoided through implementation of the CAMP and HASP, which will employ truck washing

and odor and dust control measures. Therefore, Track 1 or 2 are implementable remedies for this Site.

Cost effectiveness:

The preferred alternative should provide optimal suitability of the eight accompanying evaluation factors with minimal remedial cost. The contaminated soil/fill layer extends from the surface to a depth of 14± ft bgs. Removal of the soil exceeding the USCO to achieve Track 1 or 2 Site wide will be costly. However, this mass removal results in long term savings by eliminating (or, in Track 2, significantly reducing) the need for indefinite cap monitoring and maintenance. Therefore, a Track 1 or 2 remedy for the Site is cost effective.

The MNA for Groundwater would be the most cost effective compared to active remediation of groundwater for all the remedies. This is especially so in Track 1 or 2 if the mass of contaminants that could be a source of groundwater contamination is removed from the Site.

Community Acceptance:

A community outreach program will be incorporated into all remedial alternatives, per NYSDEC Brownfield Program law and regulations. The Site development will include affordable housing and is part of an area wide redevelopment that includes a mix of modern residences and retail stores.

Land use:

All cleanup tracks would achieve remediation for the planned residential use of the Site, which is consistent with New Rochelle's proposed plans for the area. Developing the property will create short term construction impacts, but the creation of a new affordable housing project will provide significant community benefits.

Zoning: All of the proposed remedies under each track will facilitate the Site to be utilized for a proposed mixed commercial-residential development, which is consistent with applicable zoning laws and anticipated future use of the site.

Applicable comprehensive community master plans or land use plans: Implementation of all Tracks (with institutional controls) cleanup will facilitate the proposed

commercial-residential development, which is consistent with current local land use plan.

Surrounding property uses: Any cleanup approach is not expected to significantly impact land use of the surrounding properties as the truck traffic and access will be on public roads. There will be short term impacts from the remediation and construction project but these will result in long-term benefits of converting defunct, abandoned and contaminated property into new affordable housing and commercial uses.

Citizen Participation: Citizen Participation during implementation of a remedial program will proceed in accordance with the Citizen Participation Plan included as **Appendix H** of this RAWP and as noted above will have minimal community impact. Any short term impacts will be addressed by the CAMP and HASP.

Environmental justice concerns: There are no known environmental justice concerns associated with this project.

Land use designations: A Track 1 remedy will not restrict any current or future land use designations. A restricted residential Track 2 will have very minimal restrictions on the future land use of the property. A Track 2 will have restrictions that will be managed in the SMP.

Population growth patterns: Any of the proposed remedies will not impact reasonably anticipated population growth patterns in the area other than to better accommodate growth by providing for new affordable housing.

Accessibility to existing infrastructure: Existing infrastructure is present in the surrounding area but the on-site infrastructure had to be demolished and removed as part of the building demolitions and more infrastructure will be removed during the remedy. However, new infrastructure will be installed as part of remediation/redevelopment.

Proximity to natural resources: The closest surface water body, a tributary of Echo Bay, is located approximately 0.5 miles east of the Site. Storm water drainage

patterns are generally consistent with the surrounding topography and primarily flow to the east towards Echo Bay.

Off-Site groundwater impacts: Off-Site groundwater impacts were not identified during the RI activities. Measures to prevent any off-site groundwater impacts are proposed in this work plan.

Geography and geology of the Site: See Section 2.3 above.

Current Institutional Controls: There are no current institutional controls associated with the Site. An institutional control may be required to address the long-term management of soil and possibly impacted groundwater remaining at the Site following remediation.

3.2 SELECTION OF THE PREFERRED REMEDY

The remedial alternatives analysis determined that a Track 1 (if achievable) or 2 remedy will be the goal for the Site.

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

A summary of the selected Track 1 or 2 remedial actions to address the impacts identified are discussed below:

1. Installation of sheeting and shoring along the side walls of the entire Site for structure stability of the excavation pit and to prevent impact to off-site structures. A sheet pile wall system will be installed to support the excavation of the on-site contaminated soil and contaminated historic fill.

2. Excavation to achieve a Conditional Track 1 cleanup by removing the remaining contaminated soil/fill source to USCOs if possible or to a Track 2 cleanup if Track 1 cannot be achieved. If no more contaminated soil and fill are left after the planned excavation, which is documented by endpoint confirmatory sampling, then the remedy would achieve the conditional Track 1 for soils on the Site. If contaminated soil and/or fill is left un-excavated, which is documented by endpoint confirmatory sampling, the Volunteer will try to

achieve the Track 2 restricted residential SCOs based on the contaminant levels in the remaining fill down to fifteen feet.

3. Removal of the abandoned in place USTs will be conducted under the RAWP. The UST removal will be conducted as described in the approved RIWP/IRM (Section 3.0).

4. The groundwater will be monitored for contaminants of concern and MNA parameters (DO, ORP, pH and CO2) to determine the change of contaminants with time. The detected VOCs in the Site monitoring wells are expected to meet the groundwater AWQS by MNA alone because the contaminated fill material, which acts as the source, will be removed by excavation and exceedances are low level. The duration of the groundwater remedy will be determined with further monitoring. If the groundwater monitoring post excavation does not result in decreasing groundwater levels to below the AWQS concentrations or to asymptotic levels that are accepted by the NYSDEC, an active groundwater treatment will be proposed and designed based on the available monitoring data.

5. The installation of a sub slab depressurization system (SSDS) as a vapor mitigation measure in the building foundation.

6. Monitoring of soil vapors and indoor air in the enclosed areas of the proposed building up to 5 years to determine of the levels drop to below the “No Action” soil vapor concentrations. If the levels drop that the SSDS will be terminated as an EC.

7. Recording of an Environmental Easement for the entire Site if only track 2 can be accomplished;

8. Preparation of a Site Management Plan, if needed for a track 2 clean-up, for long term management of residual contamination as required by the Environmental Easement, particularly as they pertain to future phases of construction, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) soil excavation and (4) reporting;

9. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;

10. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of the Track-specific SCOs;

11. Documentation of all appropriate off-site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;

12. Import of backfill materials and reuse of soil excavated during redevelopment construction activities, to be used for backfill and cover must be in compliance with: (1) chemical limits and other specifications included in NYCRR 375-6.8 (b) and DER-10 (2) all Federal, State, local rules and regulations and site-specific approvals for handling/reuse and transport of material;

13. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations and overseen and certified by the SESI Remedial Engineer of Record described below.

3.4 UST CLOSURE

The UST IRM as detailed in the RIWP/IRMWP consists of completing a closure effort by removing the two existing abandoned USTs. The location of the two USTs was identified during the geophysical investigation. The two USTs will be removed as part of the remedial action phase at the Site.

As detailed in the RIWP/IRMWP, the two (2) abandoned 3,000-gallon gasoline USTs will be registered with the Westchester County Department of Health (WCDOH), following the submittal of a Petroleum Bulk Storage Application once their exact size and location is known. In addition, the contractor who is removing the tanks, will obtain a work permit from the WCDOH. Following completion of the registration the USTs will be removed as part of the remedial action for the Site.

The UST closure will consist of removing the two existing USTs. A third possible UST may have been located in the prior excavation identified during the geophysical

investigation. If a third UST is encountered, it will be removed along with the other two USTs. All UST work will be conducted by a subcontractor licensed by the City of New Rochelle. These USTs may have been the source of the lead detected in soil and the benzene and MTBE detected in groundwater. In addition, soil vapor contamination includes the petroleum related compounds benzene, toluene and xylenes.

The NYSDEC Division of Environmental Remediation (DER) BCP Project Manager and the WCDOH will be provided a ten (10)-day notice prior to the start of UST removal activities. The petroleum bulk storage (PBS) modification form will be filed and provided as required by 6 NYCRR 612.2(d) subsequent to this UST closure work.

If any liquids have accumulated in the tanks, they will be pumped and disposed of accordingly. The disposal of the liquids will be manifested. The tanks will be cleaned for appropriate scrap metal disposal.

During the UST and piping removal effort, the following field observations will be made and documented:

- A description and photographic documentation of tank and pipeline conditions (e.g., pitting, holes or leak points)
- The excavation floor and sidewalls will be:
- examined for any physical evidence of soil or groundwater contamination;
- field screened with a calibrated PID at transects spaced no more than five (5) feet apart, so that sampling may be biased to the suspected location of greatest contamination.

Immediately after tank removal, if there is no evidence of a discharge in the existing UST excavations, confirmatory soil samples will be collected to demonstrate that the remaining soils meet the SCOs. If no groundwater is present in the excavation, discrete center line soil samples from the bottom of the excavation will be collected at a frequency equal to the total length of the tank in feet divided by five (5) (minimum of one (1) sample) and one (1) sample will be added for the fraction thereof.

Groundwater is deep and not expected to be encountered in the excavation. However, if groundwater is present in the excavation, because the USTs are anticipated

to have contained gasoline, which has a density that is less than water, soil samples will be collected as follows:

- One sample biased based upon field screening results will be taken near or just above the water table from each excavation sidewall for every 30 linear feet of sidewall (minimum of one (1) sample per sidewall).
- Where seasonal fluctuations in the water table elevation can submerge and smear product over a range of several feet, additional samples will be collected in the smear zone.

If there is evidence of a discharge, excavation will continue until all contaminated soils are removed. All grossly contaminated soils as determined by field screening will be removed. Then excavation will continue until all post-excavation confirmatory samples meet the unrestricted SCOs, or until further excavation is no longer feasible.

Confirmatory post excavation soil samples will be collected to demonstrate that all the contamination has been removed as follows:

- One (1) sidewall sample will be collected for each 30 linear feet of excavation, minimum four (4) samples one on each sidewall and one (1) bottom sample for every 900 square feet of excavation area minimum one sample. Based upon field screening, the samples will be biased toward the suspected location of greatest contamination.

The UST confirmatory soil samples will be sent to an ELAP-certified laboratory for TCL/TAL+30, PFAS and 1,4-dioxane analysis. If analytical results of soil sampling identify impacts exceeding the unrestricted SCOs, additional excavation/removals will be conducted to the NYSDEC satisfaction in hotspot areas, and additional confirmatory soil samples will be collected.

Any contaminated groundwater will be addressed as part of the groundwater investigation and remediation. However, if groundwater is encountered in the excavation, it will be observed for sheen or light non-aqueous phase liquid (LNAPL) and a sample may be collected from the excavation. If any LNAPL is observed, it will be excavated/removed to the NYSDEC's satisfaction.

All excavated soils will be characterized for proper disposal. The characterization samples will be collected in accordance with the disposal facility requirement.

Any groundwater or LNAPL that requires removal from the excavation will be either pumped in a Frac Tank or removed with a Vacuum Truck depending on the quantity and properly disposed of off-site.

SESI will include a tank closure report in the FER that documents the procedures for removal of the USTs in accordance with WCDOH regulations including the following:

- A discussion which details the removal of any residual liquids, purging of vapors, tank inerting, tank and piping removal procedures, tank cleaning and tank disposal;
- A discussion of end point sampling and analysis and results;
- A discussion of soil removed and disposed from the Site;
- A discussion of the excavation water handling and treatment, if applicable;
- A report section that details Westchester County's acceptance of the UST closures.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP. All deviations from the RAWP will be promptly reported to NYSDEC for approval and fully explained in the FER.

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

4.1.1 Site Specific Health & Safety Plan (HASP)

A copy of the SESI HASP is included as **Appendix D**. All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

4.1.2 Quality Assurance Project Plan (QAPP)

A copy of SESI QAPP is included as **Appendix E**. All field sampling procedures and analytical methods will be implemented in accordance with this QAPP.

4.1.3 Soil/Materials Management Plan (SoMP)

The SoMP is included as Section 5.4 and includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport and disposal. It also includes all of the controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

4.1.4 Storm-Water Pollution Prevention Plan (SWPPP)

A SWPPP will be prepared prior to start of remediation or construction work. The SWPPP will address requirements of the New York State Storm-Water Management Regulations including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils, via wind or water.

The erosion and sediment controls included in the SWPPP will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control and will be thoroughly analyzed during the SEQRA EIS process.

4.1.5 Community Air Monitoring Plan (CAMP)

A copy of the CAMP for the site is included as **Appendix F**.

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 Project Organization

The Mark 95 LLC and The Mark 95 II LLC, SDC Garden Street Member LLC, and MJ Garden LLC are the BCP Volunteer and redeveloper of the Site. SESI is the environmental consultant for The Mark 95 LLC and The Mark 95 II LLC, SDC Garden Street Member LLC, and MJ Garden LLC. A table summarizing the various personnel associated with the project is included as **Table 4.2** below.

Table 4.2 – Project Personnel

Name	Company	Project Position	Address	Phone Number
Mark Fonte	The Mark 95 LLC & The Mark 95 II LLC, SDC Garden Street Member LLC, and MJ Garden LLC	Volunteer Contact	1955 Central Park Avenue, Yonkers, NY 10710	(914) 490-3366
Fuad Dahan, PE	SESI Consulting Engineers, P.C.	Environmental Consultant's Project Manager	12A Maple Avenue Pine Brook, NJ 07058	(973) 808-9050
Fuad Dahan, PE	SESI Consulting Engineers, P.C.	Remedial Engineer	12A Maple Avenue Pine Brook, NJ 07058	(973) 808-9050
Michael Kilmer	NYSDEC	Project Manager	21 S Putt Corners Rd New Paltz, NY 12561	(845) 633-5463

4.2.2 Remedial Engineer

The Remedial Engineer for this project will be Fuad Dahan, PE. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The

Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the Cottage-Garden Auto Repair Site (Site No. C360180). The Remedial Engineer will certify the FER that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

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

The Remedial Engineer will provide the certifications listed in the FER.

4.2.3 Remedial Action Schedule

A remedial action schedule is included as **Table 4.3** below. The schedule includes estimates of time required to complete the activities associated with the remedial action. It is based on elapsed time from receipt of NYSDEC approval. Once NYSDEC approves this RAWP, an updated schedule showing actual dates will be provided to the NYSDEC as an addendum to this plan.

TABLE 4.3
Remedial Action Schedule

Remedial Activity	Scheduled Date
Draft Remedial Action Work Plan (RAWP) and Fact Sheet, Submit to NYSDEC	June 2019
Address NYSDEC Comments to RAWP and Resubmit	July 2019
45-day Public Comment Period for RAWP is Initiated	July 2019
Public Comment Period for RAWP Ends	End of August 2019
NYSDEC Approves RAWP and Issues Decision Document	September 2019
Complete Remedial Action	September 2019 – February 2020
Draft Final Engineering Report (FER), Submit FER to NYSDEC and SMP (if needed)	March 2020
Certificate of Completion is Issued	April 2020

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the City of New Rochelle Department of Buildings construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Applicant of any variances issued by the Department of Buildings.

4.2.5 Site Security

The Site will be secured with fences and locked gates.

4.2.6 NYSDEC BCP Signage

A project sign will be erected at the main entrance to the Site if required by NYSDEC to indicate that the project is being performed under the New York State Brownfield Cleanup Program.

4.2.7 Pre-Construction Meeting with NYSDEC

A pre-construction meeting will be held with NYSDEC prior to the start of major remedial construction activities.

4.2.8 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included in **Table 4.4** below. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

TABLE 4.4 - EMERGENCY AND CONTACT NUMBERS

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3-day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
Fuad Dahan – Remedial Engineer (SESI Consulting Engineers)	(973) 808-9050

Director of Construction	TBD

* Note: Contact numbers subject to change and will be updated as necessary

TBD – To Be Determined

4.3 SITE PREPARATION

4.3.1 Mobilization

Mobilization tasks will include:

- Construction of temporary facilities and utilities;
- Set-up of construction equipment and facilities;
- Construction of fencing and barriers;
- Construction of erosion control measures; and
- Construction of decontamination and materials staging areas.

4.3.2 Erosion and Sedimentation Controls

Erosion and sediment control measures are outlined in the SWPPP (see Section 4.1.4).

4.3.3 Utility Marker and Easements Layout

The Volunteer and its contractors will be solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors will obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

4.3.4 Sheeting and Shoring

Sheet pile walls will be installed to support the excavation of the contaminated fill.

The Volunteer and its contractors will be solely responsible for safe execution of all invasive and other work performed under this Plan and the implementation of safety measures (Sheeting and Shoring) as necessary to maintain safe working environment. The Volunteer and its contractors will obtain any local, State or Federal permits or approvals that may be required to perform work under this Plan. Further, the Volunteer and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved Plan.

4.3.5 Dewatering

Dewatering is not anticipated to be required as part of this remedy because groundwater was identified at 15 ft-bgs. If groundwater is encountered, it will be treated as contaminated groundwater. The groundwater will be pumped for temporary storage frac-tanks, which will be disposed of at an off-site facility. The disposal of the groundwater will follow the requirements of disposal facility for sampling and characterization.

4.3.6 Equipment and Material Staging

Equipment and material staging areas are expected to be relocated throughout the Site during remedial construction.

4.3.7 Decontamination Area

The decontamination area construction and operational requirements are provided in the HASP. Truck tires must be washed before exiting the Site.

4.3.8 Site Fencing

A construction safety fence is installed around the entire perimeter of the site. Access through gates will be provided at various points as required by the Volunteer and its contractors. These gates will be locked during non-construction hours.

4.3.9 Demobilization

Demobilization will include the following:

- Restoration of areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management area[s], and access area);
- Removal of temporary access areas (whether on-Site or off-Site) and restoration of disturbed access areas to pre-remediation conditions;
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations;
- Equipment decontamination; and
- General refuse disposal.

4.4 REPORTING

4.4.1 Weekly Reports

Weekly reports will be submitted to NYSDEC and NYSDOH Project Managers on Monday following the end of the week of the reporting period and will include:

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

4.4.2 Other Reporting

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of

acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before, during and after remediation. Photos will be submitted to NYSDEC on CD or other acceptable electronic media and will be sent to NYSDEC's Project Manager (2 copies) and to NYSDOH's Project Manager (1 copy). CD's will have a label and a general file inventory structure that separates photos into directories and sub-directories according to logical Remedial Action components. A photo log keyed to photo file ID numbers will be prepared to provide explanation for all representative photos.

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on-site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.3 Complaint Management Plan

A public information board will be constructed at the perimeter of the Site. This information board will contain the phone number of the Volunteer where complaints may be directed. General information notices to the public will also be posted on this board for their benefit.

4.4.4 Deviations from the Remedial Action Work Plan

If there are any deviations from the RAWP, the following steps will be taken:

- Reasons for deviating from the approved RAWP will be identified and communicated directly to the NYSDEC Project Manager;
- All deviations will be communicated verbally and in writing (by letter or email) to the NYSDEC Project Manager;
- The deviations will be implemented based on verbal or written approval of the NYSDEC Project Manager. All verbal approvals will be followed-up in writing.
- The effect of the deviations on the overall remedy will be described/addressed in the FER.

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

Removal of all contaminated soils under the Remedial Action for the Site will be implemented in accordance with the site-specific QAPP (**Appendix E**).

A plan depicting the locations where the excavation activities will be carried out are included as **Figures 5.1**.

5.1 SOIL CLEANUP OBJECTIVES

The Soil Cleanup Objectives for this Site are the unrestricted SCOs as listed in **Appendix G**.

Soil and materials management on-site will be conducted in accordance with the Soil Management Plan as described below (Section 5.4).

5.2 REMEDIAL PERFORMANCE EVALUATION

5.2.1 End-Point Sampling Frequency

For all excavations, post-excavation soil and groundwater samples will be collected in accordance with Section 5.4 of DER-10.

5.2.2 Methodology

Soil samples will be collected in accordance with the QAPP using disposable gloves/trowels or dedicated, decontaminated stainless steel spoons.

5.2.3 Reporting of Results

The samples will be submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) certified laboratory. The results will be reported in accordance with NYSDEC requirements for Category B data deliverables (as outlined in DER-10).

5.2.4 QA/QC

Collection of QA/QC samples to evaluate potential cross-contamination from sampling equipment and during shipment of samples and repeatability of laboratory analytical practices will be in accordance with the QAPP included as **Appendix E**. Field blanks, trip blanks and duplicate samples associated with daily sampling activities will be collected as a part of the QA/QC practices.

5.2.5 DUSR

To ensure that the field sampling and laboratory analytical practices are acceptable, the data associated with all the samples will be validated by a third party (in accordance with requirements of DER-10). The validation approach and results will be presented in a DUSR to be included in the FER.

5.2.6 Reporting of End-Point Data in FER

The FER will include a table of end point data with highlights or a summary of exceedances of SCOs. A spider map showing all SCO exceedances will also be presented in the FER.

Chemical labs used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

End point sampling, including bottom and side-wall sampling, will be performed in accordance with DER-10 sample frequency requirements. Side-wall samples will be collected a minimum of every 30 linear feet. Bottom samples will be collected at a rate of one for every 900 square feet. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

Source removal excavation activities will be implemented during the course of the redevelopment activities within the proposed building footprints and parking areas. Based on the RI, the depth of contaminated fill at the Site ranges to depths from 1.5 - 14 ft bgs. The entire Site will be excavated to the depth of approximately 15 ft bgs in addition spot excavation will be conducted to remove all soil exceedances of the USCO. No backfilling

is expected to be needed. Following the completion of the remedial excavation, end-point remedial performance sampling will be completed to ensure the Site meets USCOs or RRSCO before the Site development begins.

The estimated quantity of soil/fill to be removed from the Site is 22,000 CY. The actual excavated volume will be reported in the Final Engineering Report (FER) as a tally of the manifests and tickets of the soils disposed off-site.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

Approximately 22,000 CY of material may be required to be excavated during construction activities. Any required fill will consist of imported clean fill that meets the requirements per 6 NYCRR Part 375-6.7(d) and the requirements for emerging contaminants sampling per the June 2019 DEC letter.

5.4.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (Residual Contamination Zone). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during development phase, such as excavations for foundations and utility work, prior to issuance of the Certificate of Completion.

All primary contaminant sources identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the Final Engineering Report.

Screening will be performed by qualified environmental professionals. Resumes will be provided for all personnel responsible for field screening (i.e. those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

5.4.2 Stockpile Methods for Contaminated Soils

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

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.

Soil stockpiles will be encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

5.4.3 Materials Excavation and Load Out

The Remediation Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site has been investigated during the remedial investigation work. It has been determined that no risk or impediment to the planned work under this RAWP 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 NYSDOT requirements (and all other applicable transportation requirements).

A truck wash associated with construction activities will be operational during construction. A truck wash is always required for large soil excavation projects such as this. The Remediation Engineer will be responsible for ensuring that all outbound trucks are not causing any off-site tracking of the contaminated soils.

Locations where vehicles enter or exit the Site will be inspected daily for evidence of off-Site sediment tracking.

The Remediation Engineer will ensure that all egress points for truck and equipment transported from the Site will be clean of dirt and other materials derived from the Site

during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

The Volunteer and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

5.4.4 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.

Truck transport routes will be included in the SOP. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed in-bound and out-bound truck routes to the Site will take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site 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, which was sought and obtained during the SEQRA EIS process

Trucks will be prohibited from stopping and idling in the neighborhood outside the project 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 in order to minimize off-Site disturbance. Off-Site queuing will be prohibited.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

A tracking pad will be installed at the Site egress to ensure clean-up of the soils from the truck tires. If needed, truck tires will be washed. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

5.4.5 Materials Disposal Off-Site

Approval from appropriate disposal facilities will be received prior to start of work. The total quantity of material expected to be disposed off-site is 22,000 CY.

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

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt

of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DSHM. This material is prohibited from being sent or redirected to a Part 360-16 Registration Facility. In this case, as dictated by DSHM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-site or off-site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The Final Engineering Report will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill of Lading system or equivalent will be used for off-site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes, if any, derived from on-site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization will be performed for off-site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the FER. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

5.4.7 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. If any liquids need to be discharged into the sewer system, then approval by local utility authority and NYSDEC will be sought prior to the discharge. Dewatered fluids will not be recharged back to the land surface or subsurface of the Site without DEC approval.

Water generated during remedial construction will not be discharged to surface waters (i.e. a local pond, stream or river) without a SPDES permit.

5.4.8 Demarcation

A land survey will be performed by a New York State licensed surveyor, of the Site if a track 2 clean-up has been selected after the completion of related construction activities. The survey will define the top elevation of residual contaminated soils. This survey will constitute the written record of the upper surface of the 'Residuals Management Zone' in the Site Management Plan. A map showing the survey results will be included in the Final Engineering Report and the Site Management Plan.

5.4.9 Backfill from Off-Site Sources

Backfilling is not expected. However, if necessary material imported to be used on-site as backfill will be sampled at a frequency of, one composite sample per 500 cubic yards of material from each off-site borrow area. If more than 1,000 cubic yards of soil are needed from the same source area and both samples of the first 1,000 cubic yards meet the USCOs, the sample frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow

sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, provided all earlier samples met the Unrestricted Use SCOs. The samples will be analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL Semi-Volatile Organic Compounds (SVOCs), pesticides, PCBs, and TAL metals, including cyanide. The soil may be used as cover material provided that all parameters meet the USCOs, per the NYSDEC regulatory requirements. The imported material, if needed, will be sampled in accordance with DER-10 Section 5.4 (e) Table 5.4 (e)10 and paragraph 10. In addition, composite samples will be collected for emerging contaminants in accordance with the NYSDEC June 2019 letter for emerging contaminants sampling.

All materials proposed for import onto the Site, will meet the USCO, will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site. A “Soil Reuse/Import” form will be submitted to the NYSDEC for pre-approval prior to importing any soils on -Site. Bills of Lading or equivalent documentation will be obtained to track the amount soil arriving onto the Site and verify the source of soil being imported.

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

The Final Engineering Report will include the following certification by the Remedial Engineer: “I certify that all import of soils from off-Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan”.

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC will be construed as an approval for this purpose.

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. Nothing in this Remedial Action Work Plan will be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers.

5.4.10 Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs, and emerging contaminants).

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. These findings will be also included in daily and periodic electronic media reports.

5.4.11 Community Air Monitoring Plan

A copy of the CAMP for the Site is included as **Appendix F.** Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

5.4.13 Odor, Dust and Nuisance Control Plan

Odor, dust and nuisance control will be in accordance with the site-specific Health and Safety Plan included as **Appendix D**.

The FER will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

Odor Control Plan

This odor control plan is designed to control emissions of nuisance odors off-Site. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the

responsibility of the Applicant's Remediation Engineer, who is responsible for certifying the Final Engineering Report.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (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 deodorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved, as appropriate, by a combination of work stoppages, sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

Dust Control Plan

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

- 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 will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water truck sprinkling.

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 and will conform, at a minimum, to local noise control standards.

6.0 ENGINEERING CONTROLS

6.1 MONITORED NATURAL ATTENUATION

The excavation of the soils will remove any potential sources that may have resulted in groundwater contamination. SESI has evaluated the water quality data for monitored natural attenuation (MNA) such as: dissolved oxygen (DO), oxidation reductive potential (ORP), acidity, (pH),. During the sampling event of May 15, 2019, the measurements at MW-3S were ORP at < 50 mV, very low DO (< 0.4 mg/L), and pH at 7.3. These conditions are conducive to reductive dichlorination of the TCE. However, the measurements at MW-4, High DO and ORP > 110 are not conducive to reductive dichlorination of the TCE. We will continue to monitor ORP, DO, pH CO_2, and specific conductance and include in the next round of sampling nitrate, ferrous iron, sulfate, methane, ethene and dissolved organic carbon (DOC) to fully assess if a reductive dichlorination process is occurring.

6.1.2 Groundwater Monitoring System

A network of groundwater monitoring wells (see **Figure 2.4**) will be utilized to monitor the groundwater quality and to demonstrate the reduction in groundwater contamination to asymptotic levels. As the dissolved groundwater impacts detected during the remedial investigation are relatively low, long-term monitoring program with associated institutional controls will be a cost effective remedial alternative to address these impacts.

Specifically, the groundwater samples will be collected annually, in accordance with requirement outlined in DER-10. The groundwater samples will be analyzed for VOCs, PAHs and metals. MNA parameters such as dissolved oxygen (DO), oxidation reductive potential (ORP), acidity, (pH), and other parameters will be collected and evaluated to determine the MNA effectiveness on the Site.

This monitoring protocol will be described in the Site Management Plan.

6.1.3 Criteria for Completion of Remediation/Termination of Groundwater monitoring

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC, until residual groundwater COC concentrations are found to be consistently below NYSDEC standards or have become asymptotic at levels accepted by the NYSDEC over a period of time. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional treatment and/or control measures will be evaluated. These monitoring activities will be outlined in the Monitoring Plan of the SMP.

If the MNA evaluation does not result in effective destruction of groundwater contamination, in situ treatment technologies will be designed and proposed to attain the groundwater quality standards. The technology to be considered will include in site reduction bioremediation, in site chemical reduction (zero valent iron), or is-situ oxidation.

6.2 SUB-SLAB DEPRESSURIZATION SYSTEM

A passive SSDS will be installed in any proposed building including the following elements:

- Venting layer: a layer of stone installed underneath the building slab;
- Pipes: A network or perforated pipes that are imbedded in the venting layer and connected together with header pipes;
- Risers: the risers are solid pipes that are connected to the header pipes and vent to the outside of the building;
- Vapor barrier: a layer of impermeable membrane installed directly under the building slab and directly above the venting layer; and
- Sampling ports to collect sub slab soil vapor samples

The passive SSDS will be designed with capability to be turned active, if needed. The sub slab soil vapor samples will be collected on a yearly basis along with indoor air samples. If the soil vapor monitoring reaches levels that are below the “No Action” soil

vapor concentrations, the SSDS will cease to act as an EC. The designs of the proposed buildings on the Site have not been completed as of the preparation of this RAWP. Once the design is completed, a SSDS design will be submitted as an addendum to this RAWP for NYSDEC and NYSDOH approval.

7.0 INSTITUTIONAL CONTROLS

After the remedy is complete, the Site may have groundwater residual contamination remaining in place.

7.1 ENVIRONMENTAL EASEMENT

An institutional control (IC) for Monitored Natural Attenuation, the SSDS, and soil vapor monitoring will be incorporated into a Site Management Plan and will be enforceable through an Environmental Easement. An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. Because groundwater is expected to reach class GA AWQS or asymptotic levels within less than 5-years, this IC is allowed as part of a Track 1 remedy.

As part of this remedy, if required, an Environmental Easement approved by NYSDEC will be filed and recorded with the Westchester County Clerk. The Environmental Easement will be submitted as part of the FER.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement will be recorded with the Westchester County Clerk before the Certificate of Completion is issued by NYSDEC. Groundwater monitoring will be performed as defined in the SMP, but there are no other engineering controls anticipated.

7.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion for the Remedial Action. If an SMP is needed because of the residual groundwater and soil vapor contamination, it will be submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual groundwater contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC, particularly as they pertain to the future phases of development construction proposed for the Site. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of a Monitoring Plan; (3)

submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (4) defining criteria for termination of monitoring. The SMP for this Site, if needed, will not require the development of a plan to operate and maintain treatment, collection, containment, or recovery systems because the only proposed on-going remedy will be monitoring the wells.

To address these needs, this SMP will include four plans as applicable: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010, and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annually. The Site Management Plan will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

The SMP and the FER will include a monitoring plan for groundwater at the down-gradient Site perimeter to evaluate Site-wide performance of the remedy. Groundwater monitoring wells will be installed immediately down-gradient of all remediation areas to monitor the natural attenuation. If the contaminants in groundwater do not attenuate below the Class GA AWQS concentrations or reach an asymptotic level that is accepted by the NYSDEC, an active treatment (e.g. oxidant injection) will be proposed and designed based on the monitoring data.

No exclusions for handling of residual contaminated soils will be provided in the Site SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

8.0 FINAL ENGINEERING REPORT

A FER and Site Management Plan will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The FER will include as-built drawings for all constructed elements, certifications, manifests, bills of lading as well as the complete Site Management Plan. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement. This determination will be made by NYSDEC in the context of the FER review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

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

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

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual

contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

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

Before approval of a FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF).

8.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The certification will be signed by the Remedial Engineer Fuad Dahan who is a Professional Engineer registered in New York State. This certification will be appropriately signed and stamped. The certification will include the following statements:

I _____certify that I am currently a NYS registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program, and I certify that the Remedial Work Plan was implemented and that all construction activities were completed in substantial conformance with the DER-approved Remedial Work Plan.

I certify that all use restrictions, institutional controls, engineering controls and/or any operation and maintenance requirements applicable to the site are contained in an environmental easement created and recorded pursuant to ECL 71-3605 and that any affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of any engineering controls employed at the site including the proper maintenance of any remaining monitoring wells, and that such plan has been approved by DER.

TABLES

Table 1A
Summary of Soil Sampling Results
Volatile Organic Compounds (8260)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-19 S-9 (2.5-3) 5/8/2019 10:45 AM	460-181467-20 S-9 (8-8.5) 5/8/2019 10:50 AM	460-181467-21 S-9 (14.5-15) 5/8/2019 10:55 AM	460-181467-22 S-9 (17.5-18) 5/8/2019 11:15 AM	460-181467-23 S-9 (23.5-24) 5/8/2019 11:20 AM	460-181467-13 S-10 (4-4.5) 5/8/2019 9:35 AM	460-181467-14 S-10 (8.5-9) 5/8/2019 9:40 AM	460-181467-15 S-10 (11.5-12) 5/8/2019 9:50 AM	460-181467-10 S-11 (2.2-2.5) 5/8/2019 9:15 AM	460-181467-11 S-11 (6.5-7) 5/8/2019 9:20 AM	460-181467-12 S-11 (13-13.5) 5/8/2019 9:30 AM	460-181391-32 S-12 (2-2.5) 5/7/2019 10:00 AM	460-181391-23 S-12 (6.5-7) 5/7/2019 10:15 AM	460-181391-24 S-12 (11-11.5) 5/7/2019 10:20 AM	460-181391-31 S-13 (2-2.5) 5/7/2019 9:30 AM	460-181391-8 S-13 (8-8.5) 5/7/2019 9:40 AM	460-181391-14 S-13 (11.5-12) 5/7/2019 9:50 AM	460-181391-28 S-14 (4-4.5) 5/7/2019 9:15 AM	460-181391-33 S-14 (9-9.5) 5/7/2019 9:16 AM	460-181391-3 S-14 (10.5-11) 5/7/2019 9:25 AM
SOIL BY 8260C																							
1,1,1-Trichloroethane	mg/Kg	0.68	100	0.00025 U	0.00020 U	0.00018 U	0.00020 U	0.00020 U	0.00021 U	0.00018 U	0.00019 U	0.00021 U	0.00020 U	0.00019 U	0.00024 U	0.00025 U	0.00023 U	0.00030 U	0.00022 U	0.00021 U	0.00023 U	0.00022 U	0.00024 U
1,1,2,2-Tetrachloroethane	mg/Kg			0.00023 U	0.00018 U	0.00016 U	0.00018 U	0.00018 U	0.00019 U	0.00017 U	0.00017 U	0.00019 U	0.00018 U	0.00018 U	0.00022 U	0.00023 U	0.00021 U	0.00028 U	0.00020 U	0.00020 U	0.00021 U	0.00020 U	0.00022 U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg			0.00033 U	0.00025 U	0.00023 U	0.00026 U	0.00026 U	0.00027 U	0.00024 U	0.00024 U	0.00027 U	0.00026 U	0.00025 U	0.00030 U	0.00032 U	0.00029 U	0.00039 U	0.00028 U	0.00028 U	0.00030 U	0.00028 U	0.00031 U
1,1,2-Trichloroethane	mg/Kg			0.00019 U	0.00015 U	0.00014 U	0.00015 U	0.00015 U	0.00016 U	0.00014 U	0.00014 U	0.00016 U	0.00015 U	0.00015 U	0.00018 U	0.00019 U	0.00017 U	0.00023 U	0.00017 U	0.00016 U	0.00018 U	0.00017 U	0.00018 U
1,1-Dichloroethane	mg/Kg	0.27	26	0.00022 U	0.00017 U	0.00016 U	0.00018 U	0.00018 U	0.00018 U	0.00016 U	0.00016 U	0.00018 U	0.00018 U	0.00017 U	0.00021 U	0.00022 U	0.00020 U	0.00027 U	0.00019 U	0.00019 U	0.00020 U	0.00019 U	0.00021 U
1,1-Dichloroethene	mg/Kg	0.33	100	0.00024 U	0.00019 U	0.00017 U	0.00019 U	0.00019 U	0.00020 U	0.00018 U	0.00018 U	0.00020 U	0.00019 U	0.00018 U	0.00023 U	0.00024 U	0.00022 U	0.00029 U	0.00021 U	0.00021 U	0.00022 U	0.00021 U	0.00023 U
1,2,3-Trichlorobenzene	mg/Kg			0.00020 U	0.00015 U	0.00014 U	0.00015 U	0.00015 U	0.00016 U	0.00014 U	0.00014 U	0.00016 U	0.00015 U	0.00015 U	0.00018 U	0.00019 U	0.00018 U	0.00023 U	0.00017 U	0.00017 U	0.00018 U	0.00017 U	0.00019 U
1,2,4-Trichlorobenzene	mg/Kg			0.00010 U	0.000077 U	0.000070 U	0.000078 U	0.000078 U	0.000081 U	0.000072 U	0.000074 U	0.000082 U	0.000079 U	0.000076 U	0.000093 U	0.000097 U	0.000090 U	0.00012 U	0.000087 U	0.000084 U	0.000091 U	0.000087 U	0.000095 U
1,2-Dibromo-3-Chloropropane	mg/Kg			0.00050 U	0.00039 U	0.00035 U	0.00039 U	0.00039 U	0.00041 U	0.00036 U	0.00037 U	0.00041 U	0.00039 U	0.00038 U	0.00046 U	0.00049 U	0.00045 U	0.00059 U	0.00043 U	0.00042 U	0.00046 U	0.00043 U	0.00047 U
1,2-Dichlorobenzene	mg/Kg	1.1	100	0.00016 U	0.00012 U	0.00011 U	0.00012 U	0.00012 U	0.00013 U	0.00011 U	0.00012 U	0.00013 U	0.00012 U	0.00012 U	0.00015 U	0.00015 U	0.00014 U	0.00019 U	0.00014 U	0.00013 U	0.00014 U	0.00014 U	0.00015 U
1,2-Dichloroethane	mg/Kg	0.02	3.1	0.00032 U	0.00025 U	0.00022 U	0.00025 U	0.00025 U	0.00026 U	0.00023 U	0.00024 U	0.00026 U	0.00025 U	0.00024 U	0.00030 U	0.00031 U	0.00029 U	0.00038 U	0.00028 U	0.00027 U	0.00029 U	0.00028 U	0.00030 U
1,2-Dichloropropane	mg/Kg			0.00046 U	0.00036 U	0.00032 U	0.00036 U	0.00036 U	0.00037 U	0.00033 U	0.00034 U	0.00038 U	0.00036 U	0.00035 U	0.00043 U	0.00045 U	0.00041 U	0.00055 U	0.00040 U	0.00039 U	0.00042 U	0.00040 U	0.00044 U
1,3-Dichlorobenzene	mg/Kg	2.4	49	0.00017 U	0.00013 U	0.00012 U	0.00014 U	0.00014 U	0.00014 U	0.00012 U	0.00013 U	0.00014 U	0.00014 U	0.00013 U	0.00016 U	0.00017 U	0.00016 U	0.00021 U	0.00015 U	0.00015 U	0.00016 U	0.00015 U	0.00016 U
1,4-Dichlorobenzene	mg/Kg	1.8	13	0.00011 U	0.000084 U	0.000076 U	0.000085 U	0.000085 U	0.000089 U	0.000079 U	0.000080 U	0.000089 U	0.000085 U	0.000082 U	0.00010 U	0.00011 U	0.000098 U	0.00013 U	0.000095 U	0.000091 U	0.000099 U	0.000094 U	0.00010 U
2-Butanone (MEK)	mg/Kg	0.12	100	0.0012 U	0.00093 U	0.00084 U	0.00094 U	0.00095 U	0.00098 U	0.00087 U	0.00089 U	0.00099 U	0.00095 U	0.00091 U	0.0011 U	0.0012 U	0.0011 U	0.0014 U	0.0010 U	0.0010 U	0.0011 U	0.0010 U	**0.0015 J**
2-Hexanone	mg/Kg			0.00084 U	0.00066 U	0.00059 U	0.00066 U	0.00067 U	0.00069 U	0.00061 U	0.00062 U	0.00069 U	0.00067 U	0.00064 U	0.00079 U	0.00082 U	0.00076 U	0.0010 U	0.00074 U	0.00071 U	0.00078 U	0.00074 U	0.00080 U
4-Methyl-2-pentanone (MIBK)	mg/Kg			0.00072 U	0.00056 U	0.00050 U	0.00056 U	0.00057 U	0.00059 U	0.00052 U	0.00053 U	0.00059 U	0.00057 U	0.00055 U	0.00067 U	0.00070 U	0.00065 U	0.00086 U	0.00063 U	0.00061 U	0.00066 U	0.00063 U	0.00068 U
Acetone	mg/Kg	0.05	100	0.0041 U	**0.0063**	**0.0037 J**	0.0039 J	0.0032 U	0.0034 J	0.0030 U	0.0030 U	0.0034 U	**0.0037 J**	0.0031 U	0.0038 U	0.0040 U	0.011	0.0049 U	0.0036 U	0.0035 U	0.0038 U	**0.0037 J**	**0.022**
Benzene	mg/Kg	0.06	4.8	0.00028 U	0.00022 U	0.00020 U	0.00022 U	0.00022 U	0.00023 U	0.00020 U	0.00021 U	0.00023 U	0.00022 U	0.00021 U	0.00026 U	0.00027 U	0.00025 U	0.00033 U	0.00024 U	0.00024 U	0.00026 U	0.00024 U	0.00027 U
Bromoform	mg/Kg			0.00046 U	0.00036 U	0.00032 U	0.00036 U	0.00036 U	0.00038 U	0.00033 U	0.00034 U	0.00038 U	0.00036 U	0.00035 U	0.00043 U	0.00045 U	0.00041 U	0.00055 U	0.00040 U	0.00039 U	0.00042 U	0.00040 U	0.00044 U
Bromomethane	mg/Kg			0.00051 U	0.00040 U	0.00036 U	0.00040 U	0.00040 U	0.00042 U	0.00037 U	0.00038 U	0.00042 U	0.00040 U	0.00039 U	0.00048 U	0.00050 U	0.00046 U	0.00061 U	0.00045 U	0.00043 U	0.00047 U	0.00045 U	0.00049 U
Carbon disulfide	mg/Kg			0.00029 U	0.00022 U	0.00020 U	0.00023 U	0.00023 U	0.00024 U	0.00021 U	0.00021 U	0.00024 U	0.00023 U	0.00022 U	0.00027 U	0.00028 U	0.00026 U	0.00034 U	0.00025 U	0.00024 U	0.00026 U	0.00025 U	0.00027 U
Carbon tetrachloride	mg/Kg	0.76	2.4	**0.0014**	**0.00091**	**0.00032 J B**	0.00015 U	0.00028 J B	0.00035 J	0.00014 U	0.00073 J	**0.00037 J**	**0.00096**	**0.00043 J**	0.00057 J B	0.00049 J B	0.00066 J B	0.00023 U	**0.00041 J B**	**0.00032 J B**	**0.00049 J B**	**0.00058 J B**	**0.0012 B**
Chlorobenzene	mg/Kg	1.1	100	0.00019 U	0.00015 U	0.00013 U	0.00015 U	0.00015 U	0.00016 U	0.00014 U	0.00014 U	0.00016 U	0.00015 U	0.00015 U	0.00018 U	0.00019 U	0.00017 U	0.00023 U	0.00017 U	0.00016 U	0.00018 U	0.00017 U	0.00018 U
Chlorobromomethane	mg/Kg			0.00030 U	0.00024 U	0.00021 U	0.00024 U	0.00024 U	0.00025 U	0.00022 U	0.00022 U	0.00025 U	0.00024 U	0.00023 U	0.00028 U	0.00030 U	0.00027 U	0.00036 U	0.00027 U	0.00026 U	0.00028 U	0.00027 U	0.00029 U
Chlorodibromomethane	mg/Kg			0.00021 U	0.00016 U	0.00015 U	0.00016 U	0.00017 U	0.00017 U	0.00015 U	0.00016 U	0.00017 U	0.00017 U	0.00016 U	0.00020 U	0.00020 U	0.00019 U	0.00025 U	0.00018 U	0.00018 U	0.00019 U	0.00018 U	0.00020 U
Chloroethane	mg/Kg			0.00057 U	0.00044 U	0.00040 U	0.00044 U	0.00045 U	0.00046 U	0.00041 U	0.00042 U	0.00046 U	0.00045 U	0.00043 U	0.00053 U	0.00055 U	0.00051 U	0.00067 U	0.00049 U	0.00048 U	0.00052 U	0.00049 U	0.00054 U
Chloroform	mg/Kg	0.37	49	0.00035 U	0.00027 U	0.00024 U	0.00027 U	0.00027 U	0.00028 U	0.00025 U	0.00026 U	0.00028 U	0.00027 U	0.00026 U	0.00032 U	0.00034 U	0.00031 U	0.00041 U	0.00030 U	0.00029 U	0.00032 U	0.00030 U	0.00033 U
Chloromethane	mg/Kg			0.00047 U	0.00037 U	0.00033 U	0.00037 U	0.00037 U	0.00039 U	0.00034 U	0.00035 U	0.00039 U	0.00037 U	0.00036 U	0.00044 U	0.00046 U	0.00042 U	0.00056 U	0.00041 U	0.00040 U	0.00043 U	0.00041 U	0.00045 U
cis-1,2-Dichloroethene	mg/Kg	0.25	100	0.00016 U	0.00013 U	0.00012 U	0.00013 U	0.00013 U	0.00013 U	0.00012 U	0.00012 U	0.00014 U	0.00013 U	0.00012 U	0.00015 U	0.00016 U	0.00015 U	0.00020 U	0.00014 U	0.00014 U	0.00015 U	0.00014 U	0.00016 U
cis-1,3-Dichloropropene	mg/Kg			0.00030 U	0.00023 U	0.00021 U	0.00023 U	0.00023 U	0.00024 U	0.00021 U	0.00022 U	0.00024 U	0.00023 U	0.00022 U	0.00028 U	0.00029 U	0.00027 U	0.00035 U	0.00026 U	0.00025 U	0.00027 U	0.00026 U	0.00028 U
Cyclohexane	mg/Kg			0.00024 U	0.00019 U	0.00017 U	0.00019 U	0.00019 U	0.00020 U	0.00017 U	0.00018 U	0.00020 U	0.00019 U	0.00018 U	0.00022 U	0.00023 U	0.00022 U	0.00029 U	0.00021 U	0.00020 U	0.00022 U	0.00021 U	0.00023 U
Dichlorobromomethane	mg/Kg			0.00028 U	0.00022 U	0.00020 U	0.00022 U	0.00022 U	0.00023 U	0.00020 U	0.00021 U	0.00023 U	0.00022 U	0.00021 U	0.00026 U	0.00027 U	0.00025 U	0.00033 U	0.00024 U	0.00023 U	0.00026 U	0.00024 U	0.00026 U
Dichlorodifluoromethane	mg/Kg			0.00037 U	0.00028 U	0.00026 U	0.00029 U	0.00029 U	0.00030 U *	0.00027 U	0.00027 U	0.00030 U *	0.00029 U *	0.00028 U *	0.00034 U	0.00036 U	0.00033 U	0.00044 U	0.00032 U	0.00031 U	0.00034 U	0.00032 U	0.00035 U
Ethylbenzene	mg/Kg	1	41	0.00022 U	0.00017 U	0.00015 U	0.00017 U	0.00017 U	0.00018 U	0.00016 U	0.00016 U	0.00018 U	0.00017 U	0.00016 U	0.00020 U	0.00021 U	0.00019 U	0.00026 U	0.00019 U	0.00018 U	0.00020 U	0.00019 U	0.00020 U
Ethylene Dibromide	mg/Kg			0.00019 U	0.00015 U	0.00014 U	0.00015 U	0.00015 U	0.00016 U	0.00014 U	0.00014 U	0.00016 U	0.00015 U	0.00015 U	0.00018 U	0.00019 U	0.00018 U	0.00023 U	0.00017 U	0.00016 U	0.00018 U	0.00017 U	0.00019 U
Isopropylbenzene	mg/Kg			0.00014 U	0.00011 U	0.000096 U	0.00011 U	0.00011 U	0.00011 U	0.000099 U	0.00010 U	0.00011 U	0.00011 U	0.00010 U	0.00013 U	0.00013 U	0.00012 U	0.00016 U	0.00012 U	0.00012 U	0.00013 U	0.00012 U	0.00013 U
Methyl acetate	mg/Kg			0.0047 U	0.0036 U	0.0033 U	0.0037 U	0.0037 U	0.0038 U	0.0034 U	0.0034 U	0.0038 U	0.0037 U	0.0035 U	0.0043 U	0.0045 U	0.0042 U	0.0055 U	0.0041 U	0.0039 U	0.0043 U	0.0041 U	0.0044 U
Methyl tert-butyl ether	mg/Kg	0.93	100	0.00014 U	0.00011 U	0.000095 U	0.00011 U	0.00011 U	0.00011 U	0.000098 U	0.00010 U	0.00011 U	0.00011 U	0.00010 U	0.00013 U	0.00013 U	0.00012 U	0.00016 U	0.00012 U *	0.00011 U *	0.00012 U	0.00012 U	0.00013 U *
Methylcyclohexane	mg/Kg			0.00017 U	0.00013 U	0.00012 U	0.00014 U	0.00014 U	0.00014 U	0.00013 U	0.00013 U	0.00014 U	0.00014 U	0.00013 U	0.00016 U	0.00017 U	0.00016 U	0.00021 U	0.00015 U	0.00015 U	0.00016 U	0.00015 U	0.00016 U
Methylene Chloride	mg/Kg	0.05	100	0.00018 U	0.00014 U	0.00012 U	0.00020 J	0.00021 J	0.00031 J	0.00035 J	0.00023 J	0.00015 U	**0.00032 J**	0.00013 U	0.00070 J	0.00072 J	0.00058 J	**0.0014**	**0.00074 J**	**0.00034 J**	0.00016 U	**0.00019 J**	0.00017 U
m-Xylene & p-Xylene	mg/Kg	0.26	100	0.00019 U	0.00015 U	0.00013 U	0.00015 U	0.00015 U	0.00015 U	0.00014 U	0.00014 U	0.00015 U	0.00015 U	0.00014 U	0.00018 U	0.00019 J	0.00017 U	0.00022 U	0.00016 U	0.00016 U	0.00016 U	0.00017 U	**0.00031 J**
o-Xylene	mg/Kg	0.26	100	0.00010 U	0.000080 U	0.000072 U	0.000081 U	0.000081 U	0.000084 U	0.000075 U	0.000076 U	0.000085 U	0.000081 U	0.000078 U	0.000096 U	0.00010 U	0.000093 U	0.00012 U	0.000090 U	0.000087 U	0.000094 U	0.000090 U	0.000098 U
Styrene	mg/Kg			0.00013 U	0.00010 U	0.000093 U	0.00010 U	0.00010 U	0.00011 U	0.000097 U	0.000098 U	0.00011 U	0.00010 U	0.00010 U	0.00012 U	0.00013 U	0.00012 U	0.00016 U	0.00012 U	0.00011 U	0.00012 U	0.00012 U	0.00013 U
Tetrachloroethene	mg/Kg	1.3	19	0.00015 U	0.00012 U	0.00011 U	0.00012 U	0.00012 U	0.00013 U	0.00011 U	0.00011 U	0.00013 U	0.00012 U	0.00012 U	0.00014 U	0.00015 U	0.00014 U	0.00018 U	0.00014 U	0.00013 U	0.00014 U	0.00014 U	0.00015 U
Toluene	mg/Kg	0.7	100	0.00068 U	0.00053 U	0.00047 U	0.00053 U	0.00053 U	0.00055 U	0.00049 U	0.00050 U	0.00056 U	0.00053 U	0.00051 U	0.00063 U	0.00066 U	0.00061 U	0.00081 U	0.00059 U	0.00057 U	0.00062 U	0.00059 U	0.00064 U
trans-1,2-Dichloroethene	mg/Kg	0.19	100	0.00027 U	0.00021 U	0.00019 U	0.00021 U	0.00021 U	0.00022 U	0.00019 U	0.00020 U	0.00022 U	0.00021 U	0.00020 U	0.00025 U	0.00026 U	0.00024 U	0.00032 U	0.00023 U	0.00022 U	0.00024 U	0.00023 U	0.00025 U
trans-1,3-Dichloropropene	mg/Kg			0.00029 U	0.00022 U	0.00020 U	0.00023 U	0.00023 U	0.00024 U	0.00021 U	0.00021 U	0.00024 U	0.00023 U	0.00022 U	0.00027 U	0.00028 U	0.00026 U	0.00034 U	0.00025 U	0.00024 U	0.00026 U	0.00025 U	0.00027 U
Trichloroethene	mg/Kg	0.47	21	0.00016 U	0.00012 U	0.00011 U	0.00012 U	0.00012 U	0.00013 U	0.00011 U	0.00012 U	0.00013 U	0.00012 U	0.00012 U	0.00050 J	0.00015 U	0.00014 U	0.00019 U	0.00014 U	0.00013 U	0.00014 U	0.00014 U	0.00015 U
Trichlorofluoromethane	mg/Kg			0.00044 U	0.00034 U	0.00031 U	0.00035 U	0.00035 U	0.00036 U	0.00032 U	0.00032 U	0.00036 U	0.00035 U	0.00033 U	0.00041 U	0.00043 U	0.00040 U	0.00052 U	0.00038 U	0.00037 U	0.00040 U	0.00038 U	0.00042 U
Vinyl chloride	mg/Kg	0.02	0.9	0.00059 U	0.00046 U	0.00041 U	0.00046 U	0.00047 U	0.00048 U	0.00043 U	0.00044 U	0.00049 U	0.00047 U	0.00045 U	0.00055 U	0.00058 U	0.00053 U	0.00070 U	0.00052 U	0.00050 U	0.00054 U	0.00052 U	0.00056 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1A
Summary of Soil Sampling Results
Volatile Organic Compounds (8260)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-1 S-15 (2-2.5) 5/7/2019 8:55 AM	460-181391-30 S-15 (8-8.5) 5/7/2019 9:00 AM	460-181391-2 S-15 (11-11.5) 5/7/2019 9:10 AM	460-181391-19 S-16 (3-3.5) 5/7/2019 8:25 AM	460-181391-6 S-16 (7-7.5) 5/7/2019 8:40 AM	460-181391-7 S-16 (11.5-12) 5/7/2019 8:50 AM	460-181391-26 S-17 (3-3.5) 5/7/2019 11:25 AM	460-181391-18 S-17 (7-7.5) 5/7/2019 11:35 AM	460-181391-9 S-17 (13.5-14) 5/7/2019 11:45 AM	460-181391-27 S-18 (2-2.5) 5/7/2019 11:50 AM	460-181391-16 S-18 (6-6.5) 5/7/2019 12:00 PM	460-181391-15 S-18 (12-12.5) 5/7/2019 12:10 PM	460-181391-36 S-19 (1.5-2) 5/7/2019 12:20 PM	460-181391-25 S-19 (7-7.5) 5/7/2019 12:30 PM	460-181391-10 S-19 (12-12.5) 5/7/2019 12:40 PM	460-181391-5 S-20 (4.5-5) 5/7/2019 10:35 AM	460-181391-17 S-20 (9-9.5) 5/7/2019 10:45 AM	460-181391-34 S-20 (14-14.5) 5/7/2019 10:55 AM	460-181391-22 S-20 (17-17.5) 5/7/2019 11:05 AM	460-181391-21 S-20 (20-20.5) 5/7/2019 11:15 AM
SOIL BY 8260C																							
1,1,1-Trichloroethane	mg/Kg	0.68	100	0.00029 U	0.00023 U	0.00020 U	0.00028 U	0.00019 U	0.00021 U	0.00027 U	0.00023 U	0.00021 U	0.00028 U	0.00023 U	0.00022 U	0.00029 U	0.00023 U	0.00023 U	0.00027 U	0.00023 U	0.00022 U	0.00022 U	0.00023 U
1,1,2,2-Tetrachloroethane	mg/Kg			0.00026 U	0.00021 U	0.00019 U	0.00025 U	0.00018 U	0.00020 U	0.00024 U	0.00021 U	0.00020 U	0.00026 U	0.00021 U	0.00020 U	0.00027 U	0.00021 U	0.00021 U	0.00025 U	0.00021 U	0.00020 U	0.00020 U	0.00021 U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg			0.00037 U	0.00030 U	0.00026 U	0.00036 U	0.00025 U	0.00028 U	0.00034 U	0.00030 U	0.00028 U	0.00037 U	0.00030 U	0.00028 U	0.00038 U	0.00030 U	0.00029 U	0.00035 U	0.00030 U	0.00029 U	0.00028 U	0.00029 U
1,1,2-Trichloroethane	mg/Kg			0.00022 U	0.00018 U	0.00016 U	0.00021 U	0.00015 U	0.00016 U	0.00020 U	0.00018 U	0.00016 U	0.00022 U	0.00017 U	0.00017 U	0.00022 U	0.00018 U	0.00017 U	0.00021 U	0.00018 U	0.00017 U	0.00017 U	0.00017 U
1,1-Dichloroethane	mg/Kg	0.27	26	0.00025 U	0.00021 U	0.00018 U	0.00025 U	0.00017 U	0.00019 U	0.00024 U	0.00020 U	0.00019 U	0.00025 U	0.00020 U	0.00019 U	0.00026 U	0.00020 U	0.00020 U	0.00024 U	0.00021 U	0.00020 U	0.00019 U	0.00020 U
1,1-Dichloroethene	mg/Kg	0.33	100	0.00028 U	0.00023 U	0.00020 U	0.00027 U	0.00019 U	0.00021 U	0.00026 U	0.00022 U	0.00021 U	0.00027 U	0.00022 U	0.00021 U	0.00028 U	0.00022 U	0.00022 U	0.00026 U	0.00022 U	0.00021 U	0.00021 U	0.00022 U
1,2,3-Trichlorobenzene	mg/Kg			0.00022 U	0.00018 U	0.00016 U	0.00022 U	0.00015 U	0.00017 U	0.00021 U	0.00018 U	0.00017 U	0.00022 U	0.00018 U	0.00017 U	0.00023 U	0.00018 U	0.00018 U	0.00021 U	0.00018 U	0.00017 U	0.00017 U	0.00018 U
1,2,4-Trichlorobenzene	mg/Kg			0.00011 U	0.000092 U	0.000081 U	0.00011 U	0.000076 U	0.000084 U	0.00011 U	0.000091 U	0.000085 U	0.00011 U	0.000090 U	0.000086 U	0.00012 U	0.000091 U	0.000090 U	0.00011 U	0.000092 U	0.000087 U	0.000086 U	0.000090 U
1,2-Dibromo-3-Chloropropane	mg/Kg			0.00057 U	0.00046 U	0.00040 U	0.00055 U	0.00038 U	0.00042 U	0.00053 U	0.00045 U	0.00042 U	0.00056 U	0.00045 U	0.00043 U	0.00058 U	0.00046 U	0.00045 U	0.00053 U	0.00046 U	0.00044 U	0.00043 U	0.00045 U
1,2-Dichlorobenzene	mg/Kg	1.1	100	0.00018 U	0.00014 U	0.00013 U	0.00017 U	0.00012 U	0.00013 U	0.00016 U	0.00014 U	0.00013 U	0.00018 U	0.00014 U	0.00013 U	0.00018 U	0.00014 U	0.00014 U	0.00017 U	0.00014 U	0.00014 U	0.00014 U	0.00014 U
1,2-Dichloroethane	mg/Kg	0.02	3.1	0.00036 U	0.00030 U	0.00026 U	0.00035 U	0.00024 U	0.00027 U	0.00034 U	0.00029 U	0.00027 U	0.00036 U	0.00029 U	0.00028 U	0.00037 U	0.00029 U	0.00029 U	0.00034 U	0.00030 U	0.00028 U	0.00028 U	0.00029 U
1,2-Dichloropropane	mg/Kg			0.00052 U	0.00042 U	0.00037 U	0.00050 U	0.00035 U	0.00039 U	0.00048 U	0.00042 U	0.00039 U	0.00052 U	0.00042 U	0.00039 U	0.00053 U	0.00042 U	0.00041 U	0.00049 U	0.00042 U	0.00040 U	0.00040 U	0.00041 U
1,3-Dichlorobenzene	mg/Kg	2.4	49	0.00020 U	0.00016 U	0.00014 U	0.00019 U	0.00013 U	0.00015 U	0.00018 U	0.00016 U	0.00015 U	0.00019 U	0.00016 U	0.00015 U	0.00020 U	0.00016 U	0.00016 U	0.00018 U	0.00016 U	0.00015 U	0.00015 U	0.00016 U
1,4-Dichlorobenzene	mg/Kg	1.8	13	0.00012 U	0.00010 U	0.000088 U	0.00012 U	0.000082 U	0.000092 U	0.00011 U	0.000099 U	0.000092 U	0.00012 U	0.000098 U	0.000093 U	0.00013 U	0.000099 U	0.000098 U	0.00012 U	0.00010 U	0.000095 U	0.000094 U	0.000098 U
2-Butanone (MEK)	mg/Kg	0.12	100	0.0014 U	0.0011 U	**0.0043 J**	0.0013 U	0.00091 U	0.0010 U	0.0013 U	0.0011 U	0.0010 U	0.0014 U	0.0011 U	0.0010 U	0.0014 U	0.0011 U	0.0011 U	0.0013 U	0.0011 U	0.0011 U	0.0010 U	0.0011 U
2-Hexanone	mg/Kg			0.00096 U	0.00078 U	0.00068 U	0.00093 U	0.00064 U	0.00071 U	0.00089 U	0.00077 U	0.00072 U	0.00095 U	0.00077 U	0.00073 U	0.00098 U	0.00077 U	0.00076 U	0.00090 U	0.00078 U	0.00074 U	0.00073 U	0.00076 U
4-Methyl-2-pentanone (MIBK)	mg/Kg			0.00082 U	0.00067 U	0.00058 U	0.00079 U	0.00055 U	0.00061 U	0.00076 U	0.00066 U	0.00061 U	0.00081 U	0.00065 U	0.00062 U	0.00084 U	0.00066 U	0.00065 U	0.00077 U	0.00066 U	0.00063 U	0.00062 U	0.00065 U
Acetone	mg/Kg	0.05	100	0.0047 U	**0.0048 J**	**0.023**	0.0045 U	**0.0035 J**	0.0035 U	0.0043 U	**0.0038 J**	**0.0040 J**	0.0046 U	**0.0049**	**0.0043 J**	0.0048 U	**0.0048 J**	**0.0039 J**	0.0044 U	**0.0066**	**0.0040 J**	0.0036 U	**0.0096**
Benzene	mg/Kg	0.06	4.8	0.00032 U	0.00026 U	**0.00023 J**	0.00031 U	0.00021 U	0.00024 U	0.00029 U	0.00025 U	0.00024 U	0.00032 U	0.00025 U	0.00024 U	0.00033 U	0.00026 U	0.00025 U	0.00030 U	0.00026 U	0.00024 U	0.00024 U	0.00025 U
Bromoform	mg/Kg			0.00052 U	0.00043 U	0.00037 U	0.00051 U	0.00035 U	0.00039 U	0.00049 U	0.00042 U	0.00039 U	0.00052 U	0.00042 U	0.00040 U	0.00054 U	0.00042 U	0.00042 U	0.00049 U	0.00042 U	0.00040 U	0.00040 U	0.00041 U
Bromomethane	mg/Kg			0.00058 U	0.00047 U	0.00042 U	0.00056 U	0.00039 U	0.00043 U	0.00054 U	0.00047 U	0.00044 U	0.00058 U	0.00047 U	0.00044 U	0.00060 U	0.00047 U	0.00046 U	0.00055 U	0.00047 U	0.00045 U	0.00044 U	0.00046 U
Carbon disulfide	mg/Kg			0.00033 U	0.00027 U	0.00023 U	0.00032 U	0.00022 U	0.00024 U	0.00030 U	0.00026 U	0.00024 U	0.00032 U	0.00026 U	0.00025 U	0.00034 U	0.00026 U	0.00026 U	0.00031 U	0.00027 U	0.00025 U	0.00025 U	0.00026 U
Carbon tetrachloride	mg/Kg	0.76	2.4	**0.0012 B**	**0.00067 J B**	**0.00075 J B**	**0.00093 J B**	**0.00093 B**	**0.00062 J B**	**0.00084 J B**	0.00018 U	**0.00077 J B**	**0.0010 J B**	**0.00025 J B**	**0.00041 J B**	**0.0012 J B**	**0.00074 J B**	**0.00036 J B**	**0.00051 J B**	**0.00084 J B**	**0.00057 J B**	**0.00031 J B**	**0.0011 B**
Chlorobenzene	mg/Kg	1.1	100	0.00022 U	0.00018 U	0.00016 U	0.00021 U	0.00015 U	0.00016 U	0.00020 U	0.00017 U	0.00016 U	0.00022 U	0.00017 U	0.00016 U	0.00022 U	0.00018 U	0.00017 U	0.00020 U	0.00018 U	0.00017 U	0.00017 U	0.00017 U
Chlorobromomethane	mg/Kg			0.00035 U	0.00028 U	0.00025 U	0.00033 U	0.00023 U	0.00026 U	0.00032 U	0.00028 U	0.00026 U	0.00034 U	0.00028 U	0.00026 U	0.00035 U	0.00028 U	0.00027 U	0.00032 U	0.00028 U	0.00027 U	0.00026 U	0.00027 U
Chlorodibromomethane	mg/Kg			0.00024 U	0.00019 U	0.00017 U	0.00023 U	0.00016 U	0.00018 U	0.00022 U	0.00019 U	0.00018 U	0.00024 U	0.00019 U	0.00018 U	0.00024 U	0.00019 U	0.00019 U	0.00022 U	0.00019 U	0.00018 U	0.00018 U	0.00019 U
Chloroethane	mg/Kg			0.00064 U	0.00052 U	0.00046 U	0.00062 U	0.00043 U	0.00048 U	0.00060 U	0.00052 U	0.00048 U	0.00064 U	0.00051 U	0.00049 U	0.00066 U	0.00052 U	0.00051 U	0.00060 U	0.00052 U	0.00049 U	0.00049 U	0.00051 U
Chloroform	mg/Kg	0.37	49	0.00039 U	0.00032 U	0.00028 U	0.00038 U	0.00026 U	0.00029 U	0.00036 U	0.00032 U	0.00029 U	0.00039 U	0.00031 U	0.00030 U	0.00040 U	0.00032 U	0.00031 U	0.00037 U	0.00032 U	0.00030 U	0.00030 U	0.00031 U
Chloromethane	mg/Kg			0.00054 U	0.00044 U	0.00038 U	0.00052 U	0.00036 U	0.00040 U	0.00050 U	0.00043 U	0.00040 U	0.00053 U	0.00043 U	0.00041 U	0.00055 U	0.00043 U	0.00042 U	0.00050 U	0.00043 U	0.00041 U	0.00041 U	0.00042 U
cis-1,2-Dichloroethene	mg/Kg	0.25	100	0.00019 U	0.00015 U	0.00013 U	0.00018 U	0.00013 U	0.00014 U	0.00017 U	0.00015 U	0.00014 U	0.00019 U	0.00015 U	0.00014 U	0.00019 U	0.00015 U	0.00015 U	0.00018 U	0.00015 U	0.00014 U	0.00014 U	0.00015 U
cis-1,3-Dichloropropene	mg/Kg			0.00034 U	0.00027 U	0.00024 U	0.00033 U	0.00022 U	0.00025 U	0.00031 U	0.00027 U	0.00025 U	0.00033 U	0.00027 U	0.00025 U	0.00034 U	0.00027 U	0.00027 U	0.00032 U	0.00027 U	0.00026 U	0.00026 U	0.00027 U
Cyclohexane	mg/Kg			0.00027 U	0.00022 U	0.00019 U	0.00026 U	0.00018 U	0.00020 U	0.00025 U	0.00022 U	0.00020 U	0.00027 U	0.00022 U	0.00021 U	0.00028 U	0.00022 U	0.00022 U	0.00026 U	0.00022 U	0.00021 U	0.00021 U	0.00022 U
Dichlorobromomethane	mg/Kg			0.00032 U	0.00026 U	0.00023 U	0.00031 U	0.00021 U	0.00024 U	0.00029 U	0.00025 U	0.00024 U	0.00031 U	0.00025 U	0.00024 U	0.00032 U	0.00026 U	0.00025 U	0.00030 U	0.00026 U	0.00024 U	0.00024 U	0.00025 U
Dichlorodifluoromethane	mg/Kg			0.00042 U	0.00034 U	0.00030 U	0.00040 U	0.00028 U	0.00031 U	0.00039 U	0.00033 U	0.00031 U	0.00041 U	0.00033 U	0.00031 U	0.00043 U	0.00034 U	0.00033 U	0.00039 U	0.00034 U	0.00032 U	0.00032 U	0.00033 U
Ethylbenzene	mg/Kg	1	41	0.00025 U	0.00020 U	0.00017 U	0.00024 U	0.00016 U	0.00018 U	0.00023 U	0.00020 U	0.00018 U	0.00024 U	0.00020 U	0.00019 U	0.00025 U	0.00020 U	0.00019 U	0.00023 U	0.00020 U	0.00019 U	0.00019 U	0.00019 U
Ethylene Dibromide	mg/Kg			0.00022 U	0.00018 U	0.00016 U	0.00021 U	0.00015 U	0.00016 U	0.00021 U	0.00018 U	0.00017 U	0.00022 U	0.00018 U	0.00017 U	0.00023 U	0.00018 U	0.00018 U	0.00021 U	0.00018 U	0.00017 U	0.00017 U	0.00018 U
Isopropylbenzene	mg/Kg			0.00016 U	0.00013 U	0.00011 U	0.00015 U	0.00010 U	0.00012 U	0.00014 U	0.00012 U	0.00012 U	0.00015 U	0.00012 U	0.00012 U	0.00016 U	0.00013 U	0.00012 U	0.00015 U	0.00013 U	0.00012 U	0.00012 U	0.00012 U
Methyl acetate	mg/Kg			0.0053 U	0.0043 U	0.0038 U	0.0051 U	0.0035 U	0.0039 U	0.0049 U	0.0042 U	0.0040 U	0.0053 U	0.0042 U	0.0040 U	0.0054 U	0.0043 U	0.0042 U	0.0050 U	0.0043 U	0.0041 U	0.0040 U	0.0042 U
Methyl tert-butyl ether	mg/Kg	0.93	100	**0.0031**	**0.00056 J**	**0.0012**	0.00015 U	0.00010 U *	0.00011 U *	0.00014 U	0.00012 U *	0.00011 U *	0.00015 U	0.00012 U *	0.00012 U *	0.00016 U	0.00012 U	0.00012 U *	0.00014 U *	0.00012 U *	0.00012 U	0.00012 U	0.00012 U
Methylcyclohexane	mg/Kg			0.00020 U	0.00016 U	0.00014 U	0.00019 U	0.00013 U	0.00015 U	0.00018 U	0.00016 U	0.00015 U	0.00020 U	0.00016 U	0.00015 U	0.00020 U	0.00016 U	0.00016 U	0.00018 U	0.00016 U	0.00015 U	0.00015 U	0.00016 U
Methylene Chloride	mg/Kg	0.05	100	0.00020 U	0.00016 U	0.00014 U	0.00019 U	**0.00019 J**	**0.00032 J**	**0.00049 J**	**0.00079 J**	**0.00046 J**	**0.00047 J**	**0.00097 J**	**0.00065 J**	**0.00035 J**	**0.00048 J**	**0.00051 J**	**0.00063 J**	**0.00043 J**	**0.00041 J**	**0.00061 J**	**0.00051 J**
m-Xylene & p-Xylene	mg/Kg	0.26	100	0.00021 U	0.00017 U	**0.00033 J**	0.00021 U	0.00014 U	0.00016 U	0.00020 U	0.00017 U	0.00016 U	0.00021 U	0.00017 U	0.00016 U	0.00022 U	0.00017 U	0.00017 U	0.00020 U	0.00017 U	0.00016 U	0.00016 U	0.00017 U
o-Xylene	mg/Kg	0.26	100	0.00012 U	0.000095 U	**0.000085 J**	0.00011 U	0.000078 U	0.000087 U	0.00011 U	0.000094 U	0.000087 U	0.00012 U	0.000093 U	0.000089 U	0.00012 U	0.000094 U	0.000093 U	0.00011 U	0.000095 U	0.000090 U	0.000089 U	0.000093 U
Styrene	mg/Kg			0.00015 U	0.00012 U	0.00011 U	0.00015 U	0.00010 U	0.00011 U	0.00014 U	0.00012 U	0.00011 U	0.00015 U	0.00012 U	0.00011 U	0.00016 U	0.00012 U	0.00012 U	0.00014 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U
Tetrachloroethene	mg/Kg	1.3	19	**0.00097 J**	0.00014 U	0.00013 U	**0.00069 J**	0.00012 U	0.00013 U	**0.0014**	0.00014 U	0.00013 U	**0.0011 J**	0.00014 U	0.00013 U	0.00018 U	0.00014 U	0.00014 U	**0.00021 J**	0.00014 U	0.00013 U	0.00014 U	
Toluene	mg/Kg	0.7	100	0.00077 U	0.00063 U	**0.00066 J**	0.00074 U	0.00051 U	0.00057 U	0.00071 U	0.00062 U	0.00057 U	0.00076 U	0.00061 U	0.00058 U	0.00079 U	0.00062 U	0.00061 U	0.00072 U	0.00062 U	0.00059 U	0.00059 U	0.00061 U
trans-1,2-Dichloroethene	mg/Kg	0.19	100	0.00030 U	0.00025 U	0.00022 U	0.00029 U	0.00020 U	0.00023 U	0.00028 U	0.00024 U	0.00023 U	0.00030 U	0.00024 U	0.00023 U	0.00031 U	0.00024 U	0.00024 U	0.00028 U	0.00025 U	0.00023 U	0.00023 U	0.00024 U
trans-1,3-Dichloropropene	mg/Kg			0.00033 U	0.00027 U	0.00023 U	0.00032 U	0.00022 U	0.00024 U	0.00030 U	0.00026 U	0.00024 U	0.00032 U	0.00026 U	0.00025 U	0.00034 U	0.00026 U	0.00026 U	0.00031 U	0.00027 U	0.00025 U	0.00025 U	0.00026 U
Trichloroethene	mg/Kg	0.47	21	0.00018 U	0.00014 U	0.00013 U	**0.0013**	0.00012 U	0.00013 U	**0.0040**	0.00014 U	0.00013 U	**0.0030**	0.00014 U	**0.00021 J**	**0.00067 J**	0.00014 U	0.00014 U	**0.0024**	**0.00035 J**	**0.00081 J**	0.00014 U	0.00014 U
Trichlorofluoromethane	mg/Kg			0.00050 U	0.00041 U	0.00036 U	0.00048 U	0.00033 U	0.00037 U	0.00046 U	0.00040 U	0.00037 U	0.00050 U	0.00040 U	0.00038 U	0.00051 U	0.00040 U	0.00040 U	0.00047 U	0.00041 U	0.00038 U	0.00038 U	0.00040 U
Vinyl chloride	mg/Kg	0.02	0.9	0.00067 U	0.00055 U	0.00048 U	0.00065 U	0.00045 U	0.00050 U	0.00062 U	0.00054 U	0.00050 U	0.00067 U	0.00054 U	0.00051 U	0.00069 U	0.00054 U	0.00053 U	0.00063 U	0.00055 U	0.00052 U	0.00051 U	0.00053 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approxima

U : Indicates the analyte was analyzed for but not detected.

Table 1A
Summary of Soil Sampling Results
Volatile Organic Compounds (8260)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-7 S-21 (3-3.5) 5/8/2019 8:40 AM	460-181467-8 S-21 (8-8.5) 5/8/2019 8:45 AM	460-181467-9 S-21 (14-14.5) 5/8/2019 8:55 AM	460-181467-16 S-22 (1.5-2) 5/8/2019 10:00 AM	460-181467-17 S-22 (5.5-6) 5/8/2019 10:05 AM	460-181467-18 S-22 (10.5-11) 5/8/2019 10:10 AM	460-181467-4 S-23 (4-4.5) 5/8/2019 8:15 AM	460-181467-5 S-23 (9-9.5) 5/8/2019 8:20 AM	460-181467-6 S-23 (13.5-14) 5/8/2019 8:30 AM	460-181391-29 S-24 (4.5-5) 5/7/2019 12:50 PM	460-181391-4 S-24(9 -9.5) 5/7/2019 1:00 PM	460-181391-35 S-24 (14.5-15) 5/7/2019 1:05 PM	460-181467-1 S-25 (2.5-3) 5/8/2019 7:45 AM	460-181467-2 S-25 (6.5-7) 5/8/2019 8:00 AM	460-181467-3 S-25 (12-12.5) 5/8/2019 8:10 AM	460-181391-11 S-26 (3-3.5) 5/7/2019 1:25 PM	460-181391-20 S-26 (8-8.5) 5/7/2019 1:36 PM	460-181391-37 S-26 (13-13.5) 5/7/2019 1:35 PM	460-181391-12 S-26 (18.5-19) 5/7/2019 1:50 PM	460-181391-13 S-26 (22.5-23) 5/7/2019 2:00 PM
SOIL BY 8260C																							
1,1,1-Trichloroethane	mg/Kg	0.68	100	0.00024 U	0.00021 U	0.00018 U	0.00024 U	0.00018 U	0.00020 U	0.00018 U	0.00019 U	0.00024 U	0.00022 U	0.00024 U	0.00028 U	**0.00045 J**	0.00023 U	0.00020 U	0.00024 U	0.00023 U	0.00025 U	0.00027 U	0.00024 U
1,1,2,2-Tetrachloroethane	mg/Kg			0.00022 U	0.00020 U	0.00017 U	0.00022 U	0.00017 U	0.00018 U	0.00017 U	0.00018 U	0.00022 U	0.00020 U	0.00022 U	0.00026 U	0.00019 U	0.00021 U	0.00018 U	0.00022 U	0.00021 U	0.00023 U	0.00024 U	0.00022 U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg			0.00031 U	0.00028 U	0.00023 U	0.00031 U	0.00024 U	0.00025 U	0.00024 U	0.00025 U	0.00031 U	0.00029 U	0.00031 U	0.00036 U	0.00027 U	0.00030 U	0.00025 U	0.00032 U	0.00030 U	0.00032 U	0.00034 U	0.00031 U
1,1,2-Trichloroethane	mg/Kg			0.00019 U	0.00016 U	0.00014 U	**0.0014**	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00018 U	0.00017 U	0.00018 U	0.00021 U	**0.00059 J**	**0.00040 J**	**0.00044 J**	0.00019 U	0.00018 U	0.00019 U	0.00020 U	0.00019 U
1,1-Dichloroethane	mg/Kg	0.27	26	0.00022 U	0.00019 U	0.00016 U	0.00021 U	0.00016 U	0.00017 U	0.00016 U	0.00017 U	0.00021 U	0.00020 U	0.00021 U	0.00025 U	0.00018 U	0.00020 U	0.00017 U	0.00022 U	0.00020 U	0.00022 U	0.00024 U	0.00021 U
1,1-Dichloroethene	mg/Kg	0.33	100	0.00023 U	0.00021 U	0.00017 U	0.00023 U	0.00018 U	0.00019 U	0.00018 U	0.00019 U	0.00023 U	0.00022 U	0.00023 U	0.00027 U	0.00020 U	0.00022 U	0.00019 U	0.00024 U	0.00022 U	0.00024 U	0.00026 U	0.00023 U
1,2,3-Trichlorobenzene	mg/Kg			0.00019 U	0.00017 U	0.00014 U	0.00019 U	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00019 U	0.00017 U	0.00019 U	0.00022 U	0.00016 U	0.00018 U	0.00015 U	0.00019 U	0.00018 U	0.00019 U	0.00021 U	0.00019 U
1,2,4-Trichlorobenzene	mg/Kg			0.000096 U	0.000084 U	0.000071 U	0.000094 U	0.000073 U	0.000077 U	0.000072 U	0.000077 U	0.000096 U	0.000088 U	0.000096 U	0.00011 U	0.000082 U	0.000090 U	0.000077 U	0.000096 U	0.000091 U	0.000099 U	0.00011 U	0.000096 U
1,2-Dibromo-3-Chloropropane	mg/Kg			0.00048 U	0.00042 U	0.00035 U	0.00047 U	0.00036 U	0.00039 U	0.00036 U	0.00038 U	0.00048 U	0.00044 U	0.00048 U	0.00055 U	0.00041 U	0.00045 U	0.00039 U	0.00048 U	0.00046 U	0.00049 U	0.00053 U	0.00048 U
1,2-Dichlorobenzene	mg/Kg	1.1	100	0.00015 U	0.00013 U	0.00011 U	0.00015 U	0.00011 U	0.00012 U	0.00011 U	0.00012 U	0.00015 U	0.00014 U	0.00015 U	0.00017 U	0.00013 U	0.00014 U	0.00012 U	0.00015 U	0.00014 U	0.00015 U	0.00016 U	0.00015 U
1,2-Dichloroethane	mg/Kg	0.02	3.1	0.00031 U	0.00027 U	0.00023 U	0.00030 U	0.00023 U	0.00025 U	0.00023 U	0.00025 U	0.00031 U	0.00028 U	0.00031 U	**0.00041 J**	0.00026 U	0.00029 U	0.00025 U	0.00031 U	0.00029 U	0.00032 U	0.00034 U	0.00031 U
1,2-Dichloropropane	mg/Kg			0.00044 U	0.00039 U	0.00033 U	0.00043 U	0.00033 U	0.00036 U	0.00033 U	0.00035 U	0.00044 U	0.00040 U	0.00044 U	0.00050 U	0.00038 U	0.00042 U	0.00035 U	0.00044 U	0.00042 U	0.00045 U	0.00048 U	0.00044 U
1,3-Dichlorobenzene	mg/Kg	2.4	49	0.00017 U	0.00015 U	0.00012 U	0.00016 U	0.00013 U	0.00013 U	0.00012 U	0.00013 U	0.00017 U	0.00015 U	0.00017 U	0.00019 U	0.00014 U	0.00016 U	0.00013 U	0.00017 U	0.00016 U	0.00017 U	0.00018 U	0.00017 U
1,4-Dichlorobenzene	mg/Kg	1.8	13	0.00010 U	0.000091 U	0.000077 U	0.00010 U	0.000079 U	0.000084 U	0.000078 U	0.000084 U	0.00010 U	0.000096 U	0.00010 U	0.00012 U	0.000089 U	0.000098 U	0.000084 U	0.00010 U	0.000099 U	0.00011 U	0.00011 U	0.00010 U
2-Butanone (MEK)	mg/Kg	0.12	100	0.0012 U	0.0010 U	0.00086 U	0.0011 U	0.00088 U	0.00093 U	0.00087 U	0.00093 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U	0.00099 U	0.0011 U	0.00093 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U	0.0012 U
2-Hexanone	mg/Kg			0.00081 U	0.00071 U	0.00060 U	0.00080 U	0.00062 U	0.00066 U	0.00061 U	0.00065 U	0.00081 U	0.00075 U	0.00081 U	0.00093 U	0.00070 U	0.00077 U	0.00065 U	0.00082 U	0.00077 U	0.00084 U	0.00089 U	0.00081 U
4-Methyl-2-pentanone (MIBK)	mg/Kg			0.00069 U	0.00061 U	0.00051 U	0.00068 U	0.00052 U	0.00056 U	0.00052 U	0.00055 U	0.00069 U	0.00063 U	0.00069 U	0.00079 U	0.00059 U	0.00065 U	0.00056 U	0.00070 U	0.00066 U	0.00071 U	0.00076 U	0.00069 U
Acetone	mg/Kg	0.05	100	0.0040 U	**0.0039 J**	**0.0033 J**	0.0039 U	**0.0042**	0.0032 U	0.0030 U	**0.0036 J**	**0.0047 J**	**0.0037 J**	**0.0045 J**	**0.0064**	0.0034 U	0.0037 U	0.0032 U	0.0040 U	0.0038 U	**0.0042 J**	**0.018**	0.0040 U
Benzene	mg/Kg	0.06	4.8	0.00027 U	0.00024 U	0.00020 U	0.00026 U	0.00020 U	0.00022 U	0.00020 U	0.00022 U	0.00027 U	0.00025 U	0.00027 U	0.00031 U	0.00023 U	0.00025 U	0.00022 U	0.00027 U	0.00026 U	0.00028 U	0.00029 U	0.00027 U
Bromoform	mg/Kg			0.00044 U	0.00039 U	0.00033 U	0.00043 U	0.00034 U	0.00036 U	0.00033 U	0.00036 U	0.00044 U	0.00041 U	0.00044 U	0.00051 U	0.00038 U	0.00042 U	0.00036 U	0.00045 U	0.00042 U	0.00046 U	0.00049 U	0.00044 U
Bromomethane	mg/Kg			0.00050 U	0.00043 U	0.00037 U	0.00048 U	0.00037 U	0.00040 U	0.00037 U	0.00040 U	0.00049 U	0.00045 U	0.00049 U	0.00057 U	0.00042 U	0.00047 U	0.00040 U	0.00050 U	0.00047 U	0.00051 U	0.00054 U	0.00049 U
Carbon disulfide	mg/Kg			0.00028 U	0.00024 U	0.00021 U	0.00027 U	0.00021 U	0.00022 U	0.00021 U	0.00022 U	0.00028 U	0.00025 U	0.00028 U	0.00032 U	0.00024 U	0.00026 U	0.00022 U	0.00028 U	0.00026 U	0.00029 U	0.00030 U	0.00028 U
Carbon tetrachloride	mg/Kg	0.76	2.4	**0.00076 J**	0.00017 U	**0.00071 J**	**0.00072 J**	0.00014 U	0.00015 U	**0.00020 J**	**0.00031 J**	**0.00071 J**	**0.00038 J B**	**0.00067 J B**	**0.0014 B**	**0.00099**	0.00018 U	**0.00066 J**	**0.00057 J B**	**0.0012 B**	0.00019 U	**0.00042 J B**	**0.00029 J B**
Chlorobenzene	mg/Kg	1.1	100	0.00018 U	0.00016 U	0.00014 U	0.00018 U	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00018 U	0.00017 U	0.00018 U	0.00021 U	0.00016 U	0.00017 U	0.00015 U	0.00019 U	0.00018 U	0.00019 U	0.00020 U	0.00018 U
Chlorobromomethane	mg/Kg			0.00029 U	0.00026 U	0.00022 U	0.00029 U	0.00022 U	0.00024 U	0.00022 U	0.00023 U	0.00029 U	0.00027 U	0.00029 U	0.00033 U	0.00025 U	0.00028 U	0.00024 U	0.00029 U	0.00028 U	0.00030 U	0.00032 U	0.00029 U
Chlorodibromomethane	mg/Kg			0.00020 U	0.00018 U	0.00015 U	0.00020 U	0.00015 U	0.00016 U	0.00015 U	0.00016 U	0.00020 U	0.00019 U	0.00020 U	0.00023 U	0.00017 U	0.00019 U	0.00016 U	0.00020 U	0.00019 U	0.00021 U	0.00022 U	0.00020 U
Chloroethane	mg/Kg			0.00055 U	0.00048 U	0.00040 U	0.00053 U	0.00041 U	0.00044 U	0.00041 U	0.00044 U	0.00054 U	0.00050 U	0.00054 U	0.00062 U	0.00047 U	0.00051 U	0.00044 U	0.00055 U	0.00052 U	0.00056 U	0.00060 U	0.00054 U
Chloroform	mg/Kg	0.37	49	0.00033 U	0.00029 U	0.00025 U	0.00033 U	0.00025 U	0.00027 U	0.00025 U	0.00027 U	0.00033 U	0.00030 U	0.00033 U	0.00038 U	0.00029 U	0.00031 U	0.00027 U	0.00033 U	0.00032 U	0.00034 U	0.00036 U	0.00033 U
Chloromethane	mg/Kg			0.00045 U	0.00040 U	0.00034 U	0.00044 U	0.00034 U	0.00037 U	0.00034 U	0.00036 U	0.00045 U	0.00042 U	0.00045 U	0.00052 U	0.00039 U	0.00043 U	0.00036 U	0.00046 U	0.00043 U	0.00047 U	0.00050 U	0.00045 U
cis-1,2-Dichloroethene	mg/Kg	0.25	100	0.00016 U	0.00014 U	0.00012 U	0.00016 U	0.00012 U	0.00013 U	0.00012 U	0.00013 U	0.00016 U	0.00015 U	0.00016 U	0.00018 U	0.00014 U	0.00015 U	0.00013 U	0.00016 U	0.00015 U	0.00016 U	0.00017 U	0.00016 U
cis-1,3-Dichloropropene	mg/Kg			0.00029 U	0.00025 U	0.00021 U	0.00028 U	0.00022 U	0.00023 U	0.00021 U	0.00023 U	0.00028 U	0.00026 U	0.00028 U	0.00033 U	0.00024 U	0.00027 U	0.00023 U	0.00029 U	0.00027 U	0.00029 U	0.00031 U	0.00028 U
Cyclohexane	mg/Kg			0.00023 U	0.00020 U	0.00017 U	0.00023 U	0.00017 U	0.00019 U	0.00017 U	0.00018 U	0.00023 U	0.00021 U	0.00023 U	0.00026 U	0.00020 U	0.00022 U	0.00019 U	0.00023 U	0.00022 U	0.00024 U	0.00025 U	0.00023 U
Dichlorobromomethane	mg/Kg			0.00027 U	0.00023 U	0.00020 U	0.00026 U	0.00020 U	0.00022 U	0.00020 U	0.00021 U	0.00027 U	0.00025 U	0.00027 U	0.00031 U	0.00023 U	0.00025 U	0.00022 U	0.00027 U	0.00025 U	0.00028 U	0.00029 U	0.00027 U
Dichlorodifluoromethane	mg/Kg			0.00035 U *	0.00031 U *	0.00026 U *	0.00035 U	0.00027 U	0.00028 U	0.00026 U *	0.00028 U *	0.00035 U *	0.00032 U	0.00035 U	0.00040 U	0.00030 U *	0.00033 U *	0.00028 U *	0.00035 U	0.00033 U	0.00036 U	0.00039 U	0.00035 U
Ethylbenzene	mg/Kg	1	41	0.00021 U	0.00018 U	0.00015 U	0.00020 U	0.00016 U	0.00017 U	0.00016 U	0.00017 U	0.00021 U	0.00019 U	0.00021 U	0.00024 U	0.00018 U	0.00020 U	0.00017 U	0.00021 U	0.00020 U	0.00021 U	0.00023 U	0.00021 U
Ethylene Dibromide	mg/Kg			0.00019 U	0.00016 U	0.00014 U	0.00018 U	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00019 U	0.00017 U	0.00019 U	0.00021 U	0.00016 U	0.00018 U	0.00015 U	0.00019 U	0.00018 U	0.00019 U	0.00021 U	0.00019 U
Isopropylbenzene	mg/Kg			0.00013 U	0.00012 U	0.000097 U	0.00013 U	0.000099 U	0.00011 U	0.000099 U	0.00011 U	0.00013 U	0.00012 U	0.00013 U	0.00015 U	0.00011 U	0.00012 U	0.00011 U	0.00013 U	0.00012 U	0.00014 U	0.00014 U	0.00013 U
Methyl acetate	mg/Kg			0.0045 U	0.0039 U	0.0033 U	0.0044 U	0.0034 U	0.0036 U	0.0034 U	0.0036 U	0.0045 U	0.0041 U	0.0045 U	0.0051 U	0.0038 U	0.0042 U	0.0036 U	0.0045 U	0.0043 U	0.0046 U	0.0049 U	0.0045 U
Methyl tert-butyl ether	mg/Kg	0.93	100	0.00013 U	0.00011 U	0.000096 U	0.00013 U	0.000099 U	0.00011 U	0.000098 U	0.00010 U	0.00013 U	0.00012 U	0.00013 U *	0.00015 U	0.00011 U	0.00012 U	0.00010 U	0.00013 U *	0.00012 U	0.00013 U	0.00014 U *	0.00013 U *
Methylcyclohexane	mg/Kg			0.00017 U	0.00015 U	0.00012 U	0.00016 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00017 U	0.00015 U	0.00017 U	0.00019 U	0.00014 U	0.00016 U	0.00013 U	0.00017 U	0.00016 U	0.00017 U	0.00018 U	0.00017 U
Methylene Chloride	mg/Kg	0.05	100	0.00017 U	0.00015 U	0.00013 U	**0.00034 J**	**0.00029 J**	**0.00031 J**	**0.00042 J**	**0.00035 J**	0.00017 U	**0.00074 J**	**0.00085 J**	**0.00039 J**	**0.0096**	**0.00026 J**	**0.00019 J**	**0.00060 J**	0.00016 U	**0.00058 J**	**0.00035 J**	**0.00017 J**
m-Xylene & p-Xylene	mg/Kg	0.26	100	0.00018 U	0.00016 U	0.00013 U	0.00018 U	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00018 U	0.00017 U	0.00018 U	0.00021 U	0.00016 U	0.00017 U	0.00015 U	0.00018 U	**0.00020 J**	0.00019 U	**0.00025 J**	0.00018 U
o-Xylene	mg/Kg	0.26	100	0.000099 U	0.000087 U	0.000073 U	0.000097 U	0.000075 U	0.000080 U	0.000074 U	0.000079 U	0.000099 U	0.000091 U	0.000099 U	0.00011 U	0.000085 U	0.000093 U	0.000080 U	0.00010 U	0.000094 U	0.00010 U	0.00011 U	0.000099 U
Styrene	mg/Kg			0.00013 U	0.00011 U	0.000095 U	0.00013 U	0.000097 U	0.00010 U	0.000096 U	0.00010 U	0.00013 U	0.00012 U	0.00013 U	0.00015 U	0.00011 U	0.00012 U	0.00010 U	0.00013 U	0.00012 U	0.00013 U	0.00014 U	0.00013 U
Tetrachloroethene	mg/Kg	1.3	19	0.00015 U	0.00013 U	0.00011 U	**0.0015**	0.00011 U	0.00012 U	0.00011 U	0.00012 U	0.00015 U	0.00014 U	0.00015 U	0.00017 U	**0.0013**	**0.00035 J**	**0.00021 J**	0.00015 U	0.00014 U	0.00015 U	0.00016 U	0.00015 U
Toluene	mg/Kg	0.7	100	0.00065 U	0.00057 U	0.00048 U	0.00064 U	0.00049 U	0.00053 U	0.00049 U	0.00052 U	0.00065 U	0.00060 U	0.00065 U	0.00075 U	0.00056 U	0.00061 U	0.00052 U	0.00065 U	0.00062 U	0.00067 U	0.00071 U	0.00065 U
trans-1,2-Dichloroethene	mg/Kg	0.19	100	0.00026 U	0.00022 U	0.00019 U	0.00025 U	0.00019 U	0.00021 U	0.00019 U	0.00021 U	0.00026 U	0.00024 U	0.00026 U	0.00029 U	0.00022 U	0.00024 U	0.00021 U	0.00026 U	0.00024 U	0.00026 U	0.00028 U	0.00026 U
trans-1,3-Dichloropropene	mg/Kg			0.00028 U	0.00024 U	0.00021 U	0.00027 U	0.00021 U	0.00022 U	0.00021 U	0.00022 U	0.00028 U	0.00025 U	0.00028 U	0.00032 U	0.00024 U	0.00026 U	0.00022 U	0.00028 U	0.00026 U	0.00029 U	0.00030 U	0.00028 U
Trichloroethene	mg/Kg	0.47	21	**0.00026 J**	0.00013 U	0.00011 U	**0.00051 J**	0.00011 U	0.00012 U	0.00011 U	0.00012 U	0.00015 U	0.00014 U	0.00015 U	0.00017 U	**0.00026 J**	0.00014 U	0.00012 U	0.00015 U	0.00014 U	0.00015 U	0.00016 U	0.00015 U
Trichlorofluoromethane	mg/Kg			0.00042 U	0.00037 U	0.00031 U	0.00042 U	0.00032 U	0.00034 U	0.00032 U	0.00034 U	0.00042 U	0.00039 U	0.00042 U	0.00048 U	0.00036 U	0.00040 U	0.00034 U	0.00043 U	0.00040 U	0.00044 U	0.00046 U	0.00042 U
Vinyl chloride	mg/Kg	0.02	0.9	0.00057 U	0.00050 U	0.00042 U	0.00056 U	0.00043 U	0.00046 U	0.00043 U	0.00046 U	0.00057 U	0.00052 U	0.00057 U	0.00065 U	0.00049 U	0.00054 U	0.00046 U	0.00057 U	0.00054 U	0.00059 U	0.00062 U	0.00057 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approxima

U : Indicates the analyte was analyzed for but not detected.

Table 1A
Summary of Soil Sampling Results
Volatile Organic Compounds (8260)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-192138-1 SB-27i (12-14) 9/23/2019 1:45 PM	460-192138-2 SB-27ii (15-17) 9/23/2019 2:05 PM	460-192138-3 SB-27iii (18-20) 9/23/2019 2:20 PM	460-192138-4 SB-28i (12-14) 9/23/2019 2:45 PM	460-192138-5 SB-28ii (15-17) 9/23/2019 3:05 PM	460-192138-6 SB-28iii (18-20) 9/23/2019 3:20 PM	460-192461-1 SB-29i(12-14) 9/26/2019 3:20 PM	460-192461-2 SB-29ii(15-17) 9/26/2019 3:35 PM	460-192461-3 SB-29iii(18-20) 9/26/2019 3:55 PM	460-192461-4 SB-30i(2-3) 9/26/2019 4:45 PM	460-192461-5 SB-30ii(8-9) 9/26/2019 5:00 PM	460-192461-6 SB-30iii(11-12) 9/26/2019 5:15 PM	460-192461-7 SB-30iv(17-18) 9/26/2019 5:30 PM	460-192460-1 SB-31(2.5-3) 9/27/2019 8:30 AM	460-192460-2 SB-31(7.5-8) 9/27/2019 8:35 AM	460-192460-3 SB-31(12.5-13) 9/27/2019 8:40 AM	460-192460-4 SB-31(18-18.5) 9/27/2019 8:45 AM
SOIL BY 8260C																					
1,1,1-Trichloroethane	mg/Kg	0.68	100	0.00021 U	0.00019 U	0.00023 U	0.00020 U	0.00022 U	0.00021 U	0.00022 U	0.00024 U	0.00021 U	0.00023 U	0.00020 U	0.00023 U	0.00020 U	0.00021 U	0.00020 U	0.00019 U	0.00019 U
1,1,2,2-Tetrachloroethane	mg/Kg			0.00019 U	0.00018 U	0.00021 U	0.00018 U	0.00020 U	0.00019 U	0.00020 U	0.00022 U	0.00020 U	0.00021 U	0.00018 U	0.00021 U	0.00019 U	0.00019 U	0.00018 U	0.00018 U	0.00017 U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg			0.00027 U	0.00025 U	0.00029 U	0.00025 U	0.00028 U	0.00027 U	0.00028 U	0.00030 U	0.00027 U	0.00030 U	0.00025 U	0.00030 U	0.00026 U	0.00027 U	0.00025 U	0.00025 U	0.00024 U
1,1,2-Trichloroethane	mg/Kg			0.00016 U	0.00015 U	0.00017 U	0.00015 U	0.00017 U	0.00016 U	0.00017 U	0.00018 U	0.00016 U	0.00018 U	0.00015 U	0.00018 U	0.00016 U	0.00016 U	0.00015 U	0.00015 U	0.00014 U
1,1-Dichloroethane	mg/Kg	0.27	26	0.00019 U	0.00017 U	0.00020 U	0.00017 U	0.00019 U	0.00018 U	0.00019 U	0.00021 U	0.00019 U	0.00020 U	0.00017 U	0.00020 U	0.00018 U	0.00019 U	0.00017 U	0.00017 U	0.00017 U
1,1-Dichloroethene	mg/Kg	0.33	100	0.00020 U	0.00018 U	0.00022 U	0.00019 U	0.00021 U	0.00020 U	0.00021 U	0.00023 U	0.00021 U	0.00022 U	0.00019 U	0.00022 U	0.00020 U	0.00020 U	0.00019 U	0.00019 U	0.00018 U
1,2,3-Trichlorobenzene	mg/Kg			0.00016 U	0.00015 U	0.00018 U	0.00015 U	0.00017 U	0.00016 U	0.00017 U	0.00018 U	0.00017 U	0.00018 U	0.00015 U	0.00018 U	0.00016 U	0.00016 U	0.00015 U	0.00015 U	0.00015 U
1,2,4-Trichlorobenzene	mg/Kg			0.00032 U	0.00029 U	0.00035 U	0.00030 U	0.00034 U	0.00032 U	0.00033 U	0.00036 U	0.00033 U	0.00036 U	0.00030 U	0.00035 U	0.00031 U	0.00032 U	0.00030 U	0.00029 U	0.00029 U
1,2-Dibromo-3-Chloropropane	mg/Kg			0.00041 U	0.00038 U	0.00045 U	0.00039 U	0.00043 U	0.00041 U	0.00043 U	0.00047 U	0.00042 U	0.00046 U	0.00039 U	0.00046 U	0.00040 U	0.00042 U	0.00039 U	0.00038 U	0.00037 U
1,2-Dichlorobenzene	mg/Kg	1.1	100	0.00013 U	0.00012 U	0.00014 U	0.00012 U	0.00014 U	0.00013 U	0.00013 U	0.00015 U	0.00013 U	0.00014 U	0.00012 U	0.00014 U	0.00013 U	0.00013 U	0.00012 U	0.00012 U	0.00012 U
1,2-Dichloroethane	mg/Kg	0.02	3.1	0.00027 U	0.00024 U	0.00029 U	0.00025 U	0.00028 U	0.00026 U	0.00028 U	0.00030 U	0.00027 U	0.00029 U	0.00025 U	0.00029 U	0.00026 U	0.00027 U	0.00025 U	0.00024 U	0.00024 U
1,2-Dichloropropane	mg/Kg			0.00038 U	0.00035 U	0.00041 U	0.00036 U	0.00040 U	0.00038 U	0.00040 U	0.00043 U	0.00039 U	0.00042 U	0.00035 U	0.00042 U	0.00037 U	0.00038 U	0.00036 U	0.00035 U	0.00034 U
1,3-Dichlorobenzene	mg/Kg	2.4	49	0.00014 U	0.00013 U	0.00016 U	0.00013 U	0.00015 U	0.00014 U	0.00015 U	0.00016 U	0.00015 U	0.00016 U	0.00013 U	0.00016 U	0.00014 U	0.00014 U	0.00013 U	0.00013 U	0.00013 U
1,4-Dichlorobenzene	mg/Kg	1.8	13	0.00020 U	0.00018 U	0.00022 U	0.00019 U	0.00021 U	0.00020 U	0.00021 U	0.00023 U	0.00021 U	0.00022 U	0.00019 U	0.00022 U	0.00020 U	0.00020 U	0.00019 U	0.00019 U	0.00018 U
2-Butanone (MEK)	mg/Kg	0.12	100	0.0024 U	0.0022 U	0.0026 U	0.0023 U	0.0026 U	0.0024 U	0.0025 U	0.0027 U	0.0025 U	0.0027 U	0.0023 U	0.0027 U	0.0024 U	**0.0025 J**	0.0023 U	0.0022 U	0.0022 U
2-Hexanone	mg/Kg			0.0015 U	0.0014 U	0.0017 U	0.0014 U	0.0016 U	0.0015 U	0.0016 U	0.0017 U	0.0016 U	0.0017 U	0.0014 U	0.0017 U	0.0015 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U
4-Methyl-2-pentanone (MIBK)	mg/Kg			0.0014 U	0.0013 U	0.0015 U	0.0013 U	0.0015 U	0.0014 U	0.0015 U	0.0016 U	0.0014 U	0.0015 U	0.0013 U	0.0015 U	0.0014 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U
Acetone	mg/Kg	0.05	100	0.0051 U	**0.013**	0.0056 U	0.0048 U	0.0054 U	**0.0080**	0.0053 U *	**0.014** *	0.0052 U *	0.0057 U *	0.0048 U *	**0.020** *	0.0050 U	**0.013**	0.0048 U	**0.0049**	**0.0049**
Benzene	mg/Kg	0.06	4.8	0.00023 U	0.00021 U	0.00025 U	0.00022 U	0.00024 U	0.00023 U	0.00024 U	0.00026 U	0.00024 U	0.00026 U	0.00022 U	0.00026 U	0.00023 U	0.00023 U	0.00022 U	0.00021 U	0.00021 U
Bromoform	mg/Kg			0.00038 U	0.00035 U	0.00041 U	0.00036 U	0.00040 U	0.00038 U	0.00040 U	0.00043 U	0.00039 U	0.00042 U	0.00036 U	0.00042 U	0.00037 U	0.00038 U	0.00036 U	0.00035 U	0.00035 U
Bromomethane	mg/Kg			0.00043 U	0.00039 U	0.00046 U	0.00040 U	0.00045 U	0.00042 U	0.00044 U	0.00048 U	0.00043 U	0.00047 U	0.00040 U	0.00047 U	0.00042 U	0.00043 U	0.00040 U	0.00039 U	0.00039 U
Carbon disulfide	mg/Kg			0.00024 U	**0.00040 J**	0.00026 U	0.00022 U	0.00025 U	**0.00065 J**	0.00025 U	0.00027 U	0.00024 U	0.00026 U	0.00022 U	0.00026 U	0.00023 U	0.00024 U	0.00022 U	0.00022 U	0.00022 U
Carbon tetrachloride	mg/Kg	0.76	2.4	0.00035 U	0.00032 U	0.00038 U	0.00033 U	0.00036 U	0.00035 U	0.00036 U	0.00039 U	0.00035 U	0.00038 U	0.00032 U	0.00038 U	0.00034 U	0.00035 U	0.00033 U	0.00032 U	0.00031 U
Chlorobenzene	mg/Kg	1.1	100	0.00016 U	0.00014 U	0.00017 U	0.00015 U	0.00017 U	0.00016 U	0.00017 U	0.00018 U	0.00016 U	0.00018 U	0.00015 U	0.00018 U	0.00015 U	0.00016 U	0.00015 U	0.00015 U	0.00014 U
Chlorobromomethane	mg/Kg			0.00025 U	0.00023 U	0.00027 U	0.00024 U	0.00026 U	0.00025 U	0.00026 U	0.00028 U	0.00026 U	0.00028 U	0.00024 U	0.00028 U	0.00025 U	0.00025 U	0.00024 U	0.00023 U	0.00023 U
Chlorodibromomethane	mg/Kg			0.00017 U	0.00016 U	0.00019 U	0.00016 U	0.00018 U	0.00017 U	0.00018 U	0.00020 U	0.00018 U	0.00019 U	0.00016 U	0.00019 U	0.00017 U	0.00018 U	0.00016 U	0.00016 U	0.00016 U
Chloroethane	mg/Kg			0.00047 U	0.00043 U	0.00051 U	0.00044 U	0.00049 U	0.00047 U	0.00049 U	0.00053 U	0.00048 U	0.00052 U	0.00044 U	0.00052 U	0.00046 U	0.00047 U	0.00044 U	0.00043 U	0.00042 U
Chloroform	mg/Kg	0.37	49	0.00029 U	0.00026 U	0.00031 U	0.00027 U	0.00030 U	0.00028 U	0.00030 U	0.00032 U	0.00029 U	0.00032 U	0.00027 U	0.00032 U	0.00028 U	0.00029 U	0.00027 U	0.00026 U	0.00026 U
Chloromethane	mg/Kg			0.00039 U	0.00036 U	0.00042 U	0.00037 U	0.00041 U	0.00039 U	0.00041 U	0.00044 U	0.00040 U	0.00043 U	0.00036 U	0.00043 U	0.00038 U	0.00039 U	0.00037 U	0.00036 U	0.00035 U
cis-1,2-Dichloroethene	mg/Kg	0.25	100	0.00014 U	0.00012 U	0.00015 U	0.00013 U	0.00014 U	0.00014 U	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00013 U	0.00015 U	0.00013 U	0.00014 U	0.00013 U	0.00013 U	0.00012 U
cis-1,3-Dichloropropene	mg/Kg			0.00025 U	0.00022 U	0.00027 U	0.00023 U	0.00026 U	0.00024 U	0.00025 U	0.00028 U	0.00025 U	0.00027 U	0.00023 U	0.00027 U	0.00024 U	0.00025 U	0.00023 U	0.00022 U	0.00022 U
Cyclohexane	mg/Kg			0.00020 U	0.00018 U	0.00022 U	0.00019 U	0.00021 U	0.00020 U	0.00021 U	0.00022 U	0.00020 U	0.00022 U	0.00019 U	0.00022 U	0.00019 U	0.00020 U	0.00019 U	0.00018 U	0.00018 U
Dichlorobromomethane	mg/Kg			0.00023 U	0.00021 U	0.00025 U	0.00022 U	0.00024 U	0.00023 U	0.00024 U	0.00026 U	0.00023 U	0.00026 U	0.00022 U	0.00025 U	0.00023 U	0.00023 U	0.00022 U	0.00021 U	0.00021 U
Dichlorodifluoromethane	mg/Kg			0.00030 U	0.00028 U	0.00033 U	0.00029 U	0.00032 U	0.00030 U	0.00032 U	0.00034 U	0.00031 U	0.00034 U	0.00028 U	0.00033 U	0.00030 U *	0.00031 U	0.00028 U	0.00028 U	0.00028 U
Ethylbenzene	mg/Kg	1	41	0.00018 U	0.00016 U	0.00019 U	0.00017 U	0.00019 U	0.00018 U	0.00019 U	0.00020 U	0.00018 U	0.00020 U	0.00017 U	0.00020 U	0.00017 U	0.00018 U	0.00017 U	0.00016 U	0.00016 U
Ethylene Dibromide	mg/Kg			0.00016 U	0.00015 U	0.00018 U	0.00015 U	0.00017 U	0.00016 U	0.00017 U	0.00018 U	0.00016 U	0.00018 U	0.00015 U	0.00018 U	0.00016 U	0.00016 U	0.00015 U	0.00015 U	0.00015 U
Isopropylbenzene	mg/Kg			0.00011 U	0.00010 U	0.00012 U	0.00011 U	0.00012 U	0.00011 U	0.00012 U	0.00013 U	0.00012 U	0.00013 U	0.00011 U	0.00012 U	0.00011 U	0.00011 U	0.00011 U	0.00010 U	0.00010 U
Methyl acetate	mg/Kg			0.0039 U	0.0035 U	0.0042 U	0.0036 U	0.0040 U	0.0038 U	0.0040 U *	0.0044 U *	0.0039 U *	0.0043 U *	0.0036 U *	0.0043 U *	0.0038 U	0.0039 U	0.0036 U	0.0035 U	0.0035 U
Methyl tert-butyl ether	mg/Kg	0.93	100	0.00011 U	0.00010 U	0.00012 U	0.00011 U	0.00012 U	0.00011 U	**0.00074 J**	0.00013 U	**0.0029**	0.00012 U	0.00010 U	0.00012 U	0.00011 U	0.00011 U	0.00011 U	0.00010 U	0.00010 U
Methylcyclohexane	mg/Kg			0.00045 U	0.00041 U	0.00049 U	0.00042 U	0.00047 U	0.00045 U	0.00047 U	0.00051 U	0.00046 U	0.00050 U	0.00042 U	0.00049 U	0.00044 U	0.00045 U	0.00042 U	0.00041 U	0.00041 U
Methylene Chloride	mg/Kg	0.05	100	0.00042 U	0.00038 U	0.00045 U	0.00039 U	0.00044 U	0.00041 U	0.00043 U	0.00047 U	0.00042 U	0.00046 U	0.00039 U	**0.0031**	0.00041 U	0.00042 U	0.00039 U	0.00038 U	0.00038 U
m-Xylene & p-Xylene	mg/Kg	0.26	100	0.00016 U	0.00014 U	0.00017 U	0.00015 U	0.00016 U	0.00016 U	0.00016 U	0.00018 U	0.00016 U	0.00017 U	0.00015 U	0.00017 U	0.00015 U	0.00016 U	0.00015 U	0.00014 U	0.00014 U
o-Xylene	mg/Kg	0.26	100	0.00017 U	0.00016 U	0.00019 U	0.00016 U	0.00018 U	0.00017 U	0.00018 U	0.00020 U	0.00018 U	0.00019 U	0.00016 U	0.00019 U	0.00017 U	0.00018 U	0.00016 U	0.00016 U	0.00016 U
Styrene	mg/Kg			0.00025 U	0.00023 U	0.00027 U	0.00023 U	0.00026 U	0.00025 U	0.00026 U	0.00028 U	0.00025 U	0.00028 U	0.00023 U	0.00028 U	0.00024 U	0.00025 U	0.00023 U	0.00023 U	0.00023 U
Tetrachloroethene	mg/Kg	1.3	19	0.00013 U	0.00012 U	0.00014 U	0.00012 U	0.00013 U	0.00013 U	0.00013 U	0.00014 U	0.00013 U	**0.00040 J**	0.00012 U	0.00014 U	0.00013 U	0.00013 U	0.00012 U	0.00012 U	0.00012 U
Toluene	mg/Kg	0.7	100	0.00021 U	0.00019 U	0.00023 U	0.00020 U	0.00022 U	0.00021 U	0.00022 U	0.00024 U	0.00021 U	0.00023 U	0.00020 U	0.00023 U	0.00020 U	0.00021 U	0.00020 U	0.00019 U	0.00019 U
trans-1,2-Dichloroethene	mg/Kg	0.19	100	0.00022 U	0.00020 U	0.00024 U	0.00021 U	0.00023 U	0.00022 U	0.00023 U	0.00025 U	0.00022 U	0.00024 U	0.00021 U	0.00024 U	0.00022 U	0.00022 U	0.00021 U	0.00020 U	0.00020 U
trans-1,3-Dichloropropene	mg/Kg			0.00024 U	0.00022 U	0.00026 U	0.00022 U	0.00025 U	0.00024 U	0.00025 U	0.00027 U	0.00024 U	0.00026 U	0.00022 U	0.00026 U	0.00023 U	0.00024 U	0.00022 U	0.00022 U	0.00022 U
Trichloroethene	mg/Kg	0.47	21	0.00013 U	**0.00017 J**	0.00014 U	0.00012 U	0.00014 U	0.00013 U	0.00013 U	0.00015 U	0.00013 U	0.00014 U	0.00012 U	0.00014 U	0.00013 U	0.00013 U	0.00012 U	0.00012 U	0.00012 U
Trichlorofluoromethane	mg/Kg			0.00037 U	0.00033 U	0.00040 U	0.00034 U	0.00038 U	0.00036 U	0.00038 U	0.00041 U	0.00037 U	0.00040 U	0.00034 U	0.00040 U	0.00036 U	0.00037 U	0.00034 U	0.00033 U	0.00033 U
Vinyl chloride	mg/Kg	0.02	0.9	0.00049 U	0.00045 U	0.00053 U	0.00046 U	0.00051 U	0.00049 U	0.00051 U	0.00055 U	0.00050 U	0.00054 U	0.00046 U	0.00054 U	0.00048 U	0.00049 U	0.00046 U	0.00045 U	0.00044 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approxima

U : Indicates the analyte was analyzed for but not detected.

Table 1A
Summary of Soil Sampling Results
Volatile Organic Compounds (8260)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-192460-5 SB-31(22.5-23) 9/27/2019 8:50 AM	460-192460-6 SB-31(27.5-28) 9/27/2019 8:55 AM	460-192460-7 SB-32(3-3.5) 9/27/2019 9:05 AM	460-192460-8 SB-32(7-7.5) 9/27/2019 9:10 AM	460-192460-9 SB-32(11-11.5) 9/27/2019 9:15 AM	460-192460-10 SB-32(16-16.5) 9/27/2019 9:20 AM	460-192460-11 SB-32(21.5-22) 9/27/2019 9:25 AM	460-192460-12 SB-33(3.5-4) 9/27/2019 10:10 AM	460-192460-13 SB-33(8.5-9) 9/27/2019 10:20 AM	460-192460-14 SB-33(13.5-14) 9/27/2019 10:35 AM	460-192460-15 SB-33(18.5-19) 9/27/2019 10:40 AM	460-192460-16 SB-33(23.5-24) 9/27/2019 10:45 AM	460-192460-17 SB-34(1.5-2) 9/27/2019 11:00 AM	460-192460-18 SB-34(6.5-7) 9/27/2019 11:05 AM	460-192460-19 SB-34(11.5-12) 9/27/2019 11:10 AM
SOIL BY 8260C																		
1,1,1-Trichloroethane	mg/Kg	0.68	100	0.00019 U	0.00019 U	0.00023 U	0.00019 U	0.00019 U	0.00019 U	0.00020 U	0.00019 U	0.00020 U	0.00019 U	0.00018 U	0.00019 U	0.00024 U	0.00021 U	0.00019 U
1,1,2,2-Tetrachloroethane	mg/Kg			0.00017 U	0.00018 U	0.00021 U	0.00017 U	0.00017 U	0.00018 U	0.00018 U	0.00017 U	0.00018 U	0.00017 U	0.00017 U	0.00018 U	0.00022 U	0.00019 U	0.00017 U
1,1,2-Trichloro-1,2,2-trifluoroethane	mg/Kg			0.00024 U	0.00025 U	0.00030 U	0.00024 U	0.00024 U	0.00025 U	0.00025 U	0.00024 U	0.00025 U	0.00025 U	0.00024 U	0.00025 U	0.00030 U	0.00027 U	0.00025 U
1,1,2-Trichloroethane	mg/Kg			0.00014 U	0.00015 U	0.00018 U	0.00014 U	0.00014 U	0.00015 U	0.00015 U	0.00014 U	0.00015 U	0.00015 U	0.00014 U	0.00015 U	0.00018 U	0.00016 U	0.00015 U
1,1-Dichloroethane	mg/Kg	0.27	26	0.00016 U	0.00017 U	0.00021 U	0.00016 U	0.00016 U	0.00017 U	0.00017 U	0.00017 U	0.00017 U	0.00017 U	0.00016 U	0.00017 U	0.00021 U	0.00018 U	0.00017 U
1,1-Dichloroethene	mg/Kg	0.33	100	0.00018 U	0.00019 U	0.00022 U	0.00018 U	0.00018 U	0.00019 U	0.00019 U	0.00018 U	0.00019 U	0.00018 U	0.00018 U	0.00019 U	0.00023 U	0.00020 U	0.00018 U
1,2,3-Trichlorobenzene	mg/Kg			0.00014 U	0.00015 U	0.00018 U	0.00014 U	0.00014 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00014 U	0.00015 U	0.00018 U	0.00016 U	0.00015 U
1,2,4-Trichlorobenzene	mg/Kg			0.00029 U	0.00030 U	0.00036 U	0.00029 U	0.00029 U	0.00030 U	0.00030 U	0.00029 U	0.00030 U	0.00029 U	0.00028 U	0.00030 U	0.00036 U	0.00032 U	0.00029 U
1,2-Dibromo-3-Chloropropane	mg/Kg			0.00037 U	0.00038 U	0.00046 U	0.00037 U	0.00037 U	0.00038 U	0.00039 U	0.00037 U	0.00039 U	0.00038 U	0.00036 U	0.00038 U	0.00047 U	0.00041 U	0.00038 U
1,2-Dichlorobenzene	mg/Kg	1.1	100	0.00012 U	0.00012 U	0.00014 U	0.00011 U	0.00011 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00011 U	0.00012 U	0.00015 U	0.00013 U	0.00012 U
1,2-Dichloroethane	mg/Kg	0.02	3.1	0.00024 U	0.00025 U	0.00029 U	0.00024 U	0.00024 U	0.00024 U	0.00025 U	0.00024 U	0.00025 U	0.00024 U	0.00023 U	0.00024 U	0.00030 U	0.00026 U	0.00024 U
1,2-Dichloropropane	mg/Kg			0.00034 U	0.00035 U	0.00042 U	0.00034 U	0.00034 U	0.00035 U	0.00036 U	0.00034 U	0.00035 U	0.00035 U	0.00033 U	0.00035 U	0.00043 U	0.00038 U	0.00035 U
1,3-Dichlorobenzene	mg/Kg	2.4	49	0.00013 U	0.00013 U	0.00016 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00013 U	0.00016 U	0.00014 U	0.00013 U
1,4-Dichlorobenzene	mg/Kg	1.8	13	0.00018 U	0.00019 U	0.00022 U	0.00018 U	0.00018 U	0.00019 U	0.00019 U	0.00018 U	0.00019 U	0.00018 U	0.00018 U	0.00019 U	0.00023 U	0.00020 U	0.00018 U
2-Butanone (MEK)	mg/Kg	0.12	100	0.0022 U	0.0022 U	0.0027 U	0.0022 U	0.0022 U	0.0022 U	0.0023 U	0.0022 U	0.0023 U	0.0022 U	0.0021 U	0.0022 U	0.0027 U	0.0024 U	0.0022 U
2-Hexanone	mg/Kg			0.0014 U	0.0014 U	0.0017 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0017 U	0.0015 U	0.0014 U
4-Methyl-2-pentanone (MIBK)	mg/Kg			0.0012 U	0.0013 U	0.0015 U	0.0012 U	0.0012 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0013 U	0.0016 U	0.0014 U	0.0013 U
Acetone	mg/Kg	0.05	100	0.0046 U	**0.0065**	0.0057 U	**0.0049**	**0.0050**	0.0047 U	**0.0063**	0.0046 U	0.0048 U	0.0047 U	0.0045 U	**0.0061**	0.0058 U	0.0051 U	0.0047 U
Benzene	mg/Kg	0.06	4.8	0.00021 U	0.00021 U	0.00026 U	0.00021 U	0.00021 U	0.00021 U	0.00022 U	0.00021 U	0.00022 U	0.00021 U	0.00020 U	0.00021 U	0.00026 U	0.00023 U	0.00021 U
Bromoform	mg/Kg			0.00034 U	0.00035 U	0.00042 U	0.00034 U	0.00034 U	0.00035 U	0.00036 U	0.00034 U	0.00036 U	0.00035 U	0.00034 U	0.00035 U	0.00043 U	0.00038 U	0.00035 U
Bromomethane	mg/Kg			0.00038 U	0.00039 U	0.00047 U	0.00038 U	0.00038 U	0.00039 U	0.00040 U	0.00038 U	0.00040 U	0.00039 U	0.00037 U	0.00039 U	0.00048 U	0.00042 U	0.00039 U
Carbon disulfide	mg/Kg			0.00021 U	**0.00043 J**	0.00026 U	0.00021 U	0.00021 U	0.00022 U	**0.00087**	0.00022 U	0.00022 U	0.00022 U	0.00021 U	**0.00040 J**	0.00027 U	0.00024 U	0.00022 U
Carbon tetrachloride	mg/Kg	0.76	2.4	0.00031 U	0.00032 U	0.00039 U	0.00031 U	0.00031 U	0.00032 U	0.00033 U	0.00031 U	0.00032 U	0.00032 U	0.00031 U	0.00032 U	0.00039 U	0.00035 U	0.00032 U
Chlorobenzene	mg/Kg	1.1	100	0.00014 U	0.00015 U	0.00018 U	0.00014 U	0.00014 U	0.00015 U	0.00015 U	0.00014 U	0.00015 U	0.00014 U	0.00014 U	0.00015 U	0.00018 U	0.00016 U	0.00014 U
Chlorobromomethane	mg/Kg			0.00022 U	0.00023 U	0.00028 U	0.00022 U	0.00022 U	0.00023 U	0.00024 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00023 U	0.00028 U	0.00025 U	0.00023 U
Chlorodibromomethane	mg/Kg			0.00015 U	0.00016 U	0.00019 U	0.00015 U	0.00015 U	0.00016 U	0.00016 U	0.00016 U	0.00016 U	0.00016 U	0.00015 U	0.00016 U	0.00020 U	0.00017 U	0.00016 U
Chloroethane	mg/Kg			0.00042 U	0.00043 U	0.00052 U	0.00042 U	0.00042 U	0.00043 U	0.00044 U	0.00042 U	0.00044 U	0.00043 U	0.00041 U	0.00043 U	0.00053 U	0.00047 U	0.00043 U
Chloroform	mg/Kg	0.37	49	0.00025 U	0.00026 U	0.00032 U	0.00025 U	0.00025 U	0.00026 U	0.00027 U	0.00026 U	0.00027 U	0.00026 U	0.00025 U	0.00026 U	0.00032 U	0.00029 U	0.00026 U
Chloromethane	mg/Kg			0.00035 U	0.00036 U	0.00043 U	0.00035 U	0.00035 U	0.00036 U	0.00037 U	0.00035 U	0.00036 U	0.00036 U	0.00034 U	0.00036 U	0.00044 U	0.00039 U	0.00035 U
cis-1,2-Dichloroethene	mg/Kg	0.25	100	0.00012 U	0.00013 U	0.00015 U	0.00012 U	0.00012 U	0.00013 U	0.00013 U	0.00012 U	0.00013 U	0.00012 U	0.00012 U	0.00013 U	0.00015 U	0.00014 U	0.00012 U
cis-1,3-Dichloropropene	mg/Kg			0.00022 U	0.00023 U	0.00027 U	0.00022 U	0.00022 U	0.00023 U	0.00023 U	0.00022 U	0.00023 U	0.00022 U	0.00022 U	0.00023 U	0.00028 U	0.00024 U	0.00022 U
Cyclohexane	mg/Kg			0.00018 U	0.00018 U	0.00022 U	0.00018 U	0.00018 U	0.00018 U	0.00019 U	0.00018 U	0.00019 U	0.00018 U	0.00017 U	0.00018 U	0.00022 U	0.00020 U	0.00018 U
Dichlorobromomethane	mg/Kg			0.00021 U	0.00021 U	0.00026 U	0.00020 U	0.00021 U	0.00021 U	0.00022 U	0.00021 U	0.00022 U	0.00021 U	0.00020 U	0.00021 U	0.00026 U	0.00023 U	0.00021 U
Dichlorodifluoromethane	mg/Kg			0.00027 U	0.00028 U	0.00034 U	0.00027 U	0.00027 U	0.00028 U	0.00029 U	0.00027 U	0.00028 U	0.00028 U	0.00027 U	0.00028 U	0.00034 U	0.00030 U	0.00028 U
Ethylbenzene	mg/Kg	1	41	0.00016 U	0.00017 U	0.00020 U	0.00016 U	0.00016 U	0.00016 U	0.00017 U	0.00016 U	0.00017 U	0.00016 U	0.00016 U	0.00016 U	0.00020 U	0.00018 U	0.00016 U
Ethylene Dibromide	mg/Kg			0.00014 U	0.00015 U	0.00018 U	0.00014 U	0.00014 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00014 U	0.00015 U	0.00018 U	0.00016 U	0.00015 U
Isopropylbenzene	mg/Kg			0.00010 U	0.00010 U	0.00013 U	0.00010 U	0.00010 U	0.00010 U	0.00011 U	0.00010 U	0.00011 U	0.00010 U	0.000099 U	0.00010 U	0.00013 U	0.00011 U	0.00010 U
Methyl acetate	mg/Kg			0.0034 U	0.0036 U	0.0043 U	0.0034 U	0.0034 U	0.0036 U	0.0036 U	0.0035 U	0.0036 U	0.0035 U	0.0034 U	0.0036 U	0.0043 U	0.0038 U	0.0035 U
Methyl tert-butyl ether	mg/Kg	0.93	100	0.00010 U	0.00010 U	0.00012 U	0.00010 U	0.00010 U	0.00010 U	0.00011 U	0.00010 U	0.00010 U	0.00010 U	0.000099 U	0.00010 U	0.00013 U	0.00011 U	0.00010 U
Methylcyclohexane	mg/Kg			0.00040 U	0.00041 U	0.00050 U	0.00040 U	0.00040 U	0.00041 U	0.00042 U	0.00040 U	0.00042 U	0.00041 U	0.00039 U	0.00041 U	0.00050 U	0.00045 U	0.00041 U
Methylene Chloride	mg/Kg	0.05	100	0.00037 U	0.00038 U	0.00046 U	0.00037 U	0.00037 U	0.00038 U	0.00039 U	0.00038 U	0.00039 U	0.00038 U	0.00037 U	0.00038 U	0.00047 U	0.00041 U	**0.00045 J**
m-Xylene & p-Xylene	mg/Kg	0.26	100	0.00014 U	0.00014 U	0.00017 U	0.00014 U	0.00014 U	0.00014 U	0.00015 U	0.00014 U	0.00015 U	0.00014 U	0.00014 U	0.00014 U	0.00018 U	**0.00024 J**	0.00014 U
o-Xylene	mg/Kg	0.26	100	0.00015 U	0.00016 U	0.00019 U	0.00015 U	0.00015 U	0.00016 U	0.00016 U	0.00016 U	0.00016 U	0.00016 U	0.00015 U	0.00016 U	0.00020 U	0.00017 U	0.00016 U
Styrene	mg/Kg			0.00022 U	0.00023 U	0.00028 U	0.00022 U	0.00022 U	0.00023 U	0.00023 U	0.00023 U	0.00023 U	0.00023 U	0.00022 U	0.00023 U	0.00028 U	0.00025 U	0.00023 U
Tetrachloroethene	mg/Kg	1.3	19	0.00011 U	0.00012 U	0.00014 U	0.00011 U	0.00011 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00011 U	0.00012 U	0.00014 U	0.00013 U	0.00012 U
Toluene	mg/Kg	0.7	100	0.00019 U	0.00019 U	0.00023 U	0.00019 U	0.00019 U	0.00019 U	0.00020 U	0.00019 U	0.00020 U	0.00019 U	0.00018 U	0.00019 U	0.00024 U	0.00021 U	0.00019 U
trans-1,2-Dichloroethene	mg/Kg	0.19	100	0.00020 U	0.00020 U	0.00024 U	0.00020 U	0.00020 U	0.00020 U	0.00021 U	0.00020 U	0.00021 U	0.00020 U	0.00019 U	0.00020 U	0.00025 U	0.00022 U	0.00020 U
trans-1,3-Dichloropropene	mg/Kg			0.00021 U	0.00022 U	0.00026 U	0.00021 U	0.00021 U	0.00022 U	0.00022 U	0.00022 U	0.00022 U	0.00022 U	0.00021 U	0.00022 U	0.00027 U	0.00024 U	0.00022 U
Trichloroethene	mg/Kg	0.47	21	0.00012 U	0.00012 U	0.00014 U	0.00011 U	0.00011 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00012 U	0.00011 U	0.00012 U	0.00015 U	0.00013 U	0.00012 U
Trichlorofluoromethane	mg/Kg			0.00032 U	0.00034 U	0.00040 U	0.00032 U	0.00032 U	0.00034 U	0.00034 U	0.00033 U	0.00034 U	0.00033 U	0.00032 U	0.00034 U	0.00041 U	0.00036 U	0.00033 U
Vinyl chloride	mg/Kg	0.02	0.9	0.00044 U	0.00045 U	0.00054 U	0.00043 U	0.00044 U	0.00045 U	0.00046 U	0.00044 U	0.00046 U	0.00045 U	0.00043 U	0.00045 U	0.00055 U	0.00049 U	0.00045 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approxima

U : Indicates the analyte was analyzed for but not detected.

Table 1B
Summary of Soil Sampling Results
Semi Volatile Organic Compounds (8270)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-19 S-9 (2.5-3) 5/8/2019 10:45 AM	460-181467-20 S-9 (8-8.5) 5/8/2019 10:50 AM	460-181467-21 S-9 (14.5-15) 5/8/2019 10:55 AM	460-181467-22 S-9 (17.5-18) 5/8/2019 11:15 AM	460-181467-23 S-9 (23.5-24) 5/8/2019 11:20 AM	460-181467-13 S-10 (4-4.5) 5/8/2019 9:35 AM	460-181467-14 S-10 (8.5-9) 5/8/2019 9:40 AM	460-181467-15 S-10 (11.5-12) 5/8/2019 9:50 AM	460-181467-10 S-11 (2.2-2.5) 5/8/2019 9:15 AM	460-181467-11 S-11 (6.5-7) 5/8/2019 9:20 AM	460-181467-12 S-11 (13-13.5) 5/8/2019 9:30 AM	460-181391-32 S-12 (2-2.5) 5/7/2019 10:00 AM	460-181391-23 S-12 (6.5-7) 5/7/2019 10:15 AM	460-181391-24 S-12 (11-11.5) 5/7/2019 10:20 AM
SOIL BY 8270D																	
1,1'-Biphenyl	mg/Kg			0.0046 U	0.0048 U	0.0047 U	0.0048 U	0.0047 U	0.0048 U	0.0048 U	0.0047 U	**0.0052 U**	0.0048 U	0.0049 U	0.0050 U	0.0050 U	**0.0049 U**
1,2,4,5-Tetrachlorobenzene	mg/Kg			0.0046 U	0.0047 U	0.0046 U	0.0047 U	0.0046 U	0.0048 U	0.0047 U	0.0046 U	**0.0051 U**	0.0048 U	0.0048 U	0.0050 U	0.0049 U	**0.0049 U**
1,4-Dioxane	mg/Kg	0.1	13	0.0097 U	0.0099 U	0.0098 U	0.0099 U	0.0098 U	0.010 U	0.010 U	0.0097 U	0.011 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
2,2'-oxybis[1-chloropropane]	mg/Kg			0.0063 U	0.0065 U	0.0064 U	0.0065 U	0.0064 U	0.0066 U	0.0065 U	0.0064 U	**0.0071 U**	0.0066 U	0.0066 U	0.0069 U	0.0068 U	**0.0067 U**
2,3,4,6-Tetrachlorophenol	mg/Kg			0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.025 U	0.024 U	0.024 U	**0.027 U**	0.025 U	0.025 U	0.026 U	0.025 U	**0.025 U**
2,4,5-Trichlorophenol	mg/Kg			0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	**0.013 U**	0.012 U	0.012 U	0.013 U	0.012 U	**0.012 U**
2,4,6-Trichlorophenol	mg/Kg			0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	**0.020 U**	0.018 U	0.018 U	0.019 U *	0.019 U *	**0.019 U ***
2,4-Dichlorophenol	mg/Kg			0.0074 U	0.0076 U	0.0075 U	0.0076 U	0.0075 U	0.0077 U	0.0076 U	0.0075 U	**0.0083 U**	0.0077 U	0.0077 U	0.0080 U *	0.0079 U *	**0.0078 U ***
2,4-Dimethylphenol	mg/Kg			0.015 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	**0.017 U**	0.016 U	0.016 U	0.017 U	0.016 U	**0.016 U**
2,4-Dinitrophenol	mg/Kg			0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.18 U	0.18 U	0.17 U	**0.19 U**	0.18 U	0.18 U	0.19 U	0.18 U	**0.18 U**
2,4-Dinitrotoluene	mg/Kg			0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	**0.020 U**	0.018 U	0.019 U	0.019 U	0.019 U	**0.019 U**
2,6-Dinitrotoluene	mg/Kg			0.011 U	0.012 U	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U	**0.013 U**	0.012 U	0.012 U	0.012 U	0.012 U	**0.012 U**
2-Chloronaphthalene	mg/Kg			0.016 U	0.017 U	0.016 U	0.017 U	0.016 U	0.017 U	0.017 U	0.016 U	**0.018 U**	0.017 U	0.017 U	0.018 U	0.017 U	**0.017 U**
2-Chlorophenol	mg/Kg			0.0049 U	0.0050 U	0.0050 U	0.0051 U	0.0050 U	0.0051 U	0.0051 U	0.0049 U	**0.0055 U**	0.0051 U	0.0051 U	0.0053 U	0.0052 U	**0.0052 U**
2-Methylnaphthalene	mg/Kg			0.0044 U	0.0045 U	0.0044 U	0.0045 U	0.0044 U	0.0046 U	0.0045 U	0.0044 U	**0.059 J**	0.0045 U	0.0046 U	0.0047 U	0.0047 U	**0.0046 U**
2-Methylphenol	mg/Kg	0.33	100	0.0056 U	0.0058 U	0.0057 U	0.0058 U	0.0057 U	0.0059 U	0.0058 U	0.0057 U	**0.0063 U**	0.0059 U	0.0059 U	0.0061 U	0.0060 U	**0.0060 U**
2-Nitroaniline	mg/Kg			0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.014 U	0.014 U	0.013 U	**0.015 U**	0.014 U	0.014 U	0.014 U	0.014 U	**0.014 U**
2-Nitrophenol	mg/Kg			0.011 U	0.012 U	0.011 U	0.012 U	0.011 U	0.012 U	0.012 U	0.011 U	**0.013 U**	0.012 U	0.012 U	0.012 U	0.012 U	**0.012 U**
3,3'-Dichlorobenzidine	mg/Kg			0.053 U	0.054 U	0.053 U	0.054 U	0.053 U	0.055 U	0.055 U	0.053 U	**0.059 U**	0.055 U	0.055 U	0.057 U	0.056 U	**0.056 U**
3-Nitroaniline	mg/Kg			0.019 U	0.020 U	0.019 U	0.020 U	0.019 U	0.020 U	0.020 U	0.019 U	**0.021 U**	0.020 U	0.020 U	0.021 U	0.020 U	**0.020 U**
4,6-Dinitro-2-methylphenol	mg/Kg			0.057 U	0.058 U	0.057 U	0.059 U	0.057 U	0.059 U	0.059 U	0.057 U	**0.064 U**	0.059 U	0.060 U	0.062 U	0.061 U	**0.060 U**
4-Bromophenyl phenyl ether	mg/Kg			0.0045 U	0.0047 U	0.0046 U	0.0047 U	0.0046 U	0.0047 U	0.0047 U	0.0046 U	**0.0051 U**	0.0047 U	0.0047 U	0.0049 U	0.0048 U	**0.0048 U**
4-Chloro-3-methylphenol	mg/Kg			0.0058 U	0.0060 U	0.0059 U	0.0060 U	0.0059 U	0.0061 U	0.0060 U	0.0059 U	**0.0065 U**	0.0060 U	0.0061 U	0.0063 U	0.0062 U	**0.0062 U**
4-Chloroaniline	mg/Kg			0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.026 U	0.025 U	0.025 U	**0.027 U**	0.025 U	0.026 U	0.027 U	0.026 U	**0.026 U**
4-Chlorophenyl phenyl ether	mg/Kg			0.0055 U	0.0057 U	0.0056 U	0.0057 U	0.0056 U	0.0057 U	0.0057 U	0.0056 U	**0.0062 U**	0.0057 U	0.0058 U	0.0060 U	0.0059 U	**0.0058 U**
4-Methylphenol	mg/Kg	0.33	100	0.0060 U	0.0061 U	0.0060 U	0.0061 U	0.0060 U	0.0062 U	0.0062 U	0.0060 U	**0.0067 U**	0.0062 U	0.0062 U	0.0065 U	0.0064 U	**0.0063 U**
4-Nitroaniline	mg/Kg			0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.014 U	0.013 U	0.013 U	**0.040 J**	0.014 U	0.014 U	0.014 U	0.014 U	**0.014 U**
4-Nitrophenol	mg/Kg			0.057 U	0.059 U	0.058 U	0.059 U	0.058 U	0.059 U	0.059 U	0.058 U	**0.064 U**	0.059 U	0.060 U	0.062 U	0.061 U	**0.060 U**
Acenaphthene	mg/Kg	20	100	0.025 U	0.026 U	0.026 U	0.026 U	0.026 U	0.027 U	0.026 U	0.026 U	**0.029 U**	0.026 U	0.027 U	0.028 U	0.027 U	**0.027 U**
Acenaphthylene	mg/Kg	100	100	0.0036 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0036 U	**0.15 J**	0.0038 U	0.0038 U	0.0039 U	0.0039 U	**0.025 J**
Acetophenone	mg/Kg			0.0056 U	0.0058 U	0.0057 U	0.0058 U	0.0057 U	0.0059 U	0.0058 U	0.0057 U	**0.0063 U**	0.0059 U	0.0059 U	0.0061 U	0.0060 U	**0.0060 U**
Anthracene	mg/Kg	100	100	0.0039 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0041 U	0.0040 U	0.0039 U	**0.14 J**	0.0041 U	0.0041 U	0.0042 U	0.0042 U	**0.0041 U**
Atrazine	mg/Kg			0.0088 U	0.0091 U	0.0089 U	0.0091 U	0.0089 U	0.0092 U	0.0091 U	0.0089 U	**0.0099 U**	0.0092 U	0.0093 U	0.0096 U	0.0094 U	**0.0094 U**
Benzaldehyde	mg/Kg			0.015 U	0.016 U	0.015 U	0.016 U	0.015 U	0.016 U	0.016 U	0.015 U	**0.017 U**	0.016 U	0.016 U	0.017 U	0.016 U	**0.016 U**
Benzo[a]anthracene	mg/Kg	1	1	0.012 U	0.013 U	0.012 U	0.013 U	0.012 U	0.013 U	0.013 U	0.012 U	**0.81**	0.013 U	0.013 U	0.013 U	0.013 U	**0.17**
Benzo[a]pyrene	mg/Kg	1	1	0.0093 U	0.0096 U	0.0094 U	0.0096 U	0.0094 U	0.0097 U	0.0096 U	0.0094 U	**0.78**	0.0097 U	0.0098 U	0.010 U	0.0099 U	**0.19**
Benzo[b]fluoranthene	mg/Kg	1	1	0.0091 U	0.0093 U	0.0092 U	0.0093 U	0.0092 U	0.0094 U	0.0094 U	0.0091 U	**1.2**	0.0094 U	0.0095 U	0.0098 U	0.0097 U	**0.24**
Benzo[g,h,i]perylene	mg/Kg	100	100	0.010 U	0.011 U	0.010 U	0.011 U	0.010 U	0.011 U	0.011 U	0.010 U	**0.48**	0.011 U	0.011 U	0.011 U	0.011 U	**0.13 J**
Benzo[k]fluoranthene	mg/Kg	0.8	3.9	0.0069 U	0.0071 U	0.0069 U	0.0071 U	0.0069 U	0.0072 U	0.0071 U	0.0069 U	**0.41**	0.0071 U	0.0072 U	0.0075 U	0.0073 U	**0.14**
Bis(2-chloroethoxy)methane	mg/Kg			0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	**0.013 U**	0.012 U	0.013 U	0.013 U	0.013 U	**0.013 U**
Bis(2-chloroethyl)ether	mg/Kg			0.0042 U	0.0044 U	0.0043 U	0.0044 U	0.0043 U	0.0044 U	0.0044 U	0.0043 U	**0.0047 U**	0.0044 U	0.0044 U	0.0046 U	0.0045 U	**0.0045 U**
Bis(2-ethylhexyl) phthalate	mg/Kg			0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	**0.021 U**	0.019 U	0.019 U	0.020 U	0.020 U	**0.020 U**
Butyl benzyl phthalate	mg/Kg			0.016 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	**0.018 U**	0.017 U	0.017 U	0.018 U	0.018 U	**0.017 U**
Caprolactam	mg/Kg			0.021 U	0.022 U	0.021 U	0.022 U	0.021 U	0.022 U	0.022 U	0.021 U	**0.024 U**	0.022 U	0.022 U	0.023 U	0.022 U	**0.022 U**
Carbazole	mg/Kg			0.0041 U	0.0042 U	0.0041 U	0.0042 U	0.0041 U	0.0043 U	0.0042 U	0.0041 U	**0.055 J**	0.0043 U	0.0043 U	0.0044 U	0.0044 U	**0.0043 U**
Chrysene	mg/Kg	1	3.9	0.0059 U	0.0061 U	0.0060 U	0.0061 U	0.0060 U	0.0062 U	0.0061 U	0.0060 U	**0.96**	0.0061 U	0.0062 U	0.0064 U	0.0063 U	**0.17 J**
Dibenz(a,h)anthracene	mg/Kg	0.33	0.33	0.015 U	0.016 U	0.015 U	0.016 U	0.015 U	0.016 U	0.016 U	0.015 U	**0.098**	0.016 U	0.016 U	0.016 U	0.016 U	**0.034 J**
Dibenzofuran	mg/Kg	7	59	0.0049 U	0.0051 U	0.0050 U	0.0051 U	0.0050 U	0.0051 U	0.0051 U	0.0050 U	**0.027 J**	0.0051 U	0.0052 U	0.0053 U	0.0052 U	**0.0052 U**
Diethyl phthalate	mg/Kg			0.0051 U	0.0052 U	0.0051 U	0.0052 U	0.0051 U	0.0053 U	0.0052 U	0.0051 U	**0.0057 U**	0.0053 U	0.0053 U	0.0055 U	0.0054 U	**0.0054 U**
Dimethyl phthalate	mg/Kg			0.0042 U	0.0043 U	0.0043 U	0.0044 U	0.0043 U	0.0044 U	0.0044 U	0.0043 U	**0.0047 U**	0.0044 U	0.0044 U	0.0046 U	0.0045 U	**0.0045 U**
Di-n-butyl phthalate	mg/Kg			0.062 U	0.064 U	0.062 U	0.064 U	0.062 U	0.064 U	0.064 U	0.062 U	**0.21 J**	0.064 U	0.065 U	0.067 U	0.066 U	**0.065 U**
Di-n-octyl phthalate	mg/Kg			0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	**0.021 U**	0.019 U	0.019 U	0.020 U	0.020 U	**0.020 U**
Fluoranthene	mg/Kg	100	100	0.0045 U	0.0047 U	0.0046 U	0.0047 U	0.0046 U	0.0047 U	0.0047 U	0.0046 U	**1.4**	0.0047 U	0.0048 U	0.0049 U	0.0048 U	**0.32 J**
Fluorene	mg/Kg	30	100	0.0047 U	0.0049 U	0.0048 U	0.0049 U	0.0048 U	0.0049 U	0.0049 U	0.0048 U	**0.034 J**	0.0049 U	0.0050 U	0.0052 U	0.0051 U	**0.0050 U**
Hexachlorobenzene	mg/Kg	0.33	1.2	0.0051 U	0.0053 U	0.0052 U	0.0053 U	0.0052 U	0.0053 U	0.0053 U	0.0052 U	**0.0058 U**	0.0053 U	0.0054 U	0.0056 U	0.0055 U	**0.0054 U**
Hexachlorobutadiene	mg/Kg			0.0075 U	0.0077 U	0.0075 U	0.0077 U	0.0075 U	0.0078 U	0.0077 U	0.0075 U	**0.0084 U**	0.0077 U	0.0078 U	0.0081 U *	0.0079 U *	**0.0079 U ***
Hexachlorocyclopentadiene	mg/Kg			0.031 U	0.032 U	0.031 U	0.032 U	0.031 U	0.032 U	0.032 U	0.031 U	**0.034 U**	0.032 U	0.032 U	0.033 U	0.033 U	**0.033 U**
Hexachloroethane	mg/Kg			0.0054 U	0.0056 U	0.0055 U	0.0056 U	0.0055 U	0.0056 U	0.0056 U	0.0054 U	**0.0061 U**	0.0056 U	0.0057 U	0.0059 U	0.0058 U	**0.0057 U**
Indeno[1,2,3-cd]pyrene	mg/Kg	0.5	0.5	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	**0.56**	0.014 U	0.014 U	0.015 U	0.015 U	**0.14**
Isophorone	mg/Kg			0.0092 U	0.0095 U	0.0093 U	0.0095 U	0.0093 U	0.0096 U	0.0095 U	0.0093 U	**0.010 U**	0.0096 U	0.0096 U	0.010 U	0.0098 U	**0.0098 U**
Naphthalene	mg/Kg	12	100	0.0061 U	0.0062 U	0.0061 U	0.0062 U	0.0061 U	0.0063 U	0.0062 U	0.0061 U	**0.077 J**	0.0063 U	0.0063 U	0.0066 U	0.0065 U	**0.0064 U**
Nitrobenzene	mg/Kg			0.0084 U	0.0086 U	0.0085 U	0.0087 U	0.0085 U	0.0088 U	0.0087 U	0.0085 U	**0.0094 U**	0.0087 U	0.0088 U	0.0091 U	0.0090 U	**0.0089 U**
N-Nitrosodi-n-propylamine	mg/Kg			0.0056 U	0.0057 U	0.0056 U	0.0057 U	0.0056 U	0.0058 U	0.0058 U	0.0056 U	**0.0063 U**	0.0058 U	0.0058 U	0.0060 U	0.0059 U	**0.0059 U**
N-Nitrosodiphenylamine	mg/Kg			0.0067 U	0.0069 U	0.0068 U	0.0069 U	0.0068 U	0.0070 U	0.0069 U	0.0068 U	**0.0075 U**	0.0070 U	0.0070 U	0.0073 U	0.0071 U	**0.0071 U**
Pentachlorophenol	mg/Kg	0.8	6.7	0.072 U	0.074 U	0.073 U	0.074 U	0.073 U	0.075 U	0.074 U	0.072 U	**0.080 U**	0.075 U	0.075 U	0.078 U	0.077 U	**0.076 U**
Phenanthrene	mg/Kg	100	100	0.0062 U	0.0063 U	0.0062 U	0.0063 U	0.0062 U	0.0064 U	0.0064 U	0.0062 U	**0.59**	0.0064 U	0.0064 U	0.0067 U	0.0066 U	**0.063 J**
Phenol	mg/Kg	0.33	100	0.0052 U	0.0053 U	0.0052 U	0.0053 U	0.0052 U	0.0054 U	0.0054 U	0.0052 U	**0.0058 U**	0.0054 U	0.0054 U	0.0056 U	0.0055 U	**0.0055 U**
Pyrene	mg/Kg	100	100	0.0087 U	0.0090 U	0.0088 U	0.0090 U	0.0088 U	0.0091 U	0.0090 U	0.0088 U	**1.5**	0.0090 U	0.0091 U	0.0094 U	0.0093 U	**0.29 J**

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1B
Summary of Soil Sampling Results
Semi Volatile Organic Compounds (8270)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-31 S-13 (2-2.5) 5/7/2019 9:30 AM	460-181391-8 S-13 (8-8.5) 5/7/2019 9:40 AM	460-181391-14 S-13 (11.5-12) 5/7/2019 9:50 AM	460-181391-28 S-14 (4-4.5) 5/7/2019 9:15 AM	460-181391-33 S-14 (9-9.5) 5/7/2019 9:16 AM	460-181391-3 S-14 (10.5-11) 5/7/2019 9:25 AM	460-181391-1 S-15 (2-2.5) 5/7/2019 8:55 AM	460-181391-30 S-15 (8-8.5) 5/7/2019 9:00 AM	460-181391-2 S-15 (11-11.5) 5/7/2019 9:10 AM	460-181391-19 S-16 (3-3.5) 5/7/2019 8:25 AM	460-181391-6 S-16 (7-7.5) 5/7/2019 8:40 AM	460-181391-7 S-16 (11.5-12) 5/7/2019 8:50 AM	460-181391-26 S-17 (3-3.5) 5/7/2019 11:25 AM
SOIL BY 8270D																
1,1'-Biphenyl	mg/Kg			**0.0055 U**	0.0049 U	0.0048 U	0.0048 U	0.0048 U	**0.023 J**	0.0053 U	0.0048 U	0.0049 U	0.0051 U	0.0046 U	0.0048 U	0.0052 U
1,2,4,5-Tetrachlorobenzene	mg/Kg			**0.0054 U**	0.0048 U	0.0048 U	0.0047 U	0.0047 U	0.0048 U	0.0052 U	0.0047 U	0.0049 U	0.0051 U	0.0045 U	0.0047 U	0.0052 U
1,4-Dioxane	mg/Kg	0.1	13	0.011 U	0.010 U	0.010 U	0.0099 U	0.0099 U	0.010 U	0.011 U	0.0099 U	0.010 U	0.011 U	0.0096 U	0.010 U	0.011 U
2,2'-oxybis[1-chloropropane]	mg/Kg			**0.0075 U**	0.0066 U	0.0066 U	0.0065 U	0.0065 U	0.0066 U	0.0072 U	0.0065 U	0.0067 U	0.0070 U	0.0063 U	0.0066 U	0.0071 U
2,3,4,6-Tetrachlorophenol	mg/Kg			**0.028 U**	0.025 U	0.025 U	0.024 U	0.024 U	0.025 U	0.027 U	0.024 U	0.025 U	0.026 U	0.024 U	0.025 U	0.027 U
2,4,5-Trichlorophenol	mg/Kg			**0.014 U**	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.011 U	0.012 U	0.013 U
2,4,6-Trichlorophenol	mg/Kg			**0.021 U** *	0.018 U	0.018 U	0.018 U *	0.018 U *	0.018 U	0.020 U	0.018 U *	0.019 U	0.019 U	0.018 U	0.018 U	0.020 U *
2,4-Dichlorophenol	mg/Kg			**0.0088 U** *	0.0077 U	0.0077 U	0.0076 U *	0.0076 U *	0.0077 U	0.0084 U	0.0076 U *	0.0078 U	0.0081 U	0.0073 U	0.0077 U	0.0083 U *
2,4-Dimethylphenol	mg/Kg			**0.018 U**	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.018 U	0.016 U	0.016 U	0.017 U	0.015 U	0.016 U	0.017 U
2,4-Dinitrophenol	mg/Kg			**0.20 U**	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.20 U	0.18 U	0.18 U	0.19 U	0.17 U	0.18 U	0.19 U
2,4-Dinitrotoluene	mg/Kg			**0.021 U**	0.019 U	0.018 U	0.018 U	0.018 U	0.018 U	0.020 U	0.018 U	0.019 U	0.020 U	0.018 U	0.018 U	0.020 U
2,6-Dinitrotoluene	mg/Kg			**0.013 U**	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.012 U	0.011 U	0.012 U	0.013 U
2-Chloronaphthalene	mg/Kg			**0.019 U**	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.019 U	0.017 U	0.017 U	0.018 U	0.016 U	0.017 U	0.018 U
2-Chlorophenol	mg/Kg			**0.0058 U**	0.0051 U	0.0051 U	0.0050 U	0.0050 U	0.0051 U	0.0056 U	0.0050 U	0.0052 U	0.0054 U	0.0049 U	0.0051 U	0.0055 U
2-Methylnaphthalene	mg/Kg			**0.0052 U**	0.0046 U	0.0045 U	0.0045 U	0.0045 U	**0.22 J**	0.0050 U	0.0045 U	0.0046 U	**0.011 J**	0.0043 U	0.0045 U	0.0049 U
2-Methylphenol	mg/Kg	0.33	100	**0.0067 U**	0.0059 U	0.0059 U	0.0058 U	0.0058 U	0.0059 U	0.0065 U	0.0058 U	0.0060 U	0.0062 U	0.0056 U	0.0058 U	0.0064 U
2-Nitroaniline	mg/Kg			**0.016 U**	0.014 U	0.014 U	0.013 U	0.013 U	0.014 U	0.015 U	0.013 U	0.014 U	0.014 U	0.013 U	0.014 U	0.015 U
2-Nitrophenol	mg/Kg			**0.013 U**	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.012 U	0.011 U	0.012 U	0.013 U
3,3'-Dichlorobenzidine	mg/Kg			**0.063 U**	0.055 U	0.055 U	0.054 U	0.054 U	0.055 U	0.060 U	0.054 U	0.056 U	0.058 U	0.052 U	0.055 U	0.060 U
3-Nitroaniline	mg/Kg			**0.023 U**	0.020 U	0.020 U	0.019 U	0.019 U	0.020 U	0.022 U	0.020 U	0.020 U	0.021 U	0.019 U	0.020 U	0.021 U
4,6-Dinitro-2-methylphenol	mg/Kg			**0.067 U**	0.059 U	0.059 U	0.058 U	0.058 U	0.059 U	0.065 U	0.058 U	0.060 U	0.063 U	0.056 U	0.059 U	0.064 U
4-Bromophenyl phenyl ether	mg/Kg			**0.0054 U**	0.0047 U	0.0047 U	0.0046 U	0.0046 U	0.0047 U	0.0052 U	0.0047 U	0.0048 U	0.0050 U	0.0045 U	0.0047 U	0.0051 U
4-Chloro-3-methylphenol	mg/Kg			**0.0069 U**	0.0061 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0066 U	0.0060 U	0.0062 U	0.0064 U	0.0058 U	0.0060 U	0.0066 U
4-Chloroaniline	mg/Kg			**0.029 U**	0.026 U	0.025 U	0.025 U	0.025 U	0.025 U	0.028 U	0.025 U	0.026 U	0.027 U	0.024 U	0.025 U	0.028 U
4-Chlorophenyl phenyl ether	mg/Kg			**0.0065 U**	0.0058 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0063 U	0.0057 U	0.0059 U	0.0061 U	0.0055 U	0.0057 U	0.0062 U
4-Methylphenol	mg/Kg	0.33	100	**0.0071 U**	0.0062 U	0.0062 U	0.0061 U	0.0061 U	0.0062 U	0.0068 U	0.0061 U	0.0063 U	0.0066 U	0.0059 U	0.0062 U	0.0067 U
4-Nitroaniline	mg/Kg			**0.015 U**	0.014 U	0.014 U	0.013 U	0.013 U	0.014 U	0.015 U	0.013 U	0.014 U	**0.069 J**	0.013 U	0.014 U	0.015 U
4-Nitrophenol	mg/Kg			**0.068 U**	0.060 U	0.059 U	0.059 U	0.058 U	0.059 U	0.065 U	0.059 U	0.060 U	0.063 U	0.057 U	0.059 U	0.064 U
Acenaphthene	mg/Kg	20	100	**0.030 U**	0.027 U	0.026 U	0.026 U	0.026 U	0.026 U	0.029 U	0.026 U	0.027 U	0.028 U	0.025 U	0.026 U	0.029 U
Acenaphthylene	mg/Kg	100	100	**0.0043 U**	0.0038 U	0.0038 U	0.0037 U	0.0037 U	**0.016 J**	0.0041 U	0.0037 U	0.0038 U	**0.035 J**	0.0036 U	0.0037 U	0.0041 U
Acetophenone	mg/Kg			**0.0067 U**	0.0059 U	0.0059 U	0.0058 U	0.0058 U	0.0059 U	0.0064 U	0.0058 U	0.0060 U	0.0062 U	0.0056 U	0.0058 U	0.0064 U
Anthracene	mg/Kg	100	100	**0.025 J**	0.0041 U	0.0041 U	0.0040 U	0.0040 U	**0.037 J**	0.0045 U	0.0040 U	0.0041 U	**0.055 J**	0.0039 U	0.0041 U	0.0044 U
Atrazine	mg/Kg			**0.010 U**	0.0092 U	0.0092 U	0.0091 U	0.0090 U	0.0092 U	0.010 U	0.0091 U	0.0094 U	0.0097 U	0.0088 U	0.0091 U	0.0099 U
Benzaldehyde	mg/Kg			**0.018 U**	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.017 U	0.015 U	0.016 U	0.017 U
Benzo[a]anthracene	mg/Kg	1	1	**0.22**	0.013 U	**0.022 J**	0.013 U	0.013 U	**0.15**	**0.091**	0.013 U	0.013 U	**0.36**	0.012 U	0.013 U	0.014 U
Benzo[a]pyrene	mg/Kg	1	1	**0.20**	0.0098 U	0.0097 U	0.0096 U	0.0095 U	**0.11**	**0.097**	0.0096 U	0.0099 U	**0.40**	0.0093 U	0.0097 U	0.011 U
Benzo[b]fluoranthene	mg/Kg	1	1	**0.41**	0.0095 U	**0.023 J**	0.0093 U	0.0093 U	**0.21**	**0.13**	0.0093 U	**0.027 J**	**0.60**	0.0090 U	0.0094 U	0.010 U
Benzo[g,h,i]perylene	mg/Kg	100	100	**0.19 J**	0.011 U	0.011 U	0.011 U	0.011 U	**0.057 J**	**0.060 J**	0.011 U	0.011 U	**0.17 J**	0.010 U	0.011 U	0.012 U
Benzo[k]fluoranthene	mg/Kg	0.8	3.9	**0.11**	0.0072 U	0.0071 U	0.0070 U	0.0070 U	**0.056**	**0.046**	0.0071 U	0.0073 U	**0.19**	0.0068 U	0.0071 U	0.0077 U
Bis(2-chloroethoxy)methane	mg/Kg			**0.014 U**	0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.014 U	0.012 U	0.013 U	0.013 U	0.012 U	0.012 U	0.014 U
Bis(2-chloroethyl)ether	mg/Kg			**0.0050 U**	0.0044 U	0.0044 U	0.0043 U	0.0043 U	0.0044 U	0.0048 U	0.0043 U	0.0045 U	0.0047 U	0.0042 U	0.0044 U	0.0048 U
Bis(2-ethylhexyl) phthalate	mg/Kg			**0.022 U**	0.019 U	0.019 U	0.019 U	0.019 U	**0.098 J**	0.021 U	0.019 U	0.020 U	**0.13 J**	0.018 U	0.019 U	0.021 U
Butyl benzyl phthalate	mg/Kg			**0.019 U**	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.019 U	0.017 U	0.017 U	0.018 U	0.016 U	0.017 U	0.018 U
Caprolactam	mg/Kg			**0.025 U**	0.022 U	0.022 U	0.022 U	0.021 U	0.022 U	0.024 U	0.022 U	0.022 U	0.023 U	0.021 U	0.022 U	0.024 U
Carbazole	mg/Kg			**0.032 J**	0.0043 U	0.0043 U	0.0042 U	0.0042 U	**0.018 J**	0.0047 U	0.0042 U	0.0043 U	**0.030 J**	0.0041 U	0.0042 U	0.0046 U
Chrysene	mg/Kg	1	3.9	**0.33 J**	0.0062 U	**0.017 J**	0.0061 U	0.0061 U	**0.18 J**	**0.11 J**	0.0061 U	0.0063 U	**0.40**	0.0059 U	0.0061 U	0.0067 U
Dibenz(a,h)anthracene	mg/Kg	0.33	0.33	**0.052**	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	**0.036 J**	0.015 U	0.016 U	0.017 U
Dibenzofuran	mg/Kg	7	59	**0.0058 U**	0.0051 U	0.0051 U	0.0050 U	0.0050 U	**0.021 J**	0.0056 U	0.0051 U	0.0052 U	0.0054 U	0.0049 U	0.0051 U	0.0055 U
Diethyl phthalate	mg/Kg			**0.0060 U**	0.0053 U	0.0053 U	0.0052 U	0.0052 U	0.0053 U	0.0058 U	0.0052 U	0.0054 U	0.0056 U	0.0050 U	0.0053 U	0.0057 U
Dimethyl phthalate	mg/Kg			**0.0050 U**	0.0044 U	0.0044 U	0.0043 U	0.0043 U	0.0044 U	0.0048 U	0.0043 U	0.0045 U	0.0047 U	0.0042 U	0.0044 U	0.0048 U
Di-n-butyl phthalate	mg/Kg			**0.073 U**	0.065 U	0.064 U	0.063 U	0.063 U	0.064 U	0.071 U	0.063 U	0.065 U	**0.23 J**	0.061 U	0.064 U	0.070 U
Di-n-octyl phthalate	mg/Kg			**0.022 U**	0.019 U	0.019 U	0.019 U	0.019 U	0.019 U	0.021 U	0.019 U	0.020 U	0.020 U	0.018 U	0.019 U	0.021 U
Fluoranthene	mg/Kg	100	100	**0.47**	0.0048 U	0.0047 U	0.0047 U	0.0047 U	**0.33 J**	**0.15 J**	0.0047 U	**0.023 J**	**0.68**	0.0045 U	0.0047 U	0.0051 U
Fluorene	mg/Kg	30	100	**0.0056 U**	0.0050 U	0.0049 U	0.0049 U	0.0049 U	**0.041 J**	0.0054 U	0.0049 U	0.0050 U	**0.015 J**	0.0047 U	0.0049 U	0.0054 U
Hexachlorobenzene	mg/Kg	0.33	1.2	**0.0061 U**	0.0054 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0059 U	0.0053 U	0.0054 U	0.0057 U	0.0051 U	0.0053 U	0.0058 U
Hexachlorobutadiene	mg/Kg			**0.0088 U** *	0.0078 U	0.0077 U	0.0076 U *	0.0076 U *	0.0077 U	0.0085 U	0.0077 U *	0.0079 U	0.0082 U	0.0074 U	0.0077 U	0.0084 U *
Hexachlorocyclopentadiene	mg/Kg			**0.036 U**	0.032 U	0.032 U	0.032 U	0.031 U	0.032 U	0.035 U	0.032 U	0.033 U	0.034 U	0.030 U	0.032 U	0.035 U
Hexachloroethane	mg/Kg			**0.0064 U**	0.0056 U	0.0056 U	0.0055 U	0.0055 U	0.0056 U	0.0062 U	0.0055 U	0.0057 U	0.0059 U	0.0054 U	0.0056 U	0.0061 U
Indeno[1,2,3-cd]pyrene	mg/Kg	0.5	0.5	**0.21**	0.014 U	0.014 U	0.014 U	0.014 U	**0.066**	**0.066**	0.014 U	0.014 U	**0.23**	0.014 U	0.014 U	0.015 U
Isophorone	mg/Kg			**0.011 U**	0.0096 U	0.0096 U	0.0095 U	0.0094 U	0.0096 U	0.011 U	0.0095 U	0.0098 U	0.010 U	0.0091 U	0.0095 U	0.010 U
Naphthalene	mg/Kg	12	100	**0.0072 U**	0.0063 U	0.0063 U	0.0062 U	0.0062 U	**0.026 J**	0.0069 U	0.0062 U	0.0064 U	**0.021 J**	0.0060 U	0.0063 U	0.0068 U
Nitrobenzene	mg/Kg			**0.010 U**	0.0088 U	0.0087 U	0.0086 U	0.0086 U	0.0087 U	0.0096 U	0.0086 U	0.0089 U	0.0093 U	0.0083 U	0.0087 U	0.0095 U
N-Nitrosodi-n-propylamine	mg/Kg			**0.0066 U**	0.0058 U	0.0058 U	0.0057 U	0.0057 U	0.0058 U	0.0064 U	0.0057 U	0.0059 U	0.0061 U	0.0055 U	0.0058 U	0.0063 U
N-Nitrosodiphenylamine	mg/Kg			**0.0079 U**	0.0070 U	0.0070 U	0.0069 U	0.0069 U	0.0070 U	0.0077 U	0.0069 U	0.0071 U	0.0074 U	0.0066 U	0.0069 U	0.0075 U
Pentachlorophenol	mg/Kg	0.8	6.7	**0.085 U**	0.075 U	0.075 U	0.074 U	0.073 U	0.075 U	0.082 U	0.074 U	0.076 U	0.079 U	0.071 U	0.074 U	0.081 U
Phenanthrene	mg/Kg	100	100	**0.14 J**	0.0064 U	0.0064 U	0.0063 U	0.0063 U	**0.22 J**	**0.067 J**	0.0063 U	0.0065 U	**0.26 J**	0.0061 U	0.0064 U	0.0069 U
Phenol	mg/Kg	0.33	100	**0.0062 U**	0.0054 U	0.0054 U	0.0053 U	0.0053 U	0.0054 U	0.0059 U	0.0053 U	0.0055 U	0.0057 U	0.0051 U	0.0054 U	0.0058 U
Pyrene	mg/Kg	100	100	**0.44**	0.0091 U	**0.029 J**	0.0089 U	0.0089 U	**0.28 J**	**0.16 J**	0.0089 U	0.0092 U	**0.62**	0.0086 U	0.0090 U	0.0098 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1B
Summary of Soil Sampling Results
Semi Volatile Organic Compounds (8270)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-18 S-17 (7-7.5) 5/7/2019 11:35 AM	460-181391-9 S-17 (13.5-14) 5/7/2019 11:45 AM	460-181391-27 S-18 (2-2.5) 5/7/2019 11:50 AM	460-181391-16 S-18 (6-6.5) 5/7/2019 12:00 PM	460-181391-15 S-18 (12-12.5) 5/7/2019 12:10 PM	460-181391-36 S-19 (1.5-2) 5/7/2019 12:20 PM	460-181391-25 S-19 (7-7.5) 5/7/2019 12:30 PM	460-181391-10 S-19 (12-12.5) 5/7/2019 12:40 PM	460-181391-5 S-20 (4.5-5) 5/7/2019 10:35 AM	460-181391-17 S-20 (9-9.5) 5/7/2019 10:45 AM	460-181391-34 S-20 (14-14.5) 5/7/2019 10:55 AM	460-181391-22 S-20 (17-17.5) 5/7/2019 11:05 AM	460-181391-21 S-20 (20-20.5) 5/7/2019 11:15 AM
SOIL BY 8270D																
1,1'-Biphenyl	mg/Kg			0.0048 U	0.0048 U	0.0052 U	0.0048 U	0.0048 U	0.0052 U	0.0048 U	0.0048 U	0.0053 U	0.0048 U	0.0047 U	0.0050 U	0.0049 U
1,2,4,5-Tetrachlorobenzene	mg/Kg			0.0048 U	0.0047 U	0.0052 U	0.0047 U	0.0047 U	0.0052 U	0.0047 U	0.0047 U	0.0052 U	0.0047 U	0.0047 U	0.0049 U	0.0049 U
1,4-Dioxane	mg/Kg	0.1	13	0.010 U	0.0099 U F2	0.011 U	0.010 U	0.0099 U	0.011 U	0.0099 U	0.010 U	0.011 U	0.010 U	0.0098 U	0.010 U	0.010 U
2,2'-oxybis[1-chloropropane]	mg/Kg			0.0066 U	0.0065 U	0.0071 U	0.0066 U	0.0065 U	0.0071 U	0.0065 U	0.0066 U	0.0072 U	0.0065 U	0.0064 U	0.0068 U	0.0067 U F1
2,3,4,6-Tetrachlorophenol	mg/Kg			0.025 U	0.024 U	0.027 U	0.025 U	0.024 U	0.027 U	0.024 U	0.025 U	0.027 U	0.024 U	0.024 U	0.025 U	0.025 U
2,4,5-Trichlorophenol	mg/Kg			0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.012 U	0.012 U
2,4,6-Trichlorophenol	mg/Kg			0.018 U	0.018 U	0.020 U *	0.018 U	0.018 U	0.020 U *	0.018 U *	0.018 U	0.020 U	0.018 U	0.018 U *	0.019 U *	0.019 U *
2,4-Dichlorophenol	mg/Kg			0.0077 U	0.0076 U	0.0083 U *	0.0077 U	0.0076 U	0.0083 U *	0.0076 U *	0.0077 U	0.0084 U	0.0076 U	0.0075 U *	0.0079 U *	0.0078 U *
2,4-Dimethylphenol	mg/Kg			0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.016 U	0.016 U F1
2,4-Dinitrophenol	mg/Kg			0.18 U	0.18 U F1	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U	0.18 U F1
2,4-Dinitrotoluene	mg/Kg			0.018 U	0.018 U	0.020 U	0.018 U	0.018 U	0.020 U	0.018 U	0.018 U	0.020 U	0.018 U	0.018 U	0.019 U	0.019 U
2,6-Dinitrotoluene	mg/Kg			0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.012 U	0.012 U
2-Chloronaphthalene	mg/Kg			0.017 U	0.017 U	0.018 U	0.017 U	0.017 U	0.018 U	0.017 U	0.017 U	0.018 U	0.017 U	0.016 U	0.017 U	0.017 U
2-Chlorophenol	mg/Kg			0.0051 U	0.0050 U F1	0.0055 U	0.0051 U	0.0050 U	0.0055 U	0.0050 U	0.0051 U	0.0056 U	0.0051 U	0.0050 U	0.0052 U	0.0052 U F1
2-Methylnaphthalene	mg/Kg			0.0045 U	0.0045 U	0.0049 U	0.0045 U	0.0045 U	**0.019 J**	0.0045 U	0.0045 U	0.0049 U	0.0045 U	0.0044 U	0.0047 U	0.0046 U F1
2-Methylphenol	mg/Kg	0.33	100	0.0059 U	0.0058 U	0.0064 U	0.0059 U	0.0058 U	0.0064 U	0.0058 U	0.0059 U	0.0064 U	0.0058 U	0.0058 U	0.0060 U	0.0060 U F1
2-Nitroaniline	mg/Kg			0.014 U	0.013 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.014 U	0.015 U	0.014 U	0.013 U	0.014 U	0.014 U
2-Nitrophenol	mg/Kg			0.012 U	0.011 U F1	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.011 U	0.012 U	0.012 U F1
3,3'-Dichlorobenzidine	mg/Kg			0.055 U	0.054 U	0.059 U	0.055 U	0.054 U	0.060 U	0.054 U	0.055 U	0.060 U	0.055 U	0.054 U	0.057 U	0.056 U
3-Nitroaniline	mg/Kg			0.020 U	0.019 U	0.021 U	0.020 U	0.019 U	0.021 U	0.020 U	0.020 U	0.022 U	0.020 U	0.019 U	0.020 U	0.020 U
4,6-Dinitro-2-methylphenol	mg/Kg			0.059 U	0.058 U F1	0.064 U	0.059 U	0.058 U	0.064 U	0.058 U	0.059 U	0.064 U	0.059 U	0.058 U	0.061 U	0.060 U F1
4-Bromophenyl phenyl ether	mg/Kg			0.0047 U	0.0046 U	0.0051 U	0.0047 U	0.0046 U	0.0051 U	0.0047 U	0.0047 U	0.0051 U	0.0047 U	0.0046 U	0.0048 U	0.0048 U
4-Chloro-3-methylphenol	mg/Kg			0.0060 U	0.0060 U	0.0065 U	0.0060 U	0.0060 U	0.0066 U	0.0060 U	0.0060 U	0.0066 U	0.0060 U	0.0059 U	0.0062 U	0.0062 U
4-Chloroaniline	mg/Kg			0.025 U	0.025 U	0.028 U	0.025 U	0.025 U	0.028 U	0.025 U	0.025 U	0.028 U	0.025 U	0.025 U	0.026 U	0.026 U
4-Chlorophenyl phenyl ether	mg/Kg			0.0057 U	0.0056 U	0.0062 U	0.0057 U	0.0057 U	0.0062 U	0.0057 U	0.0057 U	0.0062 U	0.0057 U	0.0056 U	0.0059 U	0.0059 U
4-Methylphenol	mg/Kg	0.33	100	0.0062 U	0.0061 U	0.0067 U	0.0062 U	0.0061 U	0.0067 U	0.0061 U	0.0062 U	0.0068 U	0.0062 U	0.0061 U	0.0064 U	0.0063 U F1
4-Nitroaniline	mg/Kg			0.014 U	0.013 U	0.015 U	0.014 U	0.013 U	0.015 U	0.013 U	0.014 U	0.015 U	0.013 U	0.013 U	0.014 U	0.014 U
4-Nitrophenol	mg/Kg			0.059 U	0.058 U	0.064 U	0.059 U	0.058 U	0.064 U	0.059 U	0.059 U	0.065 U	0.059 U	0.058 U	0.061 U	0.061 U
Acenaphthene	mg/Kg	20	100	0.026 U	0.026 U	0.029 U	0.026 U	0.026 U	**0.033 J**	0.026 U	0.026 U	0.029 U	0.026 U	0.026 U	0.027 U	0.027 U F1
Acenaphthylene	mg/Kg	100	100	0.0038 U	0.0037 U	0.0041 U	0.0038 U	0.0037 U	**0.10 J**	0.0037 U	0.0038 U	0.0041 U	0.0037 U	0.0037 U	0.0039 U	0.0038 U F1
Acetophenone	mg/Kg			0.0059 U	0.0058 U F1	0.0064 U	0.0058 U	0.0058 U	0.0064 U	0.0058 U	0.0059 U	0.0064 U	0.0058 U	0.0057 U	0.0060 U	0.0060 U F1
Anthracene	mg/Kg	100	100	0.0041 U	0.0040 U	**0.048 J**	0.0041 U	0.0040 U	**0.27 J**	0.0040 U	0.0041 U	0.0044 U	0.0040 U	0.0040 U	0.0042 U	0.0042 U F1
Atrazine	mg/Kg			0.0092 U	0.0090 U	0.0099 U	0.0092 U	0.0090 U	0.010 U	0.0091 U	0.0092 U	0.010 U	0.0091 U	0.0090 U	0.0094 U	0.0094 U
Benzaldehyde	mg/Kg			0.016 U	0.016 U F1	0.017 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.016 U	0.016 U F1
Benzo[a]anthracene	mg/Kg	1	1	0.013 U	0.012 U	**0.26**	0.013 U	0.013 U	**2.0**	0.013 U	0.013 U	0.014 U	0.013 U	0.012 U	0.013 U	0.013 U F1
Benzo[a]pyrene	mg/Kg	1	1	0.0097 U	0.0095 U	**0.26**	0.0097 U	0.0095 U	**2.0**	0.0096 U	0.0097 U	0.011 U	0.0096 U	0.0095 U	0.010 U	0.0099 U F1
Benzo[b]fluoranthene	mg/Kg	1	1	0.0094 U	0.0093 U	**0.39**	0.0094 U	0.0093 U	**3.2**	0.0093 U	0.0094 U	0.010 U	0.0094 U	0.0092 U	0.0097 U	0.0096 U
Benzo[g,h,i]perylene	mg/Kg	100	100	0.011 U	0.011 U	**0.18 J**	0.011 U	0.011 U	**1.5**	0.011 U	0.011 U	0.012 U	0.011 U	0.011 U	0.011 U	0.011 U
Benzo[k]fluoranthene	mg/Kg	0.8	3.9	0.0071 U	0.0070 U	**0.12**	0.0071 U	0.0070 U	**1.3**	0.0071 U	0.0071 U	0.0078 U	0.0071 U	0.0070 U	0.0073 U	0.0073 U
Bis(2-chloroethoxy)methane	mg/Kg			0.012 U	0.012 U F1	0.014 U	0.012 U	0.012 U	0.014 U	0.012 U	0.012 U	0.014 U	0.012 U	0.012 U	0.013 U	0.013 U F1
Bis(2-chloroethyl)ether	mg/Kg			0.0044 U	0.0043 U F2 F1	0.0048 U	0.0044 U	0.0043 U	0.0048 U	0.0043 U	0.0044 U	0.0048 U	0.0044 U	0.0043 U	0.0045 U	0.0045 U F1
Bis(2-ethylhexyl) phthalate	mg/Kg			0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.020 U	0.020 U
Butyl benzyl phthalate	mg/Kg			0.017 U	0.017 U	0.018 U	0.017 U	0.017 U	0.019 U	0.017 U	0.017 U	0.019 U	0.017 U	0.017 U	0.018 U	0.017 U
Caprolactam	mg/Kg			0.022 U	0.021 U	0.024 U	0.022 U	0.021 U	0.024 U	0.022 U	0.022 U	0.024 U	0.022 U	0.021 U	0.022 U	0.022 U
Carbazole	mg/Kg			0.0043 U	0.0042 U	**0.028 J**	0.0042 U	0.0042 U	**0.23 J**	0.0042 U	0.0042 U	0.0046 U	0.0042 U	0.0042 U	0.0044 U	0.0043 U F1
Chrysene	mg/Kg	1	3.9	0.0061 U	0.0061 U	**0.29 J**	0.0061 U	0.0061 U	**2.3**	0.0061 U	0.0061 U	0.0067 U	0.0061 U	0.0060 U	0.0063 U	0.0063 U F1
Dibenz(a,h)anthracene	mg/Kg	0.33	0.33	0.016 U	0.015 U	**0.046**	0.016 U	0.016 U	**0.40**	0.016 U	0.016 U	0.017 U	0.016 U	0.015 U	0.016 U	0.016 U
Dibenzofuran	mg/Kg	7	59	0.0051 U	0.0050 U	0.0055 U	0.0051 U	0.0050 U	**0.038 J**	0.0051 U	0.0051 U	0.0056 U	0.0051 U	0.0050 U	0.0053 U	0.0052 U F1
Diethyl phthalate	mg/Kg			0.0053 U	0.0052 U	0.0057 U	0.0053 U	0.0052 U	0.0057 U	0.0052 U	0.0053 U	0.0057 U	0.0052 U	0.0052 U	0.0054 U	0.0054 U
Dimethyl phthalate	mg/Kg			0.0044 U	0.0043 U	0.0048 U	0.0044 U	0.0043 U	0.0048 U	0.0043 U	0.0044 U	0.0048 U	0.0044 U	0.0043 U	0.0045 U	0.0045 U F1
Di-n-butyl phthalate	mg/Kg			0.064 U	0.063 U	0.069 U	0.064 U	0.063 U	0.070 U	0.063 U	0.064 U	0.070 U	0.064 U	0.063 U	0.066 U	0.066 U F1
Di-n-octyl phthalate	mg/Kg			0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.021 U	0.019 U	0.019 U	0.020 U	0.020 U
Fluoranthene	mg/Kg	100	100	0.0047 U	0.0047 U	**0.52**	0.0047 U	0.0047 U	**4.0**	0.0047 U	0.0047 U	0.0051 U	0.0047 U	0.0046 U	0.0049 U	0.0048 U
Fluorene	mg/Kg	30	100	0.0049 U	0.0049 U	0.0053 U	0.0049 U	0.0049 U	**0.047 J**	0.0049 U	0.0049 U	0.0054 U	0.0049 U	0.0048 U	0.0051 U	0.0050 U F1
Hexachlorobenzene	mg/Kg	0.33	1.2	0.0053 U	0.0052 U	0.0058 U	0.0053 U	0.0053 U	0.0058 U	0.0053 U	0.0053 U	0.0058 U	0.0053 U	0.0052 U	0.0055 U	0.0054 U
Hexachlorobutadiene	mg/Kg			0.0077 U	0.0076 U F1	0.0084 U *	0.0077 U	0.0076 U	0.0084 U *	0.0077 U *	0.0077 U	0.0084 U	0.0077 U	0.0076 U *	0.0080 U *	0.0079 U *
Hexachlorocyclopentadiene	mg/Kg			0.032 U	0.031 U F1	0.035 U	0.032 U	0.031 U	0.035 U	0.032 U	0.032 U	0.035 U	0.032 U	0.031 U	0.033 U	0.033 U F1
Hexachloroethane	mg/Kg			0.0056 U	0.0055 U F2 F1	0.0061 U	0.0056 U	0.0055 U	0.0061 U	0.0055 U	0.0056 U	0.0061 U	0.0056 U	0.0055 U	0.0058 U	0.0057 U F1
Indeno[1,2,3-cd]pyrene	mg/Kg	0.5	0.5	0.014 U	0.014 U	**0.20**	0.014 U	0.014 U	**1.6**	0.014 U	0.014 U	0.015 U	0.014 U	0.014 U	0.015 U	0.015 U
Isophorone	mg/Kg			0.0096 U	0.0094 U F1	0.010 U	0.0095 U	0.0094 U	0.010 U	0.0095 U	0.0095 U	0.010 U	0.0095 U	0.0094 U	0.0099 U	0.0098 U F1
Naphthalene	mg/Kg	12	100	0.0063 U	0.0062 U F1	0.0068 U	0.0063 U	0.0062 U	**0.074 J**	0.0062 U	0.0063 U	0.0069 U	0.0062 U	0.0062 U	0.0065 U	0.0064 U F1
Nitrobenzene	mg/Kg			0.0087 U	0.0086 U F1	0.0095 U	0.0087 U	0.0086 U	0.0095 U	0.0086 U	0.0087 U	0.0095 U	0.0087 U	0.0086 U	0.0090 U	0.0089 U F1
N-Nitrosodi-n-propylamine	mg/Kg			0.0058 U	0.0057 U F1	0.0063 U	0.0058 U	0.0057 U	0.0063 U	0.0057 U	0.0058 U	0.0063 U	0.0058 U	0.0057 U	0.0060 U	0.0059 U F1
N-Nitrosodiphenylamine	mg/Kg			0.0070 U	0.0069 U	0.0075 U	0.0069 U	0.0069 U	0.0076 U	0.0069 U	0.0069 U	0.0076 U	0.0069 U	0.0068 U	0.0072 U	0.0071 U
Pentachlorophenol	mg/Kg	0.8	6.7	0.074 U	0.073 U F1	0.081 U	0.074 U	0.073 U	0.081 U	0.074 U	0.074 U	0.081 U	0.074 U	0.073 U	0.077 U	0.076 U F1
Phenanthrene	mg/Kg	100	100	0.0064 U	0.0063 U	**0.30 J**	0.0064 U	0.0063 U	**1.5**	0.0063 U	0.0064 U	0.0070 U	0.0064 U	0.0063 U	0.0066 U	0.0065 U F1
Phenol	mg/Kg	0.33	100	0.0054 U	0.0053 U	0.0058 U	0.0054 U	0.0053 U	0.0059 U	0.0053 U	0.0054 U	0.0059 U	0.0054 U	0.0053 U	0.0055 U	0.0055 U F1
Pyrene	mg/Kg	100	100	0.0090 U	0.0089 U	**0.53**	0.0090 U	0.0089 U	**4.0**	0.0089 U	0.0090 U	0.0099 U	0.0090 U	0.0089 U	0.0093 U	0.0092 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1B
Summary of Soil Sampling Results
Semi Volatile Organic Compounds (8270)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-7 S-21 (3-3.5) 5/8/2019 8:40 AM	460-181467-8 S-21 (8-8.5) 5/8/2019 8:45 AM	460-181467-9 S-21 (14-14.5) 5/8/2019 8:55 AM	460-181467-16 S-22 (1.5-2) 5/8/2019 10:00 AM	460-181467-17 S-22 (5.5-6) 5/8/2019 10:05 AM	460-181467-18 S-22 (10.5-11) 5/8/2019 10:10 AM	460-181467-4 S-23 (4-4.5) 5/8/2019 8:15 AM	460-181467-5 S-23 (9-9.5) 5/8/2019 8:20 AM	460-181467-6 S-23 (13.5-14) 5/8/2019 8:30 AM	460-181391-29 S-24 (4.5-5) 5/7/2019 12:50 PM	460-181391-4 S-24(9 -9.5) 5/7/2019 1:00 PM	460-181391-35 S-24 (14.5-15) 5/7/2019 1:05 PM
SOIL BY 8270D															
1,1'-Biphenyl	mg/Kg			0.0057 U	0.0048 U	0.0048 U	0.0052 U F1 F2	0.0048 U	0.0049 U	0.0049 U	0.0048 U	0.0048 U	0.0049 U	0.0048 U	0.0047 U
1,2,4,5-Tetrachlorobenzene	mg/Kg			0.0056 U	0.0047 U	0.0047 U	0.0052 U F1 F2	0.0048 U	0.0048 U	0.0048 U	0.0047 U	0.0047 U	0.0047 U	0.0048 U	0.0047 U
1,4-Dioxane	mg/Kg	0.1	13	0.012 U	0.0099 U	0.0099 U	0.011 U F1 F2	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.0098 U
2,2'-oxybis[1-chloropropane]	mg/Kg			0.0078 U	0.0065 U	0.0065 U	0.0072 U F1 F2	0.0066 U	0.0066 U	0.0067 U	0.0065 U	0.0066 U	0.0067 U	0.0065 U	0.0065 U
2,3,4,6-Tetrachlorophenol	mg/Kg			0.029 U	0.024 U	0.024 U	0.027 U F1	0.025 U	0.025 U	0.025 U	0.024 U	0.025 U	0.025 U	0.024 U	0.024 U
2,4,5-Trichlorophenol	mg/Kg			0.014 U	0.012 U	0.012 U	0.013 U F1	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
2,4,6-Trichlorophenol	mg/Kg			0.022 U	0.018 U	0.018 U	0.020 U F1 F2	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U *	0.018 U	0.018 U *
2,4-Dichlorophenol	mg/Kg			0.0091 U	0.0076 U	0.0076 U	0.0083 U F1 F2	0.0077 U	0.0077 U	0.0078 U	0.0076 U	0.0077 U	0.0078 U *	0.0076 U	0.0075 U *
2,4-Dimethylphenol	mg/Kg			0.019 U	0.016 U	0.016 U	0.017 U F1 F2	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
2,4-Dinitrophenol	mg/Kg			0.21 U	0.18 U	0.18 U	0.19 U F1 F2	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U
2,4-Dinitrotoluene	mg/Kg			0.022 U	0.018 U	0.018 U	0.020 U F1	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U
2,6-Dinitrotoluene	mg/Kg			0.014 U	0.012 U	0.012 U	0.013 U F1	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
2-Chloronaphthalene	mg/Kg			0.020 U	0.017 U	0.017 U	0.018 U F1 F2	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U
2-Chlorophenol	mg/Kg			0.0060 U	0.0050 U	0.0050 U	0.0055 U F1 F2	0.0051 U	0.0051 U	0.0052 U	0.0051 U	0.0051 U	0.0052 U	0.0050 U	0.0050 U
2-Methylnaphthalene	mg/Kg			0.0054 U	0.0045 U	0.0045 U	0.0049 U F1 F2	0.0046 U	0.0046 U	0.0046 U	0.0045 U	0.0045 U	**0.0095 J**	0.0045 U	0.0045 U
2-Methylphenol	mg/Kg	0.33	100	0.0070 U	0.0058 U	0.0058 U	0.0064 U F1 F2	0.0059 U	0.0059 U	0.0059 U	0.0058 U	0.0058 U	0.0060 U	0.0058 U	0.0058 U
2-Nitroaniline	mg/Kg			0.016 U	0.013 U	0.013 U	0.015 U F1 F2	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.013 U	0.013 U
2-Nitrophenol	mg/Kg			0.014 U	0.011 U	0.012 U	0.013 U F1 F2	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 U
3,3'-Dichlorobenzidine	mg/Kg			0.065 U	0.054 U	0.054 U	0.060 U	0.055 U	0.055 U	0.056 U	0.055 U	0.055 U	0.056 U	0.054 U	0.054 U
3-Nitroaniline	mg/Kg			0.023 U	0.019 U	0.020 U	0.021 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.019 U	0.019 U
4,6-Dinitro-2-methylphenol	mg/Kg			0.070 U	0.058 U	0.058 U	0.064 U F1 F2	0.059 U	0.059 U	0.060 U	0.059 U	0.059 U	0.060 U	0.058 U	0.058 U
4-Bromophenyl phenyl ether	mg/Kg			0.0056 U	0.0046 U	0.0047 U	0.0051 U F1	0.0047 U	0.0047 U	0.0048 U	0.0047 U	0.0047 U	0.0048 U	0.0046 U	0.0046 U
4-Chloro-3-methylphenol	mg/Kg			0.0072 U	0.0059 U	0.0060 U	0.0066 U F1 F2	0.0061 U	0.0061 U	0.0061 U	0.0060 U	0.0060 U	0.0062 U	0.0060 U	0.0059 U
4-Chloroaniline	mg/Kg			0.030 U	0.025 U	0.025 U	0.028 U F2	0.026 U	0.026 U	0.026 U	0.025 U	0.025 U	0.026 U	0.025 U	0.025 U
4-Chlorophenyl phenyl ether	mg/Kg			0.0068 U	0.0056 U	0.0057 U	0.0062 U F1 F2	0.0058 U	0.0058 U	0.0058 U	0.0057 U	0.0057 U	0.0058 U	0.0057 U	0.0056 U
4-Methylphenol	mg/Kg	0.33	100	0.0073 U	0.0061 U	0.0061 U	0.0067 U F1 F2	0.0062 U	0.0062 U	0.0063 U	0.0062 U	0.0062 U	0.0063 U	0.0061 U	0.0061 U
4-Nitroaniline	mg/Kg			0.016 U	0.013 U	0.013 U	0.015 U F1	0.014 U	0.014 U	0.014 U	0.013 U	0.014 U	0.014 U	0.013 U	0.013 U
4-Nitrophenol	mg/Kg			0.070 U	0.058 U	0.059 U	0.064 U	0.059 U	0.060 U	0.060 U	0.059 U	0.059 U	0.060 U	0.059 U	0.058 U
Acenaphthene	mg/Kg	20	100	0.031 U	0.026 U	0.026 U	0.029 U F1 F2	0.027 U	0.027 U	0.027 U	0.026 U	0.026 U	0.027 U	0.026 U	0.026 U
Acenaphthylene	mg/Kg	100	100	**0.022 J**	0.0037 U	0.0037 U	0.0041 U F1 F2	0.0038 U	0.0038 U	0.0038 U	0.0037 U	0.0037 U	0.0038 U	0.0037 U	0.0037 U
Acetophenone	mg/Kg			0.0070 U	0.0058 U	0.0058 U	0.0064 U F1 F2	0.0059 U	0.0059 U	0.0059 U	0.0058 U	0.0058 U	0.0060 U	0.0058 U	0.0058 U
Anthracene	mg/Kg	100	100	**0.033 J**	0.0040 U	0.0040 U	0.0044 U F1	0.0041 U	0.0041 U	0.0041 U	0.0040 U	0.0041 U	0.0041 U	0.0040 U	0.0040 U
Atrazine	mg/Kg			0.011 U	0.0090 U	0.0091 U	0.010 U F1	0.0092 U	0.0092 U	0.0093 U	0.0091 U	0.0091 U	0.0093 U	0.0091 U	0.0090 U
Benzaldehyde	mg/Kg			0.019 U	0.016 U	0.016 U	0.017 U F1 F2	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U
Benzo[a]anthracene	mg/Kg	1	1	**0.22**	0.012 U	0.013 U	**0.087 F1**	**0.030 J**	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.012 U
Benzo[a]pyrene	mg/Kg	1	1	**0.21**	0.0095 U	0.0096 U	**0.055 F1**	**0.020 J**	0.0097 U	0.0098 U	0.0096 U	0.0097 U	0.0099 U	0.0096 U	0.0095 U
Benzo[b]fluoranthene	mg/Kg	1	1	**0.31**	0.0093 U	0.0093 U	**0.085 F1**	**0.030 J**	0.0095 U	0.0095 U	0.0093 U	0.0094 U	0.0096 U	0.0093 U	0.0092 U
Benzo[g,h,i]perylene	mg/Kg	100	100	**0.15 J**	0.011 U	0.011 U	**0.034 J F1**	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U	0.011 U
Benzo[k]fluoranthene	mg/Kg	0.8	3.9	**0.11**	0.0070 U	0.0071 U	**0.042 F1**	0.0072 U	0.0072 U	0.0072 U	0.0071 U	0.0071 U	0.0073 U	0.0070 U	0.0070 U
Bis(2-chloroethoxy)methane	mg/Kg			0.015 U	0.012 U	0.012 U	0.014 U F1 F2	0.013 U	0.013 U	0.013 U	0.012 U	0.012 U	0.013 U	0.012 U	0.012 U
Bis(2-chloroethyl)ether	mg/Kg			0.0052 U	0.0043 U	0.0044 U	0.0048 U F1 F2	0.0044 U	0.0044 U	0.0045 U	0.0044 U	0.0044 U	0.0045 U	0.0043 U	0.0043 U
Bis(2-ethylhexyl) phthalate	mg/Kg			0.023 U	0.019 U	0.019 U	**0.39 F2**	**0.073 J**	0.019 U	0.019 U	0.019 U	0.019 U	0.020 U	0.019 U	0.019 U
Butyl benzyl phthalate	mg/Kg			0.020 U	0.017 U	0.017 U	0.019 U F1	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U
Caprolactam	mg/Kg			0.026 U	0.021 U	0.022 U	0.024 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.021 U
Carbazole	mg/Kg			0.0050 U	0.0042 U	0.0042 U	0.0046 U F1	0.0043 U	0.0043 U	0.0043 U	0.0042 U	0.0042 U	0.0043 U	0.0042 U	0.0042 U
Chrysene	mg/Kg	1	3.9	**0.25 J**	0.0060 U	0.0061 U	**0.077 J F1**	**0.028 J**	0.0062 U	0.0062 U	0.0061 U	0.0061 U	0.0063 U	0.0061 U	0.0060 U
Dibenz(a,h)anthracene	mg/Kg	0.33	0.33	**0.024 J**	0.015 U	0.016 U	0.017 U F1	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.015 U
Dibenzofuran	mg/Kg	7	59	0.0061 U	0.0050 U	0.0051 U	0.0056 U F1 F2	0.0051 U	0.0051 U	0.0052 U	0.0051 U	0.0051 U	0.0052 U	0.0050 U	0.0050 U
Diethyl phthalate	mg/Kg			0.0062 U	0.0052 U	0.0052 U	0.0057 U F1	0.0053 U	0.0053 U	0.0053 U	0.0052 U	0.0053 U	0.0054 U	0.0052 U	0.0052 U
Dimethyl phthalate	mg/Kg			0.0052 U	0.0043 U	0.0043 U	0.0048 U F1	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0045 U	0.0043 U	0.0043 U
Di-n-butyl phthalate	mg/Kg			0.076 U	0.063 U	0.064 U	0.070 U F1	0.064 U	0.064 U	0.065 U	0.064 U	0.064 U	0.065 U	0.063 U	0.063 U
Di-n-octyl phthalate	mg/Kg			0.023 U	0.019 U	0.019 U	0.021 U F1	0.019 U	0.019 U	0.020 U	0.019 U	0.019 U	0.020 U	0.019 U	0.019 U
Fluoranthene	mg/Kg	100	100	**0.38 J**	0.0046 U	0.0047 U	**0.14 J F1**	**0.040 J**	0.0047 U	0.0048 U	0.0047 U	0.0047 U	0.0048 U	0.0047 U	0.0046 U
Fluorene	mg/Kg	30	100	0.0059 U	0.0049 U	0.0049 U	0.0054 U F1 F2	0.0050 U	0.0050 U	0.0050 U	0.0049 U	0.0049 U	0.0050 U	0.0049 U	0.0048 U
Hexachlorobenzene	mg/Kg	0.33	1.2	0.0063 U	0.0052 U	0.0053 U	0.0058 U F1	0.0054 U	0.0054 U	0.0054 U	0.0053 U	0.0053 U	0.0054 U	0.0053 U	0.0052 U
Hexachlorobutadiene	mg/Kg			0.0092 U	0.0076 U	0.0077 U	0.0084 U F1 F2	0.0078 U	0.0078 U	0.0078 U	0.0077 U	0.0077 U	0.0079 U *	0.0076 U	0.0076 U *
Hexachlorocyclopentadiene	mg/Kg			0.038 U	0.031 U	0.032 U	0.035 U F1 F2	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.032 U	0.031 U
Hexachloroethane	mg/Kg			0.0067 U	0.0055 U	0.0056 U	0.0061 U F1 F2	0.0056 U	0.0056 U	0.0057 U	0.0056 U	0.0056 U	0.0057 U	0.0055 U	0.0055 U
Indeno[1,2,3-cd]pyrene	mg/Kg	0.5	0.5	**0.17**	0.014 U	0.014 U	**0.047**	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
Isophorone	mg/Kg			0.011 U	0.0094 U	0.0095 U	0.010 U F1 F2	0.0096 U	0.0096 U	0.0097 U	0.0095 U	0.0095 U	0.0097 U	0.0094 U	0.0094 U
Naphthalene	mg/Kg	12	100	0.0075 U	0.0062 U	0.0062 U	0.0068 U F1 F2	0.0063 U	0.0063 U	0.0064 U	0.0062 U	0.0063 U	**0.028 J**	0.0062 U	0.0062 U
Nitrobenzene	mg/Kg			0.010 U	0.0086 U	0.0086 U	0.0095 U F1 F2	0.0088 U	0.0088 U	0.0089 U	0.0087 U	0.0087 U	0.0089 U	0.0086 U	0.0086 U
N-Nitrosodi-n-propylamine	mg/Kg			0.0069 U	0.0057 U	0.0057 U	0.0063 U F1 F2	0.0058 U	0.0058 U	0.0059 U	0.0058 U	0.0058 U	0.0059 U	0.0057 U	0.0057 U
N-Nitrosodiphenylamine	mg/Kg			0.0083 U	0.0068 U	0.0069 U	0.0076 U F1	0.0070 U	0.0070 U	0.0071 U	0.0069 U	0.0069 U	0.0071 U	0.0069 U	0.0068 U
Pentachlorophenol	mg/Kg	0.8	6.7	0.088 U	0.073 U	0.074 U	0.081 U F1	0.075 U	0.075 U	0.076 U	0.074 U	0.074 U	0.076 U	0.074 U	0.073 U
Phenanthrene	mg/Kg	100	100	**0.14 J**	0.0063 U	0.0063 U	**0.091 J F1 F2**	**0.024 J**	0.0064 U	0.0065 U	0.0063 U	0.0064 U	0.0065 U	0.0063 U	0.0063 U
Phenol	mg/Kg	0.33	100	0.0064 U	0.0053 U	0.0053 U	0.0059 U F1 F2	0.0054 U	0.0054 U	0.0055 U	0.0054 U	0.0054 U	0.0055 U	0.0053 U	0.0053 U
Pyrene	mg/Kg	100	100	**0.39 J**	0.0089 U	0.0090 U	**0.13 J F1**	**0.043 J**	0.0091 U	0.0092 U	0.0090 U	0.0090 U	0.0092 U	0.0089 U	0.0089 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1B
Summary of Soil Sampling Results
Semi Volatile Organic Compounds (8270)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-1 S-25 (2.5-3) 5/8/2019 7:45 AM	460-181467-2 S-25 (6.5-7) 5/8/2019 8:00 AM	460-181467-3 S-25 (12-12.5) 5/8/2019 8:10 AM	460-181391-11 S-26 (3-3.5) 5/7/2019 1:25 PM	460-181391-20 S-26 (8-8.5) 5/7/2019 1:36 PM	460-181391-37 S-26 (13-13.5) 5/7/2019 1:35 PM	460-181391-12 S-26 (18.5-19) 5/7/2019 1:50 PM	460-181391-13 S-26 (22.5-23) 5/7/2019 2:00 PM
SOIL BY 8270D											
1,1'-Biphenyl	mg/Kg			0.0053 U	0.0049 U	0.0049 U	0.0050 U	0.0048 U	0.0048 U	0.0047 U	0.0047 U
1,2,4,5-Tetrachlorobenzene	mg/Kg			0.0053 U	0.0048 U	0.0048 U	0.0049 U	0.0047 U	0.0048 U	0.0046 U	0.0046 U
1,4-Dioxane	mg/Kg	0.1	13	0.011 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.010 U	0.0097 U	0.0098 U
2,2'-oxybis[1-chloropropane]	mg/Kg			0.0073 U	0.0066 U	0.0067 U	0.0068 U	0.0065 U	0.0066 U	0.0064 U	0.0064 U
2,3,4,6-Tetrachlorophenol	mg/Kg			0.027 U	0.025 U	0.025 U	0.026 U	0.024 U	0.025 U	0.024 U	0.024 U
2,4,5-Trichlorophenol	mg/Kg			0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
2,4,6-Trichlorophenol	mg/Kg			0.020 U	0.018 U	0.019 U	0.019 U	0.018 U	0.018 U *	0.018 U	0.018 U
2,4-Dichlorophenol	mg/Kg			0.0085 U	0.0077 U	0.0078 U	0.0080 U	0.0076 U	0.0077 U *	0.0074 U	0.0075 U
2,4-Dimethylphenol	mg/Kg			0.018 U	0.016 U	0.016 U	0.017 U	0.016 U	0.016 U	0.016 U	0.016 U
2,4-Dinitrophenol	mg/Kg			0.20 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.17 U	0.17 U
2,4-Dinitrotoluene	mg/Kg			0.020 U	0.019 U	0.019 U	0.019 U	0.018 U	0.018 U	0.018 U	0.018 U
2,6-Dinitrotoluene	mg/Kg			0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 U	0.012 U
2-Chloronaphthalene	mg/Kg			0.019 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.016 U	0.016 U
2-Chlorophenol	mg/Kg			0.0056 U	0.0051 U	0.0052 U	0.0053 U	0.0050 U	0.0051 U	0.0049 U	0.0050 U
2-Methylnaphthalene	mg/Kg			**0.037 J**	0.0046 U	0.0046 U	0.0047 U	0.0045 U	0.0046 U	0.0044 U	0.0044 U
2-Methylphenol	mg/Kg	0.33	100	0.0065 U	0.0059 U	0.0060 U	0.0061 U	0.0058 U	0.0059 U	0.0057 U	0.0057 U
2-Nitroaniline	mg/Kg			0.015 U	0.014 U	0.014 U	0.014 U	0.013 U	0.014 U	0.013 U	0.013 U
2-Nitrophenol	mg/Kg			0.013 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.011 U	0.011 U
3,3'-Dichlorobenzidine	mg/Kg			0.061 U	0.055 U	0.056 U	0.057 U	0.054 U	0.055 U	0.053 U	0.054 U
3-Nitroaniline	mg/Kg			0.022 U	0.020 U	0.020 U	0.021 U	0.020 U	0.020 U	0.019 U	0.019 U
4,6-Dinitro-2-methylphenol	mg/Kg			0.065 U	0.059 U	0.060 U	0.061 U	0.058 U	0.059 U	0.057 U	0.058 U
4-Bromophenyl phenyl ether	mg/Kg			0.0052 U	0.0047 U	0.0048 U	0.0049 U	0.0047 U	0.0047 U	0.0046 U	0.0046 U
4-Chloro-3-methylphenol	mg/Kg			0.0067 U	0.0061 U	0.0062 U	0.0063 U	0.0060 U	0.0061 U	0.0059 U	0.0059 U
4-Chloroaniline	mg/Kg			0.028 U	0.026 U	0.026 U	0.026 U	0.025 U	0.026 U	0.025 U	0.025 U
4-Chlorophenyl phenyl ether	mg/Kg			0.0063 U	0.0058 U	0.0058 U	0.0060 U	0.0057 U	0.0057 U	0.0056 U	0.0056 U
4-Methylphenol	mg/Kg	0.33	100	**0.019 J**	0.0062 U	0.0063 U	0.0064 U	0.0061 U	0.0062 U	0.0060 U	0.0061 U
4-Nitroaniline	mg/Kg			**0.033 J**	0.014 U	0.014 U	0.014 U	0.013 U	0.014 U	0.013 U	0.013 U
4-Nitrophenol	mg/Kg			0.066 U	0.060 U	0.060 U	0.062 U	0.059 U	0.059 U	0.057 U	0.058 U
Acenaphthene	mg/Kg	20	100	**0.043 J**	0.027 U	0.027 U	0.028 U	0.026 U	0.027 U	0.026 U	0.026 U
Acenaphthylene	mg/Kg	100	100	**0.21 J**	0.0038 U	**0.037 J**	0.0039 U	0.0037 U	0.0038 U	0.0036 U	0.0037 U
Acetophenone	mg/Kg			0.0065 U	0.0059 U	0.0060 U	0.0061 U	0.0058 U	0.0059 U	0.0057 U	0.0057 U
Anthracene	mg/Kg	100	100	**0.21 J**	0.0041 U	**0.10 J**	0.0042 U	0.0040 U	0.0041 U	0.0039 U	0.0040 U
Atrazine	mg/Kg			0.010 U	0.0092 U	0.0093 U	0.0095 U	0.0091 U	0.0092 U	0.0089 U	0.0090 U
Benzaldehyde	mg/Kg			0.018 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.015 U	0.015 U
Benzo[a]anthracene	mg/Kg	1	1	**1.0**	0.013 U	**0.22**	0.013 U	0.013 U	0.013 U	0.012 U	0.012 U
Benzo[a]pyrene	mg/Kg	1	1	**1.2**	0.0098 U	**0.17**	0.010 U	0.0096 U	0.0097 U	0.0094 U	0.0095 U
Benzo[b]fluoranthene	mg/Kg	1	1	**1.9**	0.0095 U	**0.24**	0.0098 U	0.0093 U	0.0094 U	0.0091 U	0.0092 U
Benzo[g,h,i]perylene	mg/Kg	100	100	**0.92**	0.011 U	**0.074 J**	0.011 U	0.011 U	0.011 U	0.010 U	0.010 U
Benzo[k]fluoranthene	mg/Kg	0.8	3.9	**0.63**	0.0072 U	**0.091**	0.0074 U	0.0071 U	0.0071 U	0.0069 U	0.0070 U
Bis(2-chloroethoxy)methane	mg/Kg			0.014 U	0.013 U	0.013 U	0.013 U	0.012 U	0.013 U	0.012 U	0.012 U
Bis(2-chloroethyl)ether	mg/Kg			0.0049 U	0.0044 U	0.0045 U	0.0046 U	0.0043 U	0.0044 U	0.0043 U	0.0043 U
Bis(2-ethylhexyl) phthalate	mg/Kg			0.021 U	0.019 U	0.020 U	0.020 U	0.019 U	0.019 U	0.019 U	0.019 U
Butyl benzyl phthalate	mg/Kg			0.019 U	0.017 U	0.017 U	0.018 U	0.017 U	0.017 U	0.017 U	0.017 U
Caprolactam	mg/Kg			0.024 U	0.022 U	0.022 U	0.023 U	0.022 U	0.022 U	0.021 U	0.021 U
Carbazole	mg/Kg			**0.24 J**	0.0043 U	0.0043 U	0.0044 U	0.0042 U	0.0043 U	0.0041 U	0.0042 U
Chrysene	mg/Kg	1	3.9	**1.2**	0.0062 U	**0.22 J**	0.0064 U	0.0061 U	0.0062 U	0.0060 U	0.0060 U
Dibenz(a,h)anthracene	mg/Kg	0.33	0.33	**0.17**	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	0.015 U	0.015 U
Dibenzofuran	mg/Kg	7	59	**0.089 J**	0.0051 U	0.0052 U	0.0053 U	0.0051 U	0.0051 U	0.0050 U	0.0050 U
Diethyl phthalate	mg/Kg			0.0058 U	0.0053 U	0.0054 U	0.0055 U	0.0052 U	0.0053 U	0.0051 U	0.0051 U
Dimethyl phthalate	mg/Kg			0.0049 U	0.0044 U	0.0045 U	0.0046 U	0.0043 U	0.0044 U	0.0043 U	0.0043 U
Di-n-butyl phthalate	mg/Kg			0.071 U	0.065 U	0.065 U	0.067 U	0.063 U	0.064 U	0.062 U	0.063 U
Di-n-octyl phthalate	mg/Kg			0.021 U	0.019 U	0.020 U	0.020 U	0.019 U	0.019 U	0.019 U	0.019 U
Fluoranthene	mg/Kg	100	100	**2.4**	0.0048 U	**0.46**	0.0049 U	0.0047 U	0.0047 U	0.0046 U	0.0046 U
Fluorene	mg/Kg	30	100	**0.082 J**	0.0050 U	0.0050 U	0.0051 U	0.0049 U	0.0049 U	0.0048 U	0.0048 U
Hexachlorobenzene	mg/Kg	0.33	1.2	0.0059 U	0.0054 U	0.0054 U	0.0055 U	0.0053 U	0.0053 U	0.0052 U	0.0052 U
Hexachlorobutadiene	mg/Kg			0.0086 U	0.0078 U	0.0079 U	0.0080 U	0.0077 U	0.0078 U *	0.0075 U	0.0076 U
Hexachlorocyclopentadiene	mg/Kg			0.035 U	0.032 U	0.032 U	0.033 U	0.032 U	0.032 U	0.031 U	0.031 U
Hexachloroethane	mg/Kg			0.0062 U	0.0057 U	0.0057 U	0.0058 U	0.0055 U	0.0056 U	0.0054 U	0.0055 U
Indeno[1,2,3-cd]pyrene	mg/Kg	0.5	0.5	**1.1**	0.014 U	**0.10**	0.015 U	0.014 U	0.014 U	0.014 U	0.014 U
Isophorone	mg/Kg			0.011 U	0.0096 U	0.0097 U	0.0099 U	0.0095 U	0.0096 U	0.0093 U	0.0093 U
Naphthalene	mg/Kg	12	100	**0.083 J**	0.0063 U	0.0064 U	0.0065 U	0.0062 U	0.0063 U	0.0061 U	0.0061 U
Nitrobenzene	mg/Kg			0.0097 U	0.0088 U	0.0089 U	0.0091 U	0.0086 U	0.0088 U	0.0085 U	0.0085 U
N-Nitrosodi-n-propylamine	mg/Kg			0.0064 U	0.0058 U	0.0059 U	0.0060 U	0.0057 U	0.0058 U	0.0056 U	0.0057 U
N-Nitrosodiphenylamine	mg/Kg			0.0077 U	0.0070 U	0.0071 U	0.0072 U	0.0069 U	0.0070 U	0.0067 U	0.0068 U
Pentachlorophenol	mg/Kg	0.8	6.7	0.083 U	0.075 U	0.076 U	0.077 U	0.074 U	0.075 U	0.072 U	0.073 U
Phenanthrene	mg/Kg	100	100	**1.6**	0.0064 U	**0.29 J**	0.0066 U	0.0063 U	0.0064 U	0.0062 U	0.0062 U
Phenol	mg/Kg	0.33	100	0.0060 U	0.0054 U	0.0055 U	0.0056 U	0.0053 U	0.0054 U	0.0052 U	0.0053 U
Pyrene	mg/Kg	100	100	**2.1**	0.0091 U	**0.33 J**	0.0094 U	0.0089 U	0.0091 U	0.0088 U	0.0088 U

Notes:

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Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

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Table 1C
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Metals (9012, 7470, 6010)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-19 S-9 (2.5-3) 5/8/2019 10:45 AM	460-181467-20 S-9 (8-8.5) 5/8/2019 10:50 AM	460-181467-21 S-9 (14.5-15) 5/8/2019 10:55 AM	460-181467-22 S-9 (17.5-18) 5/8/2019 11:15 AM	460-181467-23 S-9 (23.5-24) 5/8/2019 11:20 AM	460-181467-13 S-10 (4-4.5) 5/8/2019 9:35 AM	460-181467-14 S-10 (8.5-9) 5/8/2019 9:40 AM	460-181467-15 S-10 (11.5-12) 5/8/2019 9:50 AM	460-181467-10 S-11 (2.2-2.5) 5/8/2019 9:15 AM	460-181467-11 S-11 (6.5-7) 5/8/2019 9:20 AM	460-181467-12 S-11 (13-13.5) 5/8/2019 9:30 AM	460-181391-32 S-12 (2-2.5) 5/7/2019 10:00 AM	460-181391-23 S-12 (6.5-7) 5/7/2019 10:15 AM	460-181391-24 S-12 (11-11.5) 5/7/2019 10:20 AM	460-181391-31 S-13 (2-2.5) 5/7/2019 9:30 AM	460-181391-8 S-13 (8-8.5) 5/7/2019 9:40 AM
Aluminum	mg/Kg			12200	8830	4540	5280	8080	14100	9180	7270	10500	10500	7980	10800	11400	9280	16100	10400
Antimony	mg/Kg			1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U F1	1.1 U	6.7	1.2 U	1.1 U	0.94 U	0.90 U	0.92 U	1.0 U	0.90 U
Arsenic	mg/Kg	13	16	8.6	2.0 J	1.2 U	1.3 U	1.3 J	2.7 J	2.7 J	1.6 J	13.7	1.9 J	1.9 J	4.3	3.0	4.0	8.1	2.2 J
Barium	mg/Kg	350	400	259	61.1	41.3 J	51.0	96.2	108	73.1	58.9	226	98.0	69.5	72.0	89.5	396	81.5	66.8
Beryllium	mg/Kg	7.2	72	0.47	0.27 J	0.14 J	0.15 J	0.12 J	0.52	0.33 J	0.16 J	0.43 J	0.28 J	0.21 J	0.31 J	0.30 J	0.20 J	0.67	0.27 J
Cadmium	mg/Kg	2.5	4.3	0.16 J	0.14 U	0.14 U	0.15 U	0.14 U	0.14 U	0.15 U	0.14 U	1.3	0.15 U	0.14 U	0.64 J	7.6	22.9	0.21 J	0.12 U
Calcium	mg/Kg			7490	734 J	1280	5530	9640	716 J	1330	1260	13200	1290	2220	6570	1260	17700	2190	921
Chromium	mg/Kg			23.9	17.7	11.1	13.5	24.6	21.4	19.3	15.6	56.2	24.1	37.2	19.4	33.1	87.2	24.1	25.1
Cobalt	mg/Kg			8.3 J	6.1 J	4.0 J	4.5 J	6.9 J	7.3 J	7.7 J	5.9 J	11.0 J	8.3 J	8.4 J	7.1 J	6.5 J	6.8 J	7.5 J	5.6 J
Copper	mg/Kg	50	270	38.5	12.7	9.4	8.7	15.1	19.3	14.8	15.3	143	16.7	19.5	30.2	24.9	25.8	16.8	15.3
Cyanide, Total	mg/Kg	27	27	0.64	0.11 U	0.12 U F1	0.12 U	0.11 U	0.11 U	0.10 U	0.12 U	0.12 U	0.12 U F1	0.12 U	3.7	11.6	5.8	0.13 U	0.12 U
Iron	mg/Kg			18100	14900	8950	10000	15300	19400	17400	13400	70700	17900	16000	17500	17500	15400	20600	18200
Lead	mg/Kg	63	400	701	4.3	2.5	2.4	3.1	4.8	4.9	3.3	1230	4.6	4.2	79.7	6.1	801	47.1	4.5
Magnesium	mg/Kg			2750	2110	1970	4030	6570	3220	3360	2380	5410	3320	4130	3520	3140	5290	3420	2850
Manganese	mg/Kg	1600	2000	367	484	97.9	146	178	655	622	281	535	450	249	330	412	413	502	326
Mercury	mg/Kg	0.18	0.81	3.8	0.011 U	0.011 U	0.010 U	0.0096 U	0.011 U	0.011 U	0.0096 U	5.0	0.011 U	0.011 U	0.50	0.010 U	0.17	0.12	0.013 J
Nickel	mg/Kg	30	310	15.7	14.4	9.4	11.9	16.6	18.2	18.7	12.0	46.6	16.2	20.2	19.8	39.0	49.2	15.5	13.5
Potassium	mg/Kg			1370	2090	1880	1940	4450	3210	2580	2440	1180	3210	2830	1700	3520	3470	885 J	2740
Selenium	mg/Kg	3.9	180	2.5 U	2.5 U	2.5 U	2.6 U	2.4 U	2.5 U	2.6 U	2.5 U	2.8 U	2.6 U	2.5 U	2.1 U	2.0 U	2.1 U	2.4 U	2.0 U
Silver	mg/Kg	2	180	0.31 J	0.20 U	0.20 U	0.20 U	0.19 U	0.20 U	0.21 U	0.19 U	0.53 J	0.21 U	0.20 U	0.17 U	0.16 U	0.16 U	0.21 J	0.16 U
Sodium	mg/Kg			1080	663 J	229 J	397 J	178 J	114 J	104 J	107 J	199 J	123 J	178 J	579 J	113 J	231 J	991	321 J
Thallium	mg/Kg			0.66 U	0.68 U	0.66 U	0.68 U	0.64 U	0.67 U	0.69 U	0.66 U	0.75 U	0.70 U	0.68 U	0.57 U	0.54 U	0.55 U	0.63 U	0.54 U
Vanadium	mg/Kg			28.3	19.7	12.5	15.7	26.7	27.5	23.3	19.3	29.3	27.4	22.8	36.5	27.2	28.4	33.1	27.4
Zinc	mg/Kg	109		425	25.6	18.2	19.2	32.4	33.8	30.2	25.2	706	33.0	35.2	84.2	301	587	60.9	28.7

Notes:

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Detections above the Restricted Residential Soil Cleanup Objective

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Table 1C
Summary of Soil Sampling Results
Metals (9012, 7470, 6010)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-14 S-13 (11.5-12) 5/7/2019 9:50 AM	460-181391-28 S-14 (4-4.5) 5/7/2019 9:15 AM	460-181391-33 S-14 (9-9.5) 5/7/2019 9:16 AM	460-181391-3 S-14 (10.5-11) 5/7/2019 9:25 AM	460-181391-1 S-15 (2-2.5) 5/7/2019 8:55 AM	460-181391-30 S-15 (8-8.5) 5/7/2019 9:00 AM	460-181391-2 S-15 (11-11.5) 5/7/2019 9:10 AM	460-181391-19 S-16 (3-3.5) 5/7/2019 8:25 AM	460-181391-6 S-16 (7-7.5) 5/7/2019 8:40 AM	460-181391-7 S-16 (11.5-12) 5/7/2019 8:50 AM	460-181391-26 S-17 (3-3.5) 5/7/2019 11:25 AM	460-181391-18 S-17 (7-7.5) 5/7/2019 11:35 AM	460-181391-9 S-17 (13.5-14) 5/7/2019 11:45 AM	460-181391-27 S-18 (2-2.5) 5/7/2019 11:50 AM	460-181391-16 S-18 (6-6.5) 5/7/2019 12:00 PM
Aluminum	mg/Kg			**8570**	**8870**	**8680**	**9210**	**9440**	**10400**	**12100**	**9100**	**10500**	**7010**	**15500**	**10100**	**6380**	**15600**	**11500**
Antimony	mg/Kg			0.86 U	0.85 U	0.88 U	0.93 U F1	0.86 U	0.85 U	0.96 U	**0.92 U**	**0.82 U**	**0.87 U**	**0.98 U**	**0.91 U**	0.88 U	0.92 U	0.90 U
Arsenic	mg/Kg	13	16	**1.8 J**	**3.0**	**2.8**	**3.1**	**2.5**	**2.9**	**2.9**	**4.5**	**2.1 J**	**1.1 J**	**5.3**	**3.6**	**1.5 J**	**5.9**	**2.0 J**
Barium	mg/Kg	350	400	**76.8**	**64.8**	**78.1**	**72.7**	**39.3**	**83.9**	**94.1**	**176**	**71.3**	**61.5**	**85.8**	**71.3**	**72.5**	**81.9**	**79.8**
Beryllium	mg/Kg	7.2	72	**0.18 J**	**0.32**	**0.24 J**	**0.52**	**0.23 J**	**0.29 J**	**0.29 J**	**0.30 J**	**0.26 J**	**0.17 J**	**0.46**	**0.28 J**	**0.14 J**	**0.58**	**0.26 J**
Cadmium	mg/Kg	2.5	4.3	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.12 U	**0.16 J**	**0.11 U**	**0.11 U**	**0.13 U**	**0.12 U**	0.11 U	0.12 U	0.12 U
Calcium	mg/Kg			**2260**	**693 J**	**1490**	**2400 F1**	**615 J**	**1120**	**1660**	**1580**	**705 J**	**1540**	**606 J**	**914**	**4980**	**1870**	**772 J**
Chromium	mg/Kg			**18.6**	**21.9**	**19.4**	**40.2**	**15.3**	**18.3**	**45.6**	**25.2**	**20.0**	**17.4**	**93.4**	**16.4**	**16.2**	**57.7**	**32.1**
Cobalt	mg/Kg			**6.6 J**	**5.6 J**	**7.4 J**	**7.3 J**	**4.2 J**	**9.2**	**8.4 J**	**4.9 J**	**6.6 J**	**5.8 J**	**4.9 J**	**6.7 J**	**3.4 J**	**6.9 J**	**5.5 J**
Copper	mg/Kg	50	270	**15.7**	**14.1**	**18.3**	**18.3**	**8.4**	**17.5**	**19.8**	**22.8**	**20.0**	**19.5**	**36.2**	**15.0**	**12.2**	**18.4**	**14.4**
Cyanide, Total	mg/Kg	27	27	0.10 U	**0.15 J**	0.12 U	0.12 U	0.12 U	**6.2**	0.12 U	**1.1**	**0.38**	**0.11 U**	**0.20 J**	**0.19 J**	**0.17 J**	**0.40**	0.11 U
Iron	mg/Kg			**14800**	**13700**	**16200**	**16800**	**13700**	**16700**	**20900**	**15200**	**16200**	**12900**	**26600**	**16300**	**11700**	**19400**	**16000**
Lead	mg/Kg	63	400	**4.0**	**7.2**	**5.3**	**8.8**	**15.3**	**4.3**	**25.9**	**186**	**4.4**	**2.9**	**47.4**	**4.7**	**3.0**	**107**	**3.8**
Magnesium	mg/Kg			**3530**	**2100**	**3210**	**3180 F1**	**2110**	**3060**	**3960**	**2210**	**2490**	**2720**	**2770**	**2440**	**4650**	**2790**	**2940**
Manganese	mg/Kg	1600	2000	**263**	**488**	**427**	**389**	**241**	**515**	**511**	**228**	**302**	**143**	**152**	**537**	**184**	**440**	**311**
Mercury	mg/Kg	0.18	0.81	**0.010 J**	0.011 U	0.010 U	**0.014 J**	**0.83**	0.010 U	**0.14**	**0.81**	**0.040**	**0.014 J**	**0.072**	**0.014 J**	**0.012 J**	**0.39**	**0.014 J**
Nickel	mg/Kg	30	310	**15.5**	**14.0**	**18.4**	**19.5**	**8.5**	**19.2**	**21.1**	**12.1**	**17.8**	**14.9**	**45.1**	**19.6**	**13.5**	**252**	**16.0**
Potassium	mg/Kg			**3550**	**1830**	**2980**	**2590**	**1090**	**3470**	**3500**	**1460**	**2740**	**2920**	**883 J**	**2580**	**2620**	**861 J**	**3150**
Selenium	mg/Kg	3.9	180	1.9 U	1.9 U	2.0 U	2.1 U	1.9 U	1.9 U	2.2 U	**2.1 U**	**1.8 U**	**2.0 U**	**2.2 U**	**2.1 U**	2.0 U	2.1 U	2.0 U
Silver	mg/Kg	2	180	0.15 U	**0.40 J**	**0.42 J**	**1.1 J**	0.15 U	0.15 U	**0.17 J**	**0.16 J**	**0.15 U**	**0.15 U**	**0.18 J**	**0.16 U**	0.16 U	**0.26 J**	0.16 U
Sodium	mg/Kg			**295 J**	**86.7 J**	**124 J**	**228 J**	**133 J**	**105 J**	**156 J**	**211 J**	**158 J**	**126 J**	**501 J**	**190 J**	**360 J**	**163 J**	**106 J**
Thallium	mg/Kg			0.52 U	0.51 U	0.53 U	0.56 U	0.51 U	0.51 U	0.58 U	**0.55 U**	**0.49 U**	**0.52 U**	**0.59 U**	**0.55 U**	0.53 U	0.56 U	0.54 U
Vanadium	mg/Kg			**25.1**	**17.8**	**23.1**	**24.3**	**20.6**	**25.6**	**31.9**	**24.5**	**24.0**	**21.2**	**36.3**	**21.3**	**18.7**	**30.9**	**25.1**
Zinc	mg/Kg	109		**31.8**	**22.4**	**32.9**	**35.7**	**34.3**	**32.3**	**53.6**	**91.2**	**68.9**	**39.8**	**53.1**	**40.1**	**159**	**61.5**	**30.2**

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Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-15 S-18 (12-12.5) 5/7/2019 12:10 PM	460-181391-36 S-19 (1.5-2) 5/7/2019 12:20 PM	460-181391-25 S-19 (7-7.5) 5/7/2019 12:30 PM	460-181391-10 S-19 (12-12.5) 5/7/2019 12:40 PM	460-181391-5 S-20 (4.5-5) 5/7/2019 10:35 AM	460-181391-17 S-20 (9-9.5) 5/7/2019 10:45 AM	460-181391-34 S-20 (14-14.5) 5/7/2019 10:55 AM	460-181391-22 S-20 (17-17.5) 5/7/2019 11:05 AM	460-181391-21 S-20 (20-20.5) 5/7/2019 11:15 AM	460-181467-7 S-21 (3-3.5) 5/8/2019 8:40 AM	460-181467-8 S-21 (8-8.5) 5/8/2019 8:45 AM	460-181467-9 S-21 (14-14.5) 5/8/2019 8:55 AM	460-181467-16 S-22 (1.5-2) 5/8/2019 10:00 AM	460-181467-17 S-22 (5.5-6) 5/8/2019 10:05 AM
Aluminum	mg/Kg			**6820**	**9630**	**10500**	**4590**	**17300**	**9290**	**7890**	**6420**	**4170**	**15300**	**9470**	**11800**	**16000**	**9860**
Antimony	mg/Kg			0.85 U	1.0 U	0.92 U	0.85 U	1.0 U	0.88 U	0.88 U	0.97 U	0.90 U	1.3 U	1.1 U	1.1 U	1.3 U	1.2 U
Arsenic	mg/Kg	13	16	**1.5 J**	**11.8**	**2.9**	**1.7 J**	**5.8**	**1.9 J**	**1.2 J**	**1.6 J**	**1.3 J**	**4.9**	**2.6 J**	**1.5 J**	**3.8**	**2.2 J**
Barium	mg/Kg	350	400	**64.6**	**249**	**88.0**	**44.4**	**89.2**	**76.6**	**80.9**	**70.7**	**46.5**	**70.4**	**59.0**	**103**	**65.9**	**76.6**
Beryllium	mg/Kg	7.2	72	**0.18 J**	**0.60**	**0.40**	**0.13 J**	**0.60**	**0.20 J**	**0.19 J**	**0.14 J**	**0.12 J**	**0.61**	**0.30 J**	**0.25 J**	**0.62**	**0.29 J**
Cadmium	mg/Kg	2.5	4.3	0.11 U	**0.38 J**	0.12 U	0.11 U	0.13 U	0.11 U	0.11 U	0.12 U	0.11 U	0.16 U	0.14 U	0.14 U	0.16 U	0.15 U
Calcium	mg/Kg			**1900**	**2800**	**1000**	**1520**	**1620**	**1080**	**1740**	**7630**	**3070**	**2220**	**683 J**	**1120**	**1620**	**1130**
Chromium	mg/Kg			**22.0**	**767**	**55.3**	**74.9**	**26.7**	**16.9**	**19.7**	**16.3**	**13.9**	**26.4**	**23.1**	**29.3**	**23.0**	**19.3**
Cobalt	mg/Kg			**6.6 J**	**6.7 J**	**7.2 J**	**5.2 J**	**13.7**	**7.8 J**	**5.1 J**	**4.8 J**	**4.5 J**	**6.7 J**	**5.7 J**	**9.1 J**	**6.8 J**	**6.5 J**
Copper	mg/Kg	50	270	**16.4**	**40.2**	**16.0**	**19.5**	**21.2**	**95.8**	**37.7**	**40.0**	**12.6**	**16.8**	**14.5**	**20.3**	**11.9**	**16.2**
Cyanide, Total	mg/Kg	27	27	0.10 U	**0.60**	**0.17 J**	0.12 U	0.11 U	**0.16 J**	0.12 U	0.12 U	0.13 U	**0.49**	**0.13 J**	0.10 U	**0.13 J**	0.11 U
Iron	mg/Kg			**13400**	**39400**	**19100**	**10400**	**24800**	**15400**	**14300**	**11700**	**9380**	**21600**	**18100**	**20300**	**20200**	**15900**
Lead	mg/Kg	63	400	**4.2**	**819**	**6.6**	**3.0**	**27.5**	**3.8**	**4.0**	**2.9**	**2.4**	**68.9**	**5.0**	**3.9**	**26.0**	**4.9**
Magnesium	mg/Kg			**3100**	**1800**	**2970**	**1870**	**4730**	**2740**	**3350**	**6070**	**3200**	**2810**	**2790**	**4430**	**3000**	**2610**
Manganese	mg/Kg	1600	2000	**199**	**470**	**420**	**184**	**520**	**349**	**182**	**202**	**112**	**423**	**307**	**355**	**396**	**515**
Mercury	mg/Kg	0.18	0.81	**0.011 J**	**2.5**	0.010 U	**0.012 J**	**0.059**	**0.014 J**	0.010 U	0.011 U	0.011 U	**0.48**	0.0098 U	0.0098 U	**0.090**	**0.013 J**
Nickel	mg/Kg	30	310	**15.5**	**18.8**	**17.2**	**25.0**	**20.5**	**17.5**	**16.7**	**13.1**	**14.0**	**17.4**	**13.0**	**23.8**	**13.8**	**15.9**
Potassium	mg/Kg			**2730**	**754 J**	**3550**	**1880**	**1510**	**2770**	**3730**	**2790**	**2080**	**1040 J**	**2590**	**5810**	**1120 J**	**2900**
Selenium	mg/Kg	3.9	180	1.9 U	**2.5 J**	2.1 U	1.9 U	2.3 U	2.0 U	2.0 U	2.2 U	2.0 U	2.9 U	2.5 U	2.5 U	2.8 U	2.6 U
Silver	mg/Kg	2	180	0.15 U	**0.42 J**	0.16 U	0.15 U	**0.23 J**	0.16 U	0.16 U	0.17 U	0.16 U	0.23 U	0.20 U	0.19 U	0.23 U	0.21 U
Sodium	mg/Kg			**164 J**	**129 J**	70.0 U	**98.9 J**	**156 J**	**136 J**	**171 J**	**188 J**	**97.6 J**	**124 J**	85.3 U	**137 J**	**406 J**	**368 J**
Thallium	mg/Kg			0.51 U	0.63 U	0.56 U	0.51 U	0.61 U	0.53 U	0.53 U	0.58 U	0.54 U	0.77 U	0.68 U	1.6 U	0.76 U	0.70 U
Vanadium	mg/Kg			**19.2**	**25.8**	**26.6**	**14.9**	**40.2**	**22.6**	**23.2**	**18.8**	**14.5**	**33.6**	**23.5**	**34.0**	**30.4**	**23.2**
Zinc	mg/Kg	109		**29.4**	**412**	**42.1**	**25.5**	**49.2**	**31.6**	**31.3**	**22.5**	**28.8**	**104**	**28.6**	**44.9**	**43.1**	**28.8**

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

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Metals (9012, 7470, 6010)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-18 S-22 (10.5-11) 5/8/2019 10:10 AM	460-181467-4 S-23 (4-4.5) 5/8/2019 8:15 AM	460-181467-5 S-23 (9-9.5) 5/8/2019 8:20 AM	460-181467-6 S-23 (13.5-14) 5/8/2019 8:30 AM	460-181391-29 S-24 (4.5-5) 5/7/2019 12:50 PM	460-181391-4 S-24(9 -9.5) 5/7/2019 1:00 PM	460-181391-35 S-24 (14.5-15) 5/7/2019 1:05 PM	460-181467-1 S-25 (2.5-3) 5/8/2019 7:45 AM	460-181467-2 S-25 (6.5-7) 5/8/2019 8:00 AM	460-181467-3 S-25 (12-12.5) 5/8/2019 8:10 AM	460-181391-11 S-26 (3-3.5) 5/7/2019 1:25 PM	460-181391-20 S-26 (8-8.5) 5/7/2019 1:36 PM	460-181391-37 S-26 (13-13.5) 5/7/2019 1:35 PM	460-181391-12 S-26 (18.5-19) 5/7/2019 1:50 PM
Aluminum	mg/Kg			**9930**	**12600**	**9690**	**7840**	**10700**	**8690**	**7990**	**18700**	**11500**	**9690**	**15400**	**11100**	**8800**	**4530**
Antimony	mg/Kg			1.2 U	1.1 U	1.2 U	1.2 U	0.88 U	0.88 U	0.83 U	1.3 U	1.2 U	1.2 U	0.97 U	0.95 U F1	0.86 U	0.85 U
Arsenic	mg/Kg	13	16	**1.9 J**	**2.7 J**	**2.5 J**	**1.9 J**	**2.5**	**1.9 J**	**1.3 J**	**4.6**	**2.2 J**	**1.9 J**	**5.6**	**3.2**	**1.3 J**	**1.7 J**
Barium	mg/Kg	350	400	**72.4**	**54.1**	**70.1**	**60.3**	**35.1**	**72.2**	**84.2**	**92.7**	**74.1**	**70.4**	**80.5**	**79.5**	**88.0**	**45.7**
Beryllium	mg/Kg	7.2	72	**0.31 J**	**0.36 J**	**0.30 J**	**0.21 J**	**0.33**	**0.16 J**	**0.20 J**	**0.50**	**0.37 J**	**0.29 J**	**0.64**	**0.29 J**	**0.21 J**	**0.10 J**
Cadmium	mg/Kg	2.5	4.3	0.15 U	0.15 U	0.15 U	0.15 U	0.11 U	0.11 U	0.11 U	0.17 U	0.15 U	0.15 U	**0.16 J**	0.12 U	0.11 U	0.11 U
Calcium	mg/Kg			**980 J**	**441 J**	**682 J**	**1130**	**1920**	**1520**	**8050**	**1380**	**632 J**	**869 J**	**1850**	**672 J**	**2380**	**6380**
Chromium	mg/Kg			**21.6**	**20.8**	**18.8**	**16.7**	**14.8**	**19.5**	**21.8**	**37.8**	**17.4**	**20.7**	**22.2**	**23.5**	**22.9**	**11.1**
Cobalt	mg/Kg			**6.6 J**	**7.6 J**	**6.8 J**	**6.6 J**	**6.5 J**	**7.5 J**	**8.2**	**8.0 J**	**11.2**	**6.8 J**	**7.3 J**	**7.7 J**	**7.6 J**	**4.4 J**
Copper	mg/Kg	50	270	**15.4**	**15.6**	**14.9**	**14.8**	**8.7**	**27.6**	**37.1**	**32.0**	**16.9**	**16.2**	**15.1**	**15.9**	**19.5**	**9.7**
Cyanide, Total	mg/Kg	27	27	0.11 U	0.10 U	0.11 U	0.12 U	0.12 U	0.12 U	0.12 U	**0.26 J**	0.11 U	0.11 U	**0.15 J**	0.10 U	0.12 U	0.11 U
Iron	mg/Kg			**15500**	**17600**	**16700**	**14900**	**12600**	**14700**	**17100**	**25900**	**18400**	**16200**	**21200**	**19200**	**16000**	**9190**
Lead	mg/Kg	63	400	**8.9**	**4.9**	**4.0**	**3.4**	**4.2**	**3.4**	**4.0**	**75.9**	**4.6**	**8.7**	**33.6**	**4.5**	**5.3**	**2.8**
Magnesium	mg/Kg			**2570**	**2520**	**2560**	**2630**	**2170**	**2890**	**6180**	**3560**	**2510**	**2750**	**2730**	**3090**	**4180**	**4450**
Manganese	mg/Kg	1600	2000	**405**	**525**	**742**	**356**	**367**	**329**	**214**	**161**	**459**	**209**	**453**	**467**	**207**	**139**
Mercury	mg/Kg	0.18	0.81	0.0099 U	0.0099 U	0.011 U	0.011 U	0.010 U	**0.011 J**	0.011 U	**0.062**	0.011 U	0.011 U	**0.11**	0.011 U	0.010 U	**0.010 J**
Nickel	mg/Kg	30	310	**15.1**	**13.5**	**14.4**	**13.3**	**13.9**	**14.0**	**18.5**	**20.3**	**14.0**	**16.0**	**14.1**	**14.9**	**18.3**	**9.5**
Potassium	mg/Kg			**2740**	**2490**	**2480**	**2640**	**819 J**	**2610**	**3630**	**2530**	**2580**	**2310**	**820 J**	**3250**	**3660**	**2020**
Selenium	mg/Kg	3.9	180	2.6 U	2.6 U	2.6 U	2.6 U	2.0 U	2.0 U	1.9 U	2.9 U	2.6 U	2.6 U	2.2 U	2.1 U	1.9 U	1.9 U
Silver	mg/Kg	2	180	0.21 U	0.20 U	0.21 U	0.21 U	**0.16 J**	0.16 U	0.15 U	0.23 U	0.21 U	0.21 U	0.17 U	**0.18 J**	0.15 U	0.15 U
Sodium	mg/Kg			**251 J**	**90.3 J**	**90.9 J**	**106 J**	**100 J**	**111 J**	**154 J**	**279 J**	**140 J**	**152 J**	**115 J**	**156 J**	**295 J**	**126 J**
Thallium	mg/Kg			0.70 U	0.69 U	0.70 U	0.70 U	0.53 U	0.53 U	0.50 U	0.78 U	0.71 U	0.71 U	0.58 U	0.57 U	0.52 U	0.51 U
Vanadium	mg/Kg			**22.0**	**24.4**	**21.9**	**20.9**	**18.6**	**24.0**	**27.4**	**41.5**	**23.3**	**22.8**	**31.9**	**30.5**	**26.5**	**13.9**
Zinc	mg/Kg	109		**29.8**	**31.0**	**28.2**	**27.8**	**15.3**	**26.0**	**33.2**	**148**	**82.1**	**63.8**	**288**	**32.2**	**35.5**	**18.6**

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

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Table 1C
Summary of Soil Sampling Results
Metals (9012, 7470, 6010)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-13 S-26 (22.5-23) 5/7/2019 2:00 PM	460-192138-1 SB-27i (12-14) 9/23/2019 1:45 PM	460-192138-2 SB-27ii (15-17) 9/23/2019 2:05 PM	460-192138-3 SB-27iii (18-20) 9/23/2019 2:20 PM	460-192138-4 SB-28i (12-14) 9/23/2019 2:45 PM	460-192138-5 SB-28ii (15-17) 9/23/2019 3:05 PM	460-192138-6 SB-28iii (18-20) 9/23/2019 3:20 PM	460-192461-1 SB-29i(12-14) 9/26/2019 3:20 PM	460-192461-2 SB-29ii(15-17) 9/26/2019 3:35 PM	460-192461-3 SB-29iii(18-20) 9/26/2019 3:55 PM	460-192461-4 SB-30i(2-3) 9/26/2019 4:45 PM	460-192461-5 SB-30ii(8-9) 9/26/2019 5:00 PM	460-192461-6 SB-30iii(11-12) 9/26/2019 5:15 PM	460-192461-7 SB-30iv(17-18) 9/26/2019 5:30 PM	460-192460-1 SB-31(2.5-3) 9/27/2019 8:30 AM	460-192460-2 SB-31(7.5-8) 9/27/2019 8:35 AM	460-192460-3 SB-31(12.5-13) 9/27/2019 8:40 AM
Aluminum	mg/Kg			**5360**	**6670**	**8830**	**6410**	**7070**	**8010**	**8970**	**8060**	**9990**	**6630**	**12000**	**9350**	**5720**	**4750**	**13500**	**9100**	**7350**
Antimony	mg/Kg			0.90 U	1.1 U	1.2 U	1.1 U	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.2 U	1.2 U F1	1.1 U
Arsenic	mg/Kg	13	16	**1.0 J**	**1.3 J**	**2.2 J**	**1.3 J**	**1.6 J**	**1.7 J**	**1.3 J**	1.2 U	1.2 U	1.2 U	**2.5 J**	1.2 U	**3.5**	1.2 U	**4.0**	**2.6 J**	**1.5 J**
Barium	mg/Kg	350	400	**70.0**	**40.4 J**	**94.1**	**72.1**	**78.7**	**77.4**	**89.9**	**79.2**	**87.8**	**78.6**	**94.8**	**66.7**	**84.2**	**47.9**	**114**	**69.3**	**66.5**
Beryllium	mg/Kg	7.2	72	**0.11 J**	**0.23 J**	**0.36 J**	**0.27 J**	**0.30 J**	**0.35 J**	**0.32 J**	**0.25 J**	**0.35 J**	**0.22 J**	**0.45**	**0.34 J**	**0.22 J**	**0.17 J**	**0.53**	**0.35 J**	**0.29 J**
Cadmium	mg/Kg	2.5	4.3	0.12 U	0.14 U	0.15 U	0.15 U	0.13 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.15 U	0.14 U	0.15 U	0.14 U	0.15 U	0.15 U	0.14 U
Calcium	mg/Kg			**3390**	**3770**	**1500**	**2940**	**1690**	**1850**	**4270**	**1560**	**4080**	**3970**	**1110**	**1440**	**25600**	**4330**	**2360**	**1180**	**1750**
Chromium	mg/Kg			**15.1**	**11.6**	**31.0**	**17.6**	**16.2**	**23.8**	**23.1**	**18.9**	**34.2**	**19.2**	**24.2**	**22.1**	**29.1**	**12.2**	**25.2**	**17.3**	**16.9**
Cobalt	mg/Kg			**6.3 J**	**6.6 J**	**7.3 J**	**6.1 J**	**7.2 J**	**7.1 J**	**7.4 J**	**7.1 J**	**6.9 J**	**6.3 J**	**7.1 J**	**8.3 J**	**6.1 J**	**4.6 J**	**7.4 J**	**6.9 J**	**6.1 J**
Copper	mg/Kg	50	270	**14.0**	**8.8**	**16.3**	**14.7**	**15.6**	**16.2**	**15.8**	**17.1**	**24.6**	**13.9**	**16.9**	**33.6**	**11.6**	**10.6**	**27.1**	**15.9**	**14.7**
Cyanide, Total	mg/Kg	27	27	0.10 U	0.11 U	0.10 U F1	0.10 U	0.11 U	**0.14 J**	0.12 U	0.12 U	0.12 U	0.11 U	0.12 U	0.12 U	**0.28**	0.10 U	0.13 U	0.12 U	0.12 U
Iron	mg/Kg			**10900**	**11900**	**16600**	**12300**	**13900**	**15300**	**15800**	**14200**	**18000**	**12800**	**19700**	**18700**	**12700**	**9490**	**20400**	**16200**	**13500**
Lead	mg/Kg	63	400	**2.5**	**2.1**	**4.7**	**2.8**	**3.5**	**4.1**	**3.3**	**3.6**	**47.5**	**2.7**	**81.8**	**3.8**	**11.7**	**2.6**	**171**	**4.6**	**3.5**
Magnesium	mg/Kg			**3630**	**4630**	**3400**	**4100**	**2930**	**3240**	**5440**	**3090**	**4440**	**4310**	**2870**	**3010**	**3020**	**3700**	**3500**	**2480**	**2750**
Manganese	mg/Kg	1600	2000	**117**	**248**	**331**	**164**	**183**	**213**	**184**	**233**	**327**	**152**	**531**	**708**	**1440**	**111**	**425**	**438**	**177**
Mercury	mg/Kg	0.18	0.81	0.010 U	0.011 U	0.010 U	0.010 U	0.0096 U	0.011 U	0.0095 U	0.0097 U	**0.17**	0.0096 U	**0.075**	0.010 U	0.011 U	0.0098 U	**0.13 F1**	**0.011 J**	**0.011 J**
Nickel	mg/Kg	30	310	**14.1**	**15.8**	**18.5**	**15.2**	**14.6**	**16.0**	**16.8**	**15.4**	**22.9**	**15.4**	**15.8**	**20.2**	**10**	**10.3**	**17.5**	**15.5**	**13.5**
Potassium	mg/Kg			**2630**	**1760**	**3920**	**3440**	**3030**	**3450**	**4900**	**3700**	**3540**	**3230**	**1980**	**2750**	**1580**	**2300**	**2100**	**2430**	**3210**
Selenium	mg/Kg	3.9	180	2.0 U	2.5 U	2.6 U	2.6 U	2.3 U	2.5 U	2.4 U	2.4 U	2.4 U	2.4 U	2.6 U	2.5 U	2.6 U	2.5 U	2.6 U	2.6 U	2.5 U
Silver	mg/Kg	2	180	0.16 U	0.20 U	0.21 U	0.20 U	0.18 U	0.20 U	0.19 U	0.19 U	0.19 U	0.19 U	0.20 U	0.20 U	0.20 U	0.20 U	0.21 U	0.21 U	0.20 U
Sodium	mg/Kg			**131 J**	**144 J**	**150 J**	**134 J**	**179 J**	**207 J**	**162 J**	**172 J**	**186 J**	**179 J**	**378 J**	**249 J**	**204 J**	**136 J**	**135 J**	**115 J**	**163 J**
Thallium	mg/Kg			0.54 U	0.66 U	0.70 U	0.68 U	0.62 U	0.68 U	0.65 U	0.64 U	0.65 U	0.63 U	0.68 U	0.68 U	0.68 U	0.66 U	0.71 U	0.70 U	0.66 U
Vanadium	mg/Kg			**18.9**	**19.2**	**27.3**	**20.7**	**20.5**	**22.8**	**28.6**	**23.4**	**27.5**	**21.9**	**30.4**	**33.1**	**19.0**	**15.2**	**32.7**	**21.3**	**21.4**
Zinc	mg/Kg	109		**20.5**	**24.7**	**36.0**	**24.4**	**29.0**	**32.1**	**34.9**	**33.7**	**75.6**	**26.4**	**78.1**	**37.9**	**33.0**	**22.4**	**115**	**29.4**	**28.2**

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Metals (9012, 7470, 6010)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-192460-4 SB-31(8-18.5) 9/27/2019 8:45 AM	460-192460-5 SB-31(22.5-23) 9/27/2019 8:50 AM	460-192460-6 SB-31(27.5-28) 9/27/2019 8:55 AM	460-192460-7 SB-32(3-3.5) 9/27/2019 9:05 AM	460-192460-8 SB-32(7-7.5) 9/27/2019 9:10 AM	460-192460-9 SB-32(11-11.5) 9/27/2019 9:15 AM	460-192460-10 SB-32(16-16.5) 9/27/2019 9:20 AM	460-192460-11 SB-32(21.5-22) 9/27/2019 9:25 AM	460-192460-12 SB-33(3.5-4) 9/27/2019 10:10 AM	460-192460-13 SB-33(8.5-9) 9/27/2019 10:20 AM	460-192460-14 SB-33(13.5-14) 9/27/2019 10:35 AM	460-192460-15 SB-33(18.5-19) 9/27/2019 10:40 AM	460-192460-16 SB-33(23.5-24) 9/27/2019 10:45 AM	460-192460-17 SB-34(1.5-2) 9/27/2019 11:00 AM	460-192460-18 SB-34(6.5-7) 9/27/2019 11:05 AM	460-192460-19 SB-34(11.5-12) 9/27/2019 11:10 AM
Aluminum	mg/Kg			**8080**	**6530**	**5410**	**14300**	**10500**	**7160**	**7510**	**8940**	**15300**	**11500**	**8140**	**8760**	**16000**	**15700**	**8980**	**8770**
Antimony	mg/Kg			1.2 U	1.1 U	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.3 U	1.0 U	1.1 U
Arsenic	mg/Kg	13	16	1.3 U	**1.2 J**	1.2 U	**3.8**	**2.1 J**	1.2 U	**1.3 J**	**1.5 J**	**3.0**	**2.7 J**	**1.8 J**	**1.5 J**	**7.0**	**8.9**	**2.2 J**	**1.6 J**
Barium	mg/Kg	350	400	**77.4**	**69.5**	**64.1**	**46.3**	**99.6**	**67.5**	**69.1**	**98.7**	**117**	**87.6**	**81.3**	**89.7**	**90.6**	**90.1**	**64.9**	**74.0**
Beryllium	mg/Kg	7.2	72	**0.27 J**	**0.22 J**	**0.20 J**	**0.60**	**0.40 J**	**0.26 J**	**0.28 J**	**0.29 J**	**0.56**	**0.42 J**	**0.28 J**	**0.31 J**	**0.73**	**0.59**	**0.32 J**	**0.35 J**
Cadmium	mg/Kg	2.5	4.3	0.15 U	0.14 U	0.14 U	0.16 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.15 U	**0.16 J**	0.13 U	0.14 U
Calcium	mg/Kg			**4920**	**5820**	**6370**	**777 J**	**1480**	**1610**	**6810**	**7350**	**657 J**	**931 J**	**1880**	**5530**	**6860**	**2820**	**658 J**	**2310**
Chromium	mg/Kg			**19.9**	**16.6**	**18.7**	**28.3**	**24.1**	**17.2**	**18.2**	**23.2**	**25.8**	**22.2**	**20.3**	**21.5**	**32.0**	**26.9**	**17.5**	**19.5**
Cobalt	mg/Kg			**6.3 J**	**7.3 J**	**6.8 J**	**6.0 J**	**7.9 J**	**6.3 J**	**7.0 J**	**7.4 J**	**8.7 J**	**8.0 J**	**7.1 J**	**7.5 J**	**7.5 J**	**7.3 J**	**6.4 J**	**6.9 J**
Copper	mg/Kg	50	270	**14.2**	**24.6**	**11.9**	**11.9**	**20.0**	**14.4**	**14.2**	**17.7**	**20.9**	**16.8**	**18.1**	**16.0**	**227**	**21.3**	**12.8**	**16.6**
Cyanide, Total	mg/Kg	27	27	0.12 U	0.12 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.12 U	0.11 U	0.12 U	0.12 U	0.13 U	0.12 U	0.11 U
Iron	mg/Kg			**14200**	**13000**	**12200**	**20500**	**19400**	**13300**	**14200**	**16900**	**21300**	**18700**	**15300**	**15700**	**24000**	**21100**	**14800**	**15300**
Lead	mg/Kg	63	400	**3.4**	**3.9**	**2.9**	**1900**	**5.1**	**3.4**	**3.6**	**3.7**	**5.7**	**5.3**	**4.4**	**4.1**	**33.6**	**113**	**4.4**	**3.9**
Magnesium	mg/Kg			**4870**	**3980**	**4120**	**3080**	**3680**	**2900**	**5540**	**6080**	**3630**	**3380**	**3270**	**5370**	**1190**	**3830**	**2380**	**3360**
Manganese	mg/Kg	1600	2000	**198**	**215**	**189**	**307**	**372**	**145**	**174**	**233**	**616**	**443**	**299**	**234**	**307**	**352**	**460**	**197**
Mercury	mg/Kg	0.18	0.81	**0.012 J**	**0.0099 J**	**0.012 J**	**0.028**	**0.013 J**	**0.011 J**	**0.012 J**	**0.012 J**	**0.014 J**	**0.012 J**	**0.011 J**	**0.013 J**	**0.011 J**	**0.23**	**0.010 J**	**0.011 J**
Nickel	mg/Kg	30	310	**15.6**	**15.5**	**17.0**	**12.7**	**18.6**	**13.9**	**14.5**	**17.2**	**20.4**	**17.1**	**20.1**	**17.3**	**24.4**	**16.3**	**11.5**	**15.8**
Potassium	mg/Kg			**3780**	**3060**	**2770**	**941 J**	**4630**	**3320**	**3390**	**4450**	**4080**	**3660**	**3420**	**4440**	**430 J**	**764 J**	**2460**	**3170**
Selenium	mg/Kg	3.9	180	2.6 U	2.4 U	2.5 U	2.8 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.5 U	2.5 U	2.4 U	2.5 U	2.8 U	2.3 U	2.4 U
Silver	mg/Kg	2	180	0.21 U	0.19 U	0.20 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.20 U	0.20 U	0.19 U	0.20 U	0.22 U	0.19 U	0.19 U
Sodium	mg/Kg			**176 J**	**163 J**	**129 J**	**243 J**	**265 J**	**183 J**	**186 J**	**231 J**	**142 J**	**161 J**	**235 J**	**189 J**	85.8 U	**135 J**	**136 J**	**268 J**
Thallium	mg/Kg			0.69 U	0.64 U	0.66 U	0.74 U	0.65 U	0.65 U	0.65 U	0.65 U	0.64 U	0.68 U	0.67 U	0.64 U	0.68 U	0.76 U	0.63 U	0.64 U
Vanadium	mg/Kg			**25.4**	**20.0**	**18.6**	**32.9**	**31.5**	**21.5**	**22.9**	**28.0**	**32.6**	**27.9**	**24.1**	**26.2**	**36.8**	**35.3**	**23.0**	**23.5**
Zinc	mg/Kg	109		**28.9**	**24.1**	**20.1**	**32.0**	**37.7**	**30.9**	**27.4**	**32.2**	**36.6**	**34.2**	**30.1**	**32.3**	**286**	**132**	**24.9**	**31.7**

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is

U : Indicates the analyte was analyzed for but not detected.

Table 1D
Summary of Soil Sampling Results
Pesticides (8081)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-19 S-9 (2.5-3) 5/8/2019 10:45 AM	460-181467-20 S-9 (8-8.5) 5/8/2019 10:50 AM	460-181467-21 S-9 (14.5-15) 5/8/2019 10:55 AM	460-181467-22 S-9 (17.5-18) 5/8/2019 11:15 AM	460-181467-23 S-9 (23.5-24) 5/8/2019 11:20 AM	460-181467-13 S-10 (4-4.5) 5/8/2019 9:35 AM	460-181467-14 S-10 (8.5-9) 5/8/2019 9:40 AM	460-181467-15 S-10 (11.5-12) 5/8/2019 9:50 AM	460-181467-10 S-11 (2.2-2.5) 5/8/2019 9:15 AM	460-181467-11 S-11 (6.5-7) 5/8/2019 9:20 AM	460-181467-12 S-11 (13-13.5) 5/8/2019 9:30 AM	460-181391-32 S-12 (2-2.5) 5/7/2019 10:00 AM	460-181391-23 S-12 (6.5-7) 5/7/2019 10:15 AM	460-181391-24 S-12 (11-11.5) 5/7/2019 10:20 AM
4,4'-DDD	mg/Kg	0.0033	13	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDE	mg/Kg	0.0033	8.9	0.00084 U	0.00086 U	0.00084 U	0.00086 U	0.00085 U	0.00087 U	0.00086 U	0.00086 U	0.00093 U	0.00087 U	0.00087 U	0.00091 U	0.00089 U	0.00089 U
4,4'-DDT	mg/Kg	0.0033	7.9	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U
Aldrin	mg/Kg	0.005	0.097	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U
alpha-BHC	mg/Kg	0.02	0.48	0.00072 U	0.00074 U	0.00073 U	0.00074 U	0.00073 U	0.00075 U	0.00074 U	0.00074 U	0.00080 U	0.00075 U	0.00075 U	0.00078 U	0.00077 U	0.00076 U
beta-BHC	mg/Kg	0.036	0.36	0.00080 U	0.00082 U	0.00080 U	0.00082 U	0.00080 U	0.00083 U	0.00082 U	0.00082 U	0.00089 U	0.00082 U	0.00083 U	0.00086 U	0.00085 U	0.00084 U
Chlordane	mg/Kg			0.017 U	0.018 U	0.017 U	0.018 U	0.017 U	0.018 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U
Chlordane (n.o.s.)	mg/Kg			0.017 U	0.018 U	0.017 U	0.018 U	0.017 U	0.018 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U
cis-Chlordane	mg/Kg	0.094	4.2	0.0011 U	0.0012 U	0.0011 U	0.0012 U	0.0011 U	0.0012 U	0.0012 U	0.0012 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U
delta-BHC	mg/Kg	0.04	100	0.00043 U	0.00045 U	0.00044 U	0.00045 U	0.00044 U	0.00045 U	0.00045 U	0.00045 U	0.00049 U	0.00045 U	0.00045 U	0.00047 U	0.00046 U	0.00046 U
Dieldrin	mg/Kg	0.005	0.2	0.00092 U	0.00095 U	0.00093 U	0.00095 U	0.00093 U	0.00096 U	0.00095 U	0.00095 U	0.0010 U	0.00096 U	0.00096 U	0.0010 U	0.00098 U	0.00098 U
Endosulfan I	mg/Kg	2.4	24	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U
Endosulfan II	mg/Kg	2.4	24	0.0018 U	0.0019 U	0.0018 U	0.0019 U	0.0018 U	0.0019 U	0.0019 U	0.0019 U	0.0020 U	0.0019 U	0.0019 U	0.0020 U	0.0019 U	0.0019 U
Endosulfan sulfate	mg/Kg	2.4	24	0.00089 U	0.00091 U	0.00090 U	0.00092 U	0.00090 U	0.00093 U	0.00092 U	0.00091 U	0.00099 U	0.00092 U	0.00093 U	0.00097 U	0.00095 U	0.00094 U
Endosulfan, Total	mg/Kg			0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U
Endrin	mg/Kg	0.014	11	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Endrin aldehyde	mg/Kg			0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U	0.0018 U
Endrin ketone	mg/Kg			0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0015 U	0.0014 U	0.0014 U	0.0015 U	0.0015 U	0.0015 U
gamma-BHC (Lindane)	mg/Kg	0.1	1.3	0.00066 U	0.00067 U	0.00066 U	0.00068 U	0.00066 U	0.00068 U	0.00068 U	0.00067 U	0.00073 U	0.00068 U	0.00069 U	0.00071 U	0.00070 U	0.00070 U
Heptachlor	mg/Kg	0.042	2.1	0.00084 U	0.00086 U	0.00084 U	0.00086 U	0.00085 U	0.00087 U	0.00086 U	0.00086 U	0.00093 U	0.00087 U	0.00087 U	0.00091 U	0.00089 U	0.00089 U
Heptachlor epoxide	mg/Kg			0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Methoxychlor	mg/Kg			0.0016 U	0.0017 U	0.0016 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U
Toxaphene	mg/Kg			0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.027 U	0.026 U	0.026 U	0.029 U	0.027 U	0.027 U	0.028 U	0.027 U	0.027 U
trans-Chlordane	mg/Kg			0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

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Table 1D
Summary of Soil Sampling Results
Pesticides (8081)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-31 S-13 (2-2.5) 5/7/2019 9:30 AM	460-181391-8 S-13 (8-8.5) 5/7/2019 9:40 AM	460-181391-14 S-13 (11.5-12) 5/7/2019 9:50 AM	460-181391-28 S-14 (4-4.5) 5/7/2019 9:15 AM	460-181391-33 S-14 (9-9.5) 5/7/2019 9:16 AM	460-181391-3 S-14 (10.5-11) 5/7/2019 9:25 AM	460-181391-1 S-15 (2-2.5) 5/7/2019 8:55 AM	460-181391-30 S-15 (8-8.5) 5/7/2019 9:00 AM	460-181391-2 S-15 (11-11.5) 5/7/2019 9:10 AM	460-181391-19 S-16 (3-3.5) 5/7/2019 8:25 AM	460-181391-6 S-16 (7-7.5) 5/7/2019 8:40 AM	460-181391-7 S-16 (11.5-12) 5/7/2019 8:50 AM	460-181391-26 S-17 (3-3.5) 5/7/2019 11:25 AM
4,4'-DDD	mg/Kg	0.0033	13	0.0014 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0014 U	0.0012 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U	0.0014 U
4,4'-DDE	mg/Kg	0.0033	8.9	0.00099 U	0.00088 U	0.00087 U	0.00086 U	0.00086 U	0.00087 U	0.00096 U	0.00086 U	0.00089 U	**0.0049 J**	0.00083 U	0.00087 U	0.00094 U
4,4'-DDT	mg/Kg	0.0033	7.9	0.0015 U	0.0014 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0015 U	0.0013 U	0.0014 U	**0.0040 J**	0.0013 U	0.0013 U	0.0015 U
Aldrin	mg/Kg	0.005	0.097	0.0013 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U
alpha-BHC	mg/Kg	0.02	0.48	0.00085 U	0.00075 U	0.00075 U	0.00074 U	0.00074 U	0.00075 U	0.00082 U	0.00074 U	0.00076 U	0.00079 U	0.00072 U	0.00074 U	0.00081 U
beta-BHC	mg/Kg	0.036	0.36	0.00094 U	0.00083 U	0.00082 U	0.00081 U	0.00081 U	0.00083 U	0.00091 U	0.00082 U	0.00084 U	0.00087 U	0.00079 U	0.00082 U	0.00089 U F1
Chlordane	mg/Kg			0.020 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.020 U	0.018 U	0.018 U	0.019 U	0.017 U	0.018 U	0.019 U
Chlordane (n.o.s.)	mg/Kg			0.020 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.020 U	0.018 U	0.018 U	0.019 U	0.017 U	0.018 U	0.019 U
cis-Chlordane	mg/Kg	0.094	4.2	0.0013 U	0.0012 U	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U	0.0011 U	0.0012 U	0.0013 U F1
delta-BHC	mg/Kg	0.04	100	0.00052 U	0.00045 U	0.00045 U	0.00045 U	0.00044 U	0.00045 U	0.00050 U	0.00045 U	0.00046 U	0.00048 U	0.00043 U	0.00045 U	0.00049 U
Dieldrin	mg/Kg	0.005	0.2	0.0011 U	0.00096 U	0.00096 U	0.00094 U	0.00094 U	0.00096 U	0.0011 U	0.00095 U	0.00098 U	0.0010 U	0.00092 U	0.00095 U	0.0010 U F1
Endosulfan I	mg/Kg	2.4	24	0.0013 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U F1
Endosulfan II	mg/Kg	2.4	24	0.0022 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0021 U	0.0019 U	0.0019 U	0.0020 U	0.0018 U	0.0019 U	0.0020 U F1
Endosulfan sulfate	mg/Kg	2.4	24	0.0011 U	0.00093 U	0.00092 U	0.00091 U	0.00091 U	0.00093 U	0.0010 U	0.00091 U	0.00094 U	0.00098 U	0.00088 U	0.00092 U	0.0010 U F1
Endosulfan, Total	mg/Kg			0.0013 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U F1
Endrin	mg/Kg	0.014	11	0.0012 U	0.0011 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.0012 U	0.0010 U	0.0011 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U F1
Endrin aldehyde	mg/Kg			0.0020 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0019 U F1
Endrin ketone	mg/Kg			0.0016 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0016 U	0.0014 U	0.0015 U	0.0015 U	0.0014 U	0.0014 U	0.0015 U
gamma-BHC (Lindane)	mg/Kg	0.1	1.3	0.00078 U	0.00069 U	0.00068 U	0.00067 U	0.00067 U	0.00068 U	0.00075 U	0.00067 U	0.00070 U	0.00072 U	0.00065 U	0.00068 U	0.00074 U F1
Heptachlor	mg/Kg	0.042	2.1	0.00099 U	0.00088 U	0.00087 U	0.00086 U	0.00086 U	0.00087 U	0.00096 U	0.00086 U	0.00089 U	0.00092 U	0.00083 U	0.00087 U	0.00094 U F1
Heptachlor epoxide	mg/Kg			0.0013 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U F1
Methoxychlor	mg/Kg			0.0019 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0017 U	0.0018 U	0.0016 U	0.0017 U	0.0018 U
Toxaphene	mg/Kg			0.030 U	0.027 U	0.027 U	0.026 U	0.026 U	0.027 U	0.029 U	0.026 U	0.027 U	0.028 U	0.025 U	0.027 U	0.029 U
trans-Chlordane	mg/Kg			0.0015 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0012 U	0.0013 U	0.0014 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1D
Summary of Soil Sampling Results
Pesticides (8081)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-18 S-17 (7-7.5) 5/7/2019 11:35 AM	460-181391-9 S-17 (13.5-14) 5/7/2019 11:45 AM	460-181391-27 S-18 (2-2.5) 5/7/2019 11:50 AM	460-181391-16 S-18 (6-6.5) 5/7/2019 12:00 PM	460-181391-15 S-18 (12-12.5) 5/7/2019 12:10 PM	460-181391-36 S-19 (1.5-2) 5/7/2019 12:20 PM	460-181391-25 S-19 (7-7.5) 5/7/2019 12:30 PM	460-181391-10 S-19 (12-12.5) 5/7/2019 12:40 PM	460-181391-5 S-20 (4.5-5) 5/7/2019 10:35 AM	460-181391-17 S-20 (9-9.5) 5/7/2019 10:45 AM	460-181391-34 S-20 (14-14.5) 5/7/2019 10:55 AM	460-181391-22 S-20 (17-17.5) 5/7/2019 11:05 AM	460-181391-21 S-20 (20-20.5) 5/7/2019 11:15 AM
4,4'-DDD	mg/Kg	0.0033	13	0.0013 U	0.0012 U	0.0014 U	0.0012 U	0.0012 U	0.0014 U	0.0012 U	0.0013 U	0.0014 U	0.0012 U	0.0012 U	0.0013 U	0.0013 U
4,4'-DDE	mg/Kg	0.0033	8.9	0.00087 U	0.00086 U	0.00094 U	0.00087 U	0.00086 U	0.00094 U	0.00086 U	0.00087 U	0.00095 U	0.00086 U	0.00085 U	0.00089 U	0.00089 U
4,4'-DDT	mg/Kg	0.0033	7.9	0.0014 U	0.0013 U	0.0015 U	0.0013 U	0.0013 U	0.0015 U	0.0013 U	0.0014 U	0.0015 U	0.0013 U	0.0013 U	0.0014 U	0.0014 U
Aldrin	mg/Kg	0.005	0.097	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
alpha-BHC	mg/Kg	0.02	0.48	0.00075 U	0.00074 U	0.00081 U	0.00075 U	0.00074 U	0.00081 U	0.00074 U	0.00075 U	0.00082 U	0.00074 U	0.00073 U	0.00077 U	0.00076 U
beta-BHC	mg/Kg	0.036	0.36	0.00083 U	0.00081 U	0.00090 U	0.00082 U	0.00081 U	0.00090 U	0.00082 U	0.00082 U	0.00090 U	0.00082 U	0.00081 U	0.00085 U	0.00084 U
Chlordane	mg/Kg			0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.017 U	0.018 U	0.018 U
Chlordane (n.o.s.)	mg/Kg			0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.019 U	0.018 U	0.017 U	0.018 U	0.018 U
cis-Chlordane	mg/Kg	0.094	4.2	0.0012 U	0.0011 U	0.0013 U	0.0012 U	0.0011 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0012 U	0.0011 U	0.0012 U	0.0012 U
delta-BHC	mg/Kg	0.04	100	0.00045 U	0.00044 U	0.00049 U	0.00045 U	0.00044 U	0.00049 U	0.00045 U	0.00045 U	0.00049 U	0.00045 U	0.00044 U	0.00046 U	0.00046 U
Dieldrin	mg/Kg	0.005	0.2	0.00096 U	0.00094 U	0.0010 U	0.00095 U	0.00094 U	0.0010 U	0.00095 U	0.00095 U	0.0010 U	0.00095 U	0.00094 U	0.00099 U	0.00098 U
Endosulfan I	mg/Kg	2.4	24	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U
Endosulfan II	mg/Kg	2.4	24	0.0019 U	0.0019 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
Endosulfan sulfate	mg/Kg	2.4	24	0.00092 U	0.00091 U	0.0010 U	0.00092 U	0.00091 U	0.0010 U	0.00092 U	0.00092 U	0.0010 U	0.00092 U	0.00090 U	0.00095 U	0.00094 U
Endosulfan, Total	mg/Kg			0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U
Endrin	mg/Kg	0.014	11	0.0011 U	0.0010 U	0.0011 U	0.0011 U	0.0010 U	0.0011 U	0.0010 U	0.0011 U	0.0012 U	0.0011 U	0.0010 U	0.0011 U	0.0011 U
Endrin aldehyde	mg/Kg			0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0017 U	0.0018 U	0.0018 U
Endrin ketone	mg/Kg			0.0014 U	0.0014 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0014 U	0.0014 U	0.0015 U	0.0015 U
gamma-BHC (Lindane)	mg/Kg	0.1	1.3	0.00068 U	0.00067 U	0.00074 U	0.00068 U	0.00067 U	0.00074 U	0.00068 U	0.00068 U	0.00074 U	0.00068 U	0.00067 U	0.00070 U	0.00070 U
Heptachlor	mg/Kg	0.042	2.1	0.00087 U	0.00086 U	0.00094 U	0.00087 U	0.00086 U	0.00094 U	0.00086 U	0.00087 U	0.00095 U	0.00086 U	0.00085 U	0.00089 U	0.00089 U
Heptachlor epoxide	mg/Kg			0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Methoxychlor	mg/Kg			0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Toxaphene	mg/Kg			0.027 U	0.026 U	0.029 U	0.027 U	0.026 U	0.029 U	0.026 U	0.027 U	0.029 U	0.026 U	0.026 U	0.027 U	0.027 U
trans-Chlordane	mg/Kg			0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1D
Summary of Soil Sampling Results
Pesticides (8081)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-7 S-21 (3-3.5) 5/8/2019 8:40 AM	460-181467-8 S-21 (8-8.5) 5/8/2019 8:45 AM	460-181467-9 S-21 (14-14.5) 5/8/2019 8:55 AM	460-181467-16 S-22 (1.5-2) 5/8/2019 10:00 AM	460-181467-17 S-22 (5.5-6) 5/8/2019 10:05 AM	460-181467-18 S-22 (10.5-11) 5/8/2019 10:10 AM	460-181467-4 S-23 (4-4.5) 5/8/2019 8:15 AM	460-181467-5 S-23 (9-9.5) 5/8/2019 8:20 AM	460-181467-6 S-23 (13.5-14) 5/8/2019 8:30 AM	460-181391-29 S-24 (4.5-5) 5/7/2019 12:50 PM	460-181391-4 S-24(9 -9.5) 5/7/2019 1:00 PM	460-181391-35 S-24 (14.5-15) 5/7/2019 1:05 PM
4,4'-DDD	mg/Kg	0.0033	13	0.0014 U	0.0012 U	0.0012 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0012 U	0.0013 U	0.0012 U	0.0012 U
4,4'-DDE	mg/Kg	0.0033	8.9	0.00096 U	0.00085 U	0.00086 U	0.00094 U	0.00087 U	0.00087 U	0.00088 U	0.00086 U	0.00086 U	0.00088 U	0.00086 U	0.00085 U
4,4'-DDT	mg/Kg	0.0033	7.9	0.0015 U	0.0013 U	0.0013 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U
Aldrin	mg/Kg	0.005	0.097	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
alpha-BHC	mg/Kg	0.02	0.48	0.00083 U	0.00073 U	0.00074 U	0.00081 U	0.00075 U	0.00075 U	0.00075 U	0.00074 U	0.00074 U	0.00076 U	0.00074 U	0.00073 U
beta-BHC	mg/Kg	0.036	0.36	0.00092 U	0.00081 U	0.00082 U	0.00089 U	0.00083 U	0.00083 U	0.00083 U	0.00082 U	0.00082 U	0.00084 U	0.00082 U	0.00081 U
Chlordane	mg/Kg			0.020 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
Chlordane (n.o.s.)	mg/Kg			0.020 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U	0.018 U
cis-Chlordane	mg/Kg	0.094	4.2	0.0013 U	0.0011 U	0.0012 U	0.0013 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0011 U
delta-BHC	mg/Kg	0.04	100	0.00050 U	0.00044 U	0.00045 U	0.00049 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00045 U	0.00046 U	0.00045 U	0.00044 U
Dieldrin	mg/Kg	0.005	0.2	0.0011 U	0.00094 U	0.00095 U	0.0010 U	0.00096 U	0.00096 U	0.00097 U	0.00095 U	0.00095 U	0.00097 U	0.00095 U	0.00094 U
Endosulfan I	mg/Kg	2.4	24	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Endosulfan II	mg/Kg	2.4	24	0.0021 U	0.0019 U	0.0019 U	0.0020 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U	0.0019 U
Endosulfan sulfate	mg/Kg	2.4	24	0.0010 U	0.00091 U	0.00092 U	0.0010 U	0.00092 U	0.00092 U	0.00093 U	0.00092 U	0.00092 U	0.00094 U	0.00091 U	0.00091 U
Endosulfan, Total	mg/Kg			0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Endrin	mg/Kg	0.014	11	0.0012 U	0.0010 U	0.0010 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0010 U	0.0010 U	0.0011 U	0.0010 U	0.0010 U
Endrin aldehyde	mg/Kg			0.0019 U	0.0017 U	0.0017 U	0.0019 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U
Endrin ketone	mg/Kg			0.0016 U	0.0014 U	0.0014 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U	0.0015 U	0.0014 U	0.0014 U
gamma-BHC (Lindane)	mg/Kg	0.1	1.3	0.00076 U	0.00067 U	0.00068 U	0.00074 U	0.00068 U	0.00068 U	0.00069 U	0.00068 U	0.00068 U	0.00069 U	0.00067 U	0.00067 U
Heptachlor	mg/Kg	0.042	2.1	0.00096 U	0.00085 U	0.00086 U	0.00094 U	0.00087 U	0.00087 U	0.00088 U	0.00086 U	0.00086 U	0.00088 U	0.00086 U	0.00085 U
Heptachlor epoxide	mg/Kg			0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Methoxychlor	mg/Kg			0.0019 U	0.0017 U	0.0017 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Toxaphene	mg/Kg			0.030 U	0.026 U	0.026 U	0.029 U	0.027 U	0.027 U	0.027 U	0.026 U	0.026 U	0.027 U	0.026 U	0.026 U
trans-Chlordane	mg/Kg			0.0014 U	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1D
Summary of Soil Sampling Results
Pesticides (8081)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-1 S-25 (2.5-3) 5/8/2019 7:45 AM	460-181467-2 S-25 (6.5-7) 5/8/2019 8:00 AM	460-181467-3 S-25 (12-12.5) 5/8/2019 8:10 AM	460-181391-11 S-26 (3-3.5) 5/7/2019 1:25 PM	460-181391-20 S-26 (8-8.5) 5/7/2019 1:36 PM	460-181391-37 S-26 (13-13.5) 5/7/2019 1:35 PM	460-181391-12 S-26 (18.5-19) 5/7/2019 1:50 PM	460-181391-13 S-26 (22.5-23) 5/7/2019 2:00 PM
4,4'-DDD	mg/Kg	0.0033	13	0.0014 U F1	0.0013 U	0.0013 U	0.0013 U	0.0012 U	0.0013 U	0.0012 U	0.0012 U
4,4'-DDE	mg/Kg	0.0033	8.9	0.00096 U F1	0.00087 U	0.00088 U	0.00090 U	0.00086 U	0.00087 U	0.00084 U	0.00085 U
4,4'-DDT	mg/Kg	0.0033	7.9	0.0015 U F1	0.0014 U	0.0014 U	0.0014 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U
Aldrin	mg/Kg	0.005	0.097	0.0012 U F1	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
alpha-BHC	mg/Kg	0.02	0.48	0.00083 U F1	0.00075 U	0.00076 U	0.00078 U	0.00074 U	0.00075 U	0.00073 U	0.00073 U
beta-BHC	mg/Kg	0.036	0.36	0.00091 U F2 F1	0.00083 U	0.00084 U	0.00086 U	0.00082 U	0.00083 U	0.00080 U	0.00081 U
Chlordane	mg/Kg			0.020 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.017 U	0.017 U
Chlordane (n.o.s.)	mg/Kg			0.020 U	0.018 U	0.018 U	0.019 U	0.018 U	0.018 U	0.017 U	0.017 U
cis-Chlordane	mg/Kg	0.094	4.2	0.0013 U F1	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0012 U	0.0011 U	0.0011 U
delta-BHC	mg/Kg	0.04	100	0.00050 U F1	0.00045 U	0.00046 U	0.00047 U	0.00045 U	0.00045 U	0.00044 U	0.00044 U
Dieldrin	mg/Kg	0.005	0.2	0.0011 U F1	0.00096 U	0.00097 U	0.00099 U	0.00095 U	0.00096 U	0.00093 U	0.00093 U
Endosulfan I	mg/Kg	2.4	24	0.0012 U F1	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Endosulfan II	mg/Kg	2.4	24	0.0021 U F1	0.0019 U	0.0019 U	0.0020 U	0.0019 U	0.0019 U	0.0018 U	0.0018 U
Endosulfan sulfate	mg/Kg	2.4	24	0.0010 U F1	0.00093 U	0.00094 U	0.00096 U	0.00091 U	0.00093 U	0.00090 U	0.00090 U
Endosulfan, Total	mg/Kg			0.0012 U F1	0.0011 U	0.0011 U	0.0012 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Endrin	mg/Kg	0.014	11	0.0012 U F1	0.0011 U	0.0011 U	0.0011 U	0.0010 U	0.0011 U	0.0010 U	0.0010 U
Endrin aldehyde	mg/Kg			0.0019 U F1	0.0017 U	0.0018 U	0.0018 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Endrin ketone	mg/Kg			0.0016 U F1	0.0014 U	0.0015 U	0.0015 U	0.0014 U	0.0014 U	0.0014 U	0.0014 U
gamma-BHC (Lindane)	mg/Kg	0.1	1.3	0.00076 U F1	0.00069 U	0.00069 U	0.00071 U	0.00067 U	0.00068 U	0.00066 U	0.00067 U
Heptachlor	mg/Kg	0.042	2.1	0.00096 U F1	0.00087 U	0.00088 U	0.00090 U	0.00086 U	0.00087 U	0.00084 U	0.00085 U
Heptachlor epoxide	mg/Kg			0.0012 U F1	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U	0.0011 U
Methoxychlor	mg/Kg			0.0019 U F1	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0016 U	0.0016 U
Toxaphene	mg/Kg			0.029 U	0.027 U	0.027 U	0.028 U	0.026 U	0.027 U	0.026 U	0.026 U
trans-Chlordane	mg/Kg			0.0014 U F1	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1E
Summary of Soil Sampling Results
PCBs (8082)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-19 S-9 (2.5-3) 5/8/2019 10:45 AM	460-181467-20 S-9 (8-8.5) 5/8/2019 10:50 AM	460-181467-21 S-9 (14.5-15) 5/8/2019 10:55 AM	460-181467-22 S-9 (17.5-18) 5/8/2019 11:15 AM	460-181467-23 S-9 (23.5-24) 5/8/2019 11:20 AM	460-181467-13 S-10 (4-4.5) 5/8/2019 9:35 AM	460-181467-14 S-10 (8.5-9) 5/8/2019 9:40 AM	460-181467-15 S-10 (11.5-12) 5/8/2019 9:50 AM	460-181467-10 S-11 (2.2-2.5) 5/8/2019 9:15 AM	460-181467-11 S-11 (6.5-7) 5/8/2019 9:20 AM	460-181467-12 S-11 (13-13.5) 5/8/2019 9:30 AM	460-181391-32 S-12 (2-2.5) 5/7/2019 10:00 AM	460-181391-23 S-12 (6.5-7) 5/7/2019 10:15 AM	460-181391-24 S-12 (11-11.5) 5/7/2019 10:20 AM	460-181391-31 S-13 (2-2.5) 5/7/2019 9:30 AM
Aroclor 1016	mg/Kg			0.0094 U	0.0097 U	0.0095 U	0.0097 U	0.0095 U	0.0098 U	0.0097 U	0.0097 U	0.011 U	0.0098 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U
Aroclor 1221	mg/Kg			0.0094 U	0.0097 U	0.0095 U	0.0097 U	0.0095 U	0.0098 U	0.0097 U	0.0097 U	0.011 U	0.0098 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U
Aroclor 1232	mg/Kg			0.0094 U	0.0097 U	0.0095 U	0.0097 U	0.0095 U	0.0098 U	0.0097 U	0.0097 U	0.011 U	0.0098 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U
Aroclor 1242	mg/Kg			0.0094 U	0.0097 U	0.0095 U	0.0097 U	0.0095 U	0.0098 U	0.0097 U	0.0097 U	0.011 U	0.0098 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U
Aroclor 1248	mg/Kg			0.0094 U	0.0097 U	0.0095 U	0.0097 U	0.0095 U	0.0098 U	0.0097 U	0.0097 U	0.011 U	0.0098 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U
Aroclor 1254	mg/Kg			0.0098 U	0.010 U	0.0098 U	0.010 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.012 U
Aroclor 1260	mg/Kg			0.0098 U	0.010 U	0.0098 U	0.010 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.012 U
Aroclor 1262	mg/Kg			0.0098 U	0.010 U	0.0098 U	0.010 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.012 U
Aroclor 1268	mg/Kg			0.0098 U	0.010 U	0.0098 U	0.010 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.012 U
Polychlorinated biphenyls, Total	mg/Kg	0.1	1	0.0098 U	0.010 U	0.0098 U	0.010 U	0.0098 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.012 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1E
Summary of Soil Sampling Results
PCBs (8082)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-8 S-13 (8-8.5) 5/7/2019 9:40 AM	460-181391-14 S-13 (11.5-12) 5/7/2019 9:50 AM	460-181391-28 S-14 (4-4.5) 5/7/2019 9:15 AM	460-181391-33 S-14 (9-9.5) 5/7/2019 9:16 AM	460-181391-3 S-14 (10.5-11) 5/7/2019 9:25 AM	460-181391-1 S-15 (2-2.5) 5/7/2019 8:55 AM	460-181391-30 S-15 (8-8.5) 5/7/2019 9:00 AM	460-181391-2 S-15 (11-11.5) 5/7/2019 9:10 AM	460-181391-19 S-16 (3-3.5) 5/7/2019 8:25 AM	460-181391-6 S-16 (7-7.5) 5/7/2019 8:40 AM	460-181391-7 S-16 (11.5-12) 5/7/2019 8:50 AM	460-181391-26 S-17 (3-3.5) 5/7/2019 11:25 AM	460-181391-18 S-17 (7-7.5) 5/7/2019 11:35 AM	460-181391-9 S-17 (13.5-14) 5/7/2019 11:45 AM
Aroclor 1016	mg/Kg			0.0099 U	0.0098 U	0.0097 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.010 U	0.010 U	0.0094 U	0.0097 U	0.011 U	0.0098 U	0.0096 U
Aroclor 1221	mg/Kg			0.0099 U	0.0098 U	0.0097 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.010 U	0.010 U	0.0094 U	0.0097 U	0.011 U	0.0098 U	0.0096 U
Aroclor 1232	mg/Kg			0.0099 U	0.0098 U	0.0097 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.010 U	0.010 U	0.0094 U	0.0097 U	0.011 U	0.0098 U	0.0096 U
Aroclor 1242	mg/Kg			0.0099 U	0.0098 U	0.0097 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.010 U	0.010 U	0.0094 U	0.0097 U	0.011 U	0.0098 U	0.0096 U
Aroclor 1248	mg/Kg			0.0099 U	0.0098 U	0.0097 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.010 U	0.010 U	0.0094 U	0.0097 U	0.011 U	0.0098 U	0.0096 U
Aroclor 1254	mg/Kg			0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.0097 U	0.010 U	0.011 U	0.010 U	0.010 U
Aroclor 1260	mg/Kg			0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.0097 U	0.010 U	0.011 U	0.010 U	0.010 U
Aroclor 1262	mg/Kg			0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.0097 U	0.010 U	0.011 U	0.010 U	0.010 U
Aroclor 1268	mg/Kg			0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.0097 U	0.010 U	0.011 U	0.010 U	0.010 U
Polychlorinated biphenyls, Total	mg/Kg	0.1	1	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.0097 U	0.010 U	0.011 U	0.010 U	0.010 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an ap

U : Indicates the analyte was analyzed for but not detected.

Table 1E
Summary of Soil Sampling Results
PCBs (8082)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-27 S-18 (2-2.5) 5/7/2019 11:50 AM	460-181391-16 S-18 (6-6.5) 5/7/2019 12:00 PM	460-181391-15 S-18 (12-12.5) 5/7/2019 12:10 PM	460-181391-36 S-19 (1.5-2) 5/7/2019 12:20 PM	460-181391-25 S-19 (7-7.5) 5/7/2019 12:30 PM	460-181391-10 S-19 (12-12.5) 5/7/2019 12:40 PM	460-181391-5 S-20 (4.5-5) 5/7/2019 10:35 AM	460-181391-17 S-20 (9-9.5) 5/7/2019 10:45 AM	460-181391-34 S-20 (14-14.5) 5/7/2019 10:55 AM	460-181391-22 S-20 (17-17.5) 5/7/2019 11:05 AM	460-181391-21 S-20 (20-20.5) 5/7/2019 11:15 AM	460-181467-7 S-21 (3-3.5) 5/8/2019 8:40 AM	460-181467-8 S-21 (8-8.5) 5/8/2019 8:45 AM	460-181467-9 S-21 (14-14.5) 5/8/2019 8:55 AM
Aroclor 1016	mg/Kg			0.011 U	0.0098 U	0.0096 U	0.011 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.0096 U	0.010 U	0.010 U	0.011 U	0.0096 U	0.0097 U
Aroclor 1221	mg/Kg			0.011 U	0.0098 U	0.0096 U	0.011 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.0096 U	0.010 U	0.010 U	0.011 U	0.0096 U	0.0097 U
Aroclor 1232	mg/Kg			0.011 U	0.0098 U	0.0096 U	0.011 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.0096 U	0.010 U	0.010 U	0.011 U	0.0096 U	0.0097 U
Aroclor 1242	mg/Kg			0.011 U	0.0098 U	0.0096 U	0.011 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.0096 U	0.010 U	0.010 U	0.011 U	0.0096 U	0.0097 U
Aroclor 1248	mg/Kg			0.011 U	0.0098 U	0.0096 U	0.011 U	0.0097 U	0.0098 U	0.011 U	0.0097 U	0.0096 U	0.010 U	0.010 U	0.011 U	0.0096 U	0.0097 U
Aroclor 1254	mg/Kg			0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.0099 U	0.010 U	0.010 U	0.011 U	0.0099 U	0.010 U
Aroclor 1260	mg/Kg			0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.0099 U	0.010 U	0.010 U	0.011 U	0.0099 U	0.010 U
Aroclor 1262	mg/Kg			0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.0099 U	0.010 U	0.010 U	0.011 U	0.0099 U	0.010 U
Aroclor 1268	mg/Kg			0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.0099 U	0.010 U	0.010 U	0.011 U	0.0099 U	0.010 U
Polychlorinated biphenyls, Total	mg/Kg	0.1	1	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U	0.0099 U	0.010 U	0.010 U	0.011 U	0.0099 U	0.010 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an ap

U : Indicates the analyte was analyzed for but not detected.

Table 1E
Summary of Soil Sampling Results
PCBs (8082)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181467-16 S-22 (1.5-2) 5/8/2019 10:00 AM	460-181467-17 S-22 (5.5-6) 5/8/2019 10:05 AM	460-181467-18 S-22 (10.5-11) 5/8/2019 10:10 AM	460-181467-4 S-23 (4-4.5) 5/8/2019 8:15 AM	460-181467-5 S-23 (9-9.5) 5/8/2019 8:20 AM	460-181467-6 S-23 (13.5-14) 5/8/2019 8:30 AM	460-181391-29 S-24 (4.5-5) 5/7/2019 12:50 PM	460-181391-4 S-24(9 -9.5) 5/7/2019 1:00 PM	460-181391-35 S-24 (14.5-15) 5/7/2019 1:05 PM	460-181467-1 S-25 (2.5-3) 5/8/2019 7:45 AM	460-181467-2 S-25 (6.5-7) 5/8/2019 8:00 AM	460-181467-3 S-25 (12-12.5) 5/8/2019 8:10 AM	460-181391-11 S-26 (3-3.5) 5/7/2019 1:25 PM	460-181391-20 S-26 (8-8.5) 5/7/2019 1:36 PM
Aroclor 1016	mg/Kg			0.011 U	0.0098 U	0.0098 U	0.0099 U	0.0097 U	0.0097 U	0.010 U	0.0097 U	0.0096 U	0.011 U	0.0099 U	0.0099 U	0.010 U	0.0097 U
Aroclor 1221	mg/Kg			0.011 U	0.0098 U	0.0098 U	0.0099 U	0.0097 U	0.0097 U	0.010 U	0.0097 U	0.0096 U	0.011 U	0.0099 U	0.0099 U	0.010 U	0.0097 U
Aroclor 1232	mg/Kg			0.011 U	0.0098 U	0.0098 U	0.0099 U	0.0097 U	0.0097 U	0.010 U	0.0097 U	0.0096 U	0.011 U	0.0099 U	0.0099 U	0.010 U	0.0097 U
Aroclor 1242	mg/Kg			0.011 U	0.0098 U	0.0098 U	0.0099 U	0.0097 U	0.0097 U	0.010 U	0.0097 U	0.0096 U	0.011 U	0.0099 U	0.0099 U	0.010 U	0.0097 U
Aroclor 1248	mg/Kg			0.011 U	0.0098 U	0.0098 U	0.0099 U	0.0097 U	0.0097 U	0.010 U	0.0097 U	0.0096 U	0.011 U	0.0099 U	0.0099 U	0.010 U	0.0097 U
Aroclor 1254	mg/Kg			0.011 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U
Aroclor 1260	mg/Kg			0.011 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U
Aroclor 1262	mg/Kg			0.011 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U
Aroclor 1268	mg/Kg			0.011 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U
Polychlorinated biphenyls, Total	mg/Kg	0.1	1	0.011 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0099 U	0.011 U	0.010 U	0.010 U	0.011 U	0.010 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an ap

U : Indicates the analyte was analyzed for but not detected.

Table 1E
Summary of Soil Sampling Results
PCBs (8082)
Cottage - Garden Auto Repair

Analyte	Units	Part 375-6.8(a) Unrestricted Use Soil Cleanup Objectives	Part 375-6.8(b) Restricted Residential Soil Cleanup Objectives	460-181391-37 S-26 (13-13.5) 5/7/2019 1:35 PM	460-181391-12 S-26 (18.5-19) 5/7/2019 1:50 PM	460-181391-13 S-26 (22.5-23) 5/7/2019 2:00 PM	460-192138-1 SB-27i (12-14) 9/23/2019 1:45 PM	460-192138-2 SB-27ii (15-17) 9/23/2019 2:05 PM	460-192138-3 SB-27iii (18-20) 9/23/2019 2:20 PM	460-192138-4 SB-28i (12-14) 9/23/2019 2:45 PM	460-192138-5 SB-28ii (15-17) 9/23/2019 3:05 PM	460-192138-6 SB-28iii (18-20) 9/23/2019 3:20 PM
Aroclor 1016	mg/Kg			0.0098 U	0.0095 U	0.0096 U	0.0097 U	0.0098 U	0.0098 U	0.0097 U	0.0098 U	0.0094 U
Aroclor 1221	mg/Kg			0.0098 U	0.0095 U	0.0096 U	0.0097 U	0.0098 U	0.0098 U	0.0097 U	0.0098 U	0.0094 U
Aroclor 1232	mg/Kg			0.0098 U	0.0095 U	0.0096 U	0.0097 U	0.0098 U	0.0098 U	0.0097 U	0.0098 U	0.0094 U
Aroclor 1242	mg/Kg			0.0098 U	0.0095 U	0.0096 U	0.0097 U	0.0098 U	0.0098 U	0.0097 U	0.0098 U	0.0094 U
Aroclor 1248	mg/Kg			0.0098 U	0.0095 U	0.0096 U	0.0097 U	0.0098 U	0.0098 U	0.0097 U	0.0098 U	0.0094 U
Aroclor 1254	mg/Kg			0.010 U	0.0098 U	0.0099 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0097 U
Aroclor 1260	mg/Kg			0.010 U	0.0098 U	0.0099 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0097 U
Aroclor 1262	mg/Kg			0.010 U	0.0098 U	0.0099 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0097 U
Aroclor 1268	mg/Kg			0.010 U	0.0098 U	0.0099 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0097 U
Polychlorinated biphenyls, Total	mg/Kg	0.1	1	0.010 U	0.0098 U	0.0099 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.0097 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an apı

U : Indicates the analyte was analyzed for but not detected.

Table 1F
Summary of Soil Sampling Results
PFAS
Cottage - Garden Auto Repair

Analyte	Units	460-181467-19 S-9 (2.5-3) 5/8/2019 10:45 AM	460-181467-20 S-9 (8-8.5) 5/8/2019 10:50 AM	460-181467-21 S-9 (14.5-15) 5/8/2019 10:55 AM	460-181467-22 S-9 (17.5-18) 5/8/2019 11:15 AM	460-181467-23 S-9 (23.5-24) 5/8/2019 11:20 AM	460-181467-13 S-10 (4-4.5) 5/8/2019 9:35 AM	460-181467-14 S-10 (8.5-9) 5/8/2019 9:40 AM	460-181467-15 S-10 (11.5-12) 5/8/2019 9:50 AM	460-181467-10 S-11 (2.2-2.5) 5/8/2019 9:15 AM	460-181467-11 S-11 (6.5-7) 5/8/2019 9:20 AM	460-181467-12 S-11 (13-13.5) 5/8/2019 9:30 AM	460-181391-32 S-12 (2-2.5) 5/7/2019 10:00 AM	460-181391-23 S-12 (6.5-7) 5/7/2019 10:15 AM	460-181391-24 S-12 (11-11.5) 5/7/2019 10:20 AM	460-181391-31 S-13 (2-2.5) 5/7/2019 9:30 AM	460-181391-8 S-13 (8-8.5) 5/7/2019 9:40 AM
Perfluorobutanoic acid (PFBA)	ug/Kg	0.029 U	0.030 U	**0.030 J B**	0.029 U	0.029 U	0.031 U	**0.036 J**	0.030 U	0.033 U	0.030 U	0.030 U	0.032 U	0.032 U	0.031 U	0.034 U	0.031 U
Perfluoropentanoic acid (PFPeA)	ug/Kg	0.079 U	0.082 U	0.080 U	0.081 U	0.080 U	0.085 U	0.081 U	0.082 U	0.091 U	0.082 U	0.083 U	0.087 U	0.087 U	0.085 U	0.092 U	0.084 U
Perfluorohexanoic acid (PFHxA)	ug/Kg	0.043 U	0.045 U	0.044 U	0.044 U	0.044 U	0.046 U	0.044 U	0.045 U	0.050 U	0.045 U	0.045 U	0.048 U	0.047 U	0.046 U	0.050 U	0.046 U
Perfluoroheptanoic acid (PFHpA)	ug/Kg	0.030 U	0.031 U	0.030 U	0.030 U	0.030 U	0.032 U	0.031 U	0.031 U	0.034 U	0.031 U	0.031 U	0.033 U	0.033 U	0.032 U	**0.044 J**	0.032 U
Perfluorooctanoic acid (PFOA)	ug/Kg	0.10 J	0.092 U	0.090 U	0.090 U	0.090 U	0.095 U	0.091 U	0.092 U	0.10 U	0.092 U	0.092 U	**0.12 J**	0.097 U	0.095 U	**0.16 J**	0.094 U
Perfluorononanoic acid (PFNA)	ug/Kg	0.037 U	0.039 U	0.038 U	0.038 U	0.038 U	0.040 U	0.038 U	0.039 U	0.043 U	0.039 U	0.039 U	0.041 U	0.041 U	0.040 U	0.043 U	0.039 U
Perfluorodecanoic acid (PFDA)	ug/Kg	0.023 U	0.024 U	0.023 U	0.023 U	0.023 U	0.024 U	0.023 U	0.024 U	0.026 U	0.024 U	0.024 U	0.025 U	0.025 U	0.024 U	0.026 U	0.024 U
Perfluoroundecanoic acid (PFUnA)	ug/Kg	0.037 U	0.039 U	0.038 U	0.038 U	0.038 U	0.040 U	0.038 U	0.039 U	0.043 U	0.039 U	0.039 U	0.041 U	0.041 U	0.040 U	0.043 U	0.039 U
Perfluorododecanoic acid (PFDoA)	ug/Kg	0.069 U	0.072 U	0.070 U	0.070 U	0.070 U	0.074 U	0.071 U	0.072 U	0.079 U	0.072 U	0.072 U	0.076 U	0.076 U	0.074 U	0.080 U	0.073 U
Perfluorotridecanoic acid (PFTriA)	ug/Kg	0.053 U	0.055 U	0.053 U	0.054 U	0.053 U	0.056 U	0.054 U	0.055 U	0.061 U	0.055 U	0.055 U	0.058 U	0.058 U	0.056 U	0.061 U	0.056 U
Perfluorotetradecanoic acid (PFTeA)	ug/Kg	0.056 U	0.058 U	0.056 U	0.057 U	0.056 U	0.060 U	0.057 U	0.058 U	0.064 U	0.058 U	0.058 U	0.061 U	0.061 U	0.060 U	0.065 U	0.059 U
Perfluorobutanesulfonic acid (PFBS)	ug/Kg	0.026 U	0.027 U	0.026 U	0.026 U	0.026 U	0.028 U	0.026 U	0.027 U	0.030 U	0.027 U	0.027 U	0.028 U	0.028 U	0.028 U	0.030 U	0.027 U
Perfluorohexanesulfonic acid (PFHxS)	ug/Kg	0.032 U	0.033 U	0.032 U	0.033 U	0.032 U	0.034 U	0.033 U	0.033 U	0.037 U	0.033 U	0.033 U	0.035 U	0.035 U	0.034 U	0.037 U	0.034 U
Perfluoroheptanesulfonic Acid (PFHpS)	ug/Kg	0.036 U	0.037 U	0.037 U	0.037 U	0.037 U	0.039 U	0.037 U	0.037 U	0.042 U	0.037 U	0.038 U	0.040 U	0.040 U	0.039 U	0.042 U	0.038 U
Perfluorooctanesulfonic acid (PFOS)	ug/Kg	**0.21 J**	0.21 U	0.21 U	0.21 U	0.21 U	0.22 U	0.21 U	0.21 U	0.24 U	0.21 U	0.21 U	**0.52 J**	0.23 U	0.22 U	**0.31 J**	0.22 U
Perfluorodecanesulfonic acid (PFDS)	ug/Kg	0.040 U	0.042 U	0.041 U	0.041 U	0.041 U	0.043 U	0.041 U	0.042 U	0.046 U	0.042 U	0.042 U	0.044 U	0.044 U	0.043 U	0.047 U	0.043 U
Perfluorooctanesulfonamide (FOSA)	ug/Kg	0.085 U	0.088 U	0.086 U	0.086 U	0.086 U	0.091 U	0.086 U	0.088 U	0.097 U	0.088 U	0.088 U	0.093 U	0.093 U	0.090 U	0.098 U	0.090 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ug/Kg	0.40 U	0.42 U	0.41 U	0.41 U	0.41 U	0.43 U	0.41 U	0.42 U	0.46 U	0.42 U	0.42 U	0.44 U	0.44 U	0.43 U	0.47 U	0.43 U
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ug/Kg	0.38 U	0.40 U	0.39 U	0.39 U	0.39 U	0.41 U	0.39 U	0.40 U	0.44 U	0.40 U	0.40 U	0.42 U	0.42 U	0.41 U	0.44 U	0.40 U
6:2 FTS	ug/Kg	0.15 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.17 U	0.17 U	0.17 U	0.18 U	0.16 U
8:2 FTS	ug/Kg	0.26 U	0.27 U	0.26 U	0.26 U	0.26 U	0.28 U	0.26 U	0.27 U	0.30 U	0.27 U	0.27 U	0.28 U	0.28 U	0.28 U	0.30 U	0.27 U

Notes:

Bold cells are detections above the MDL

Detections above the Unrestricted Use Soil Cleanup Objectives

Detections above the Restricted Residential Soil Cleanup Objective

* : LCS or LCSD is outside acceptance limits.

B : Compound was found in the blank and sample.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 1F
Summary of Soil Sampling Results
PFAS
Cottage - Garden Auto Repair

460-181391-14 S-13 (11.5-12) 5/7/2019 9:50 AM	460-181391-28 S-14 (4-4.5) 5/7/2019 9:15 AM	460-181391-33 S-14 (9-9.5) 5/7/2019 9:16 AM	460-181391-3 S-14 (10.5-11) 5/7/2019 9:25 AM	460-181391-1 S-15 (2-2.5) 5/7/2019 8:55 AM	460-181391-30 S-15 (8-8.5) 5/7/2019 9:00 AM	460-181391-2 S-15 (11-11.5) 5/7/2019 9:10 AM	460-181391-19 S-16 (3-3.5) 5/7/2019 8:25 AM	460-181391-6 S-16 (7-7.5) 5/7/2019 8:40 AM	460-181391-7 S-16 (11.5-12) 5/7/2019 8:50 AM	460-181391-26 S-17 (3-3.5) 5/7/2019 11:25 AM	460-181391-18 S-17 (7-7.5) 5/7/2019 11:35 AM	460-181391-9 S-17 (13.5-14) 5/7/2019 11:45 AM	460-181391-27 S-18 (2-2.5) 5/7/2019 11:50 AM	460-181391-15 S-18 (12-12.5) 5/7/2019 12:10 PM	460-181391-16 S-18 (6-6.5) 5/7/2019 12:00 PM	460-181391-36 S-19 (1.5-2) 5/7/2019 12:20 PM	460-181391-25 S-19 (7-7.5) 5/7/2019 12:30 PM	460-181391-10 S-19 (12-12.5) 5/7/2019 12:40 PM	460-181391-5 S-20 (4.5-5) 5/7/2019 10:35 AM
0.030 U	0.030 U	**0.035 J B**	0.030 U	**0.047 J B**	0.030 U	**0.038 J B**	0.032 U	**0.038 J**	0.031 U	0.033 U	0.031 U	0.030 U	0.032 U	0.030 U	0.030 U	0.033 U	0.030 U	0.031 U	**0.036 J**
0.084 U	0.083 U	0.080 U	0.083 U	0.094 U	0.082 U	0.082 U	**0.13 J**	0.079 U	0.084 U	0.090 U	0.084 U	0.082 U	0.088 U	0.082 U	0.083 U	0.090 U	0.082 U	0.085 U	0.091 U
0.046 U	0.045 U	0.044 U	0.045 U	0.051 U	0.044 U	0.045 U	0.048 U	0.043 U	0.046 U	0.049 U	0.046 U	0.045 U	0.048 U	0.045 U	0.045 U	0.049 U	0.045 U	0.046 U	0.050 U
0.032 U	0.031 U	0.030 U	0.031 U	0.036 U	0.031 U	0.031 U	0.033 U	0.030 U	0.032 U	0.034 U	0.032 U	0.031 U	0.033 U	0.031 U	0.031 U	0.034 U	0.031 U	0.032 U	0.034 U
0.094 U	0.093 U	0.090 U	0.092 U	0.11 U	0.091 U	0.092 U	0.098 U	0.088 U	0.094 U	0.10 U	0.094 U	0.091 U	0.098 U	0.091 U	0.093 U	0.10 U	0.092 U	0.094 U	0.10 U
0.039 U	0.039 U	0.038 U	0.039 U	0.044 U	0.038 U	0.039 U	**0.11 J**	**0.061 J**	0.039 U	0.042 U	0.039 U	0.038 U	0.041 U	0.038 U	0.039 U	0.042 U	0.039 U	0.040 U	0.043 U
0.024 U	0.024 U	0.023 U	0.024 U	0.027 U	0.023 U	0.024 U	**0.96**	**0.13 J**	0.024 U	0.026 U	0.024 U	0.023 U	0.025 U	0.023 U	0.024 U	0.026 U	0.024 U	0.024 U	0.026 U
0.039 U	0.039 U	0.038 U	0.039 U	0.044 U	0.038 U	0.039 U	**0.12 J**	0.037 U	0.039 U	0.042 U	0.039 U	0.038 U	0.041 U	0.038 U	0.039 U	0.042 U	0.039 U	0.040 U	0.043 U
0.073 U	0.072 U	0.070 U	0.072 U	0.082 U	0.071 U	0.072 U	0.077 U	0.069 U	0.073 U	0.079 U	0.073 U	0.071 U	0.077 U	0.071 U	0.072 U	0.078 U	0.072 U	0.074 U	0.079 U
0.055 U	0.055 U	0.053 U	0.055 U	0.062 U	0.054 U	0.055 U	0.058 U	0.052 U	0.056 U	0.060 U	0.056 U	0.054 U	0.058 U	0.054 U	0.055 U	0.060 U	0.055 U	0.056 U	0.060 U
0.059 U	0.058 U	0.056 U	0.058 U	0.066 U	0.057 U	0.058 U	0.062 U	0.055 U	0.059 U	0.063 U	0.059 U	0.057 U	0.062 U	0.057 U	0.058 U	0.063 U	0.058 U	0.059 U	0.064 U
0.027 U	0.027 U	0.026 U	0.027 U	0.031 U	0.026 U	0.027 U	0.029 U	0.026 U	0.027 U	0.029 U	0.027 U	0.027 U	0.029 U	0.027 U	0.027 U	**0.032 J**	0.027 U	0.027 U	0.030 U
0.034 U	0.034 U	0.032 U	0.033 U	0.038 U	0.033 U	0.033 U	**0.035 J**	0.032 U	0.034 U	0.036 U	0.034 U	0.033 U	0.035 U	0.033 U	0.033 U	**0.26**	**0.052 J**	0.034 U	0.037 U
0.038 U	0.038 U	0.037 U	0.038 U	0.043 U	0.037 U	0.037 U	0.040 U	0.036 U	0.038 U	0.041 U	0.038 U	0.037 U	0.040 U	0.037 U	0.038 U	0.041 U	0.037 U	0.038 U	0.041 U
0.22 U	0.22 U	0.21 U	0.21 U	**0.25 J**	0.21 U	0.21 U	**1.87**	**0.59**	0.22 U	**1.32**	0.22 U	0.21 U	0.23 U	0.21 U	0.22 U	**0.72**	**4.18**	**0.34 J**	0.24 U
0.042 U	0.042 U	0.041 U	0.042 U	0.048 U	0.041 U	0.042 U	0.045 U	0.040 U	0.043 U	0.046 U	0.043 U	0.041 U	0.045 U	0.041 U	0.042 U	0.046 U	0.042 U	0.043 U	0.046 U
0.089 U	0.089 U	0.086 U	0.088 U	0.10 U	0.087 U	0.088 U	0.094 U	0.084 U	0.090 U	0.096 U	0.090 U	0.087 U	0.094 U	0.087 U	0.089 U	0.096 U	0.088 U	0.090 U	0.097 U
0.42 U	0.42 U	0.41 U	0.42 U	0.48 U	0.41 U	0.42 U	0.45 U	0.40 U	0.43 U	0.46 U	0.43 U	0.41 U	0.45 U	0.41 U	0.42 U	0.46 U	0.42 U	0.43 U	0.46 U
0.40 U	0.40 U	0.39 U	0.40 U	0.45 U	0.39 U	0.40 U	0.42 U	0.38 U	0.40 U	0.43 U	0.41 U	0.39 U	0.42 U	0.39 U	0.40 U	0.43 U	0.40 U	0.41 U	0.44 U
0.16 U	0.16 U	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.17 U	0.15 U	0.16 U	0.18 U	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.18 U
0.27 U	0.27 U	0.26 U	0.27 U	0.31 U	0.26 U	0.27 U	0.29 U	0.26 U	0.27 U	0.29 U	0.27 U	0.27 U	0.29 U	0.27 U	0.27 U	0.29 U	0.27 U	0.27 U	0.30 U

Table 1F
Summary of Soil Sampling Results
PFAS
Cottage - Garden Auto Repair

460-181391-17 S-20 (9-9.5) 5/7/2019 10:45 AM	460-181391-34 S-20 (14-14.5) 5/7/2019 10:55 AM	460-181391-22 S-20 (17-17.5) 5/7/2019 11:05 AM	460-181391-21 S-20 (20-20.5) 5/7/2019 11:15 AM	460-181467-7 S-21 (3-3.5) 5/8/2019 8:40 AM	460-181467-8 S-21 (8-8.5) 5/8/2019 8:45 AM	460-181467-9 S-21 (14-14.5) 5/8/2019 8:55 AM	460-181467-16 S-22 (1.5-2) 5/8/2019 10:00 AM	460-181467-17 S-22 (5.5-6) 5/8/2019 10:05 AM	460-181467-18 S-22 (10.5-11) 5/8/2019 10:10 AM	460-181467-4 S-23 (4-4.5) 5/8/2019 8:15 AM	460-181467-5 S-23 (9-9.5) 5/8/2019 8:20 AM	460-181467-6 S-23 (13.5-14) 5/8/2019 8:30 AM	460-181391-29 S-24 (4.5-5) 5/7/2019 12:50 PM	460-181391-4 S-24(9 -9.5) 5/7/2019 1:00 PM	460-181391-35 S-24 (14.5-15) 5/7/2019 1:05 PM	460-181467-1 S-25 (2.5-3) 5/8/2019 7:45 AM	460-181467-2 S-25 (6.5-7) 5/8/2019 8:00 AM	460-181467-3 S-25 (12-12.5) 5/8/2019 8:10 AM	460-181391-11 S-26 (3-3.5) 5/7/2019 1:25 PM
0.031 U	0.029 U	0.031 U	0.031 U	**0.068 J**	0.030 U	0.031 U	0.033 U	0.031 U	0.030 U	0.031 U	**0.040 J**	**0.037 J**	0.031 U	0.030 U	**0.039 J B**	0.033 U	0.031 U	**0.040 J**	0.031 U
0.084 U	0.081 U	0.085 U	0.085 U	0.094 U	0.082 U	0.084 U	0.090 U	0.085 U	0.084 U	0.085 U	0.083 U	0.082 U	0.086 U	0.084 U	0.083 U	0.092 U	0.085 U	0.086 U	0.087 U
0.046 U	0.044 U	0.046 U	0.046 U	0.051 U	0.045 U	0.046 U	0.049 U	0.046 U	0.046 U	0.046 U	0.045 U	0.045 U	0.047 U	0.046 U	0.045 U	0.050 U	0.046 U	0.047 U	0.047 U
0.032 U	0.031 U	0.032 U	0.032 U	0.035 U	0.031 U	0.032 U	0.034 U	0.032 U	0.031 U	0.032 U	0.031 U	0.031 U	0.033 U	0.032 U	0.031 U	0.035 U	0.032 U	0.032 U	0.033 U
0.094 U	0.091 U	0.094 U	0.095 U	0.10 U	0.091 U	0.094 U	0.10 U	0.095 U	0.093 U	**0.15 J**	0.092 U	0.092 U	0.097 U	0.094 U	0.093 U	**0.15 J**	0.095 U	**0.16 J**	0.097 U
0.039 U	0.038 U	0.040 U	0.040 U	0.044 U	0.038 U	0.039 U	0.042 U	0.040 U	0.039 U	0.040 U	0.039 U	0.038 U	0.040 U	0.039 U	0.039 U	0.043 U	0.040 U	0.040 U	0.040 U
0.024 U	0.023 U	0.024 U	0.024 U	0.027 U	0.023 U	0.024 U	0.026 U	0.024 U	0.024 U	0.024 U	0.024 U	0.023 U	0.025 U	0.024 U	0.024 U	0.026 U	0.024 U	0.025 U	0.025 U
0.039 U	0.038 U	0.040 U	0.040 U	0.044 U	0.038 U	0.039 U	0.042 U	0.040 U	0.039 U	0.040 U	0.039 U	0.038 U	0.040 U	0.039 U	0.039 U	0.043 U	0.040 U	0.040 U	0.040 U
0.073 U	0.071 U	0.074 U	0.074 U	0.081 U	0.071 U	0.073 U	0.078 U	0.074 U	0.073 U	0.074 U	0.072 U	0.072 U	0.075 U	0.073 U	0.073 U	0.080 U	0.074 U	0.075 U	0.075 U
0.056 U	0.054 U	0.056 U	0.056 U	0.062 U	0.054 U	0.056 U	0.059 U	0.056 U	0.055 U	0.056 U	0.055 U	0.054 U	0.057 U	0.056 U	0.055 U	0.061 U	0.056 U	0.057 U	0.057 U
0.059 U	0.057 U	0.059 U	0.059 U	0.066 U	0.057 U	0.059 U	0.063 U	0.059 U	0.059 U	0.059 U	0.058 U	0.058 U	0.061 U	0.059 U	0.058 U	0.064 U	0.060 U	0.060 U	0.061 U
0.027 U	0.026 U	0.027 U	0.027 U	0.030 U	0.027 U	0.027 U	0.029 U	0.027 U	0.027 U	0.027 U	0.027 U	0.027 U	0.028 U	0.027 U	0.027 U	0.030 U	0.028 U	0.028 U	0.028 U
0.034 U	0.033 U	0.034 U	0.034 U	0.038 U	0.033 U	0.034 U	0.036 U	0.034 U	0.034 U	0.034 U	0.033 U	0.033 U	0.035 U	0.034 U	0.034 U	0.037 U	0.034 U	0.035 U	0.035 U
0.038 U	0.037 U	0.038 U	0.038 U	0.043 U	0.037 U	0.038 U	0.041 U	0.038 U	0.038 U	0.038 U	0.038 U	0.037 U	0.039 U	0.038 U	0.038 U	0.042 U	0.039 U	0.039 U	0.039 U
0.22 U	0.21 U	0.22 U	0.22 U	0.24 U	0.21 U	0.22 U	0.23 U	0.22 U	0.22 U	**0.43 J**	0.21 U	0.21 U	**0.22 J**	**3.71 F1**	**1.40**	**0.24 J**	**0.31 J**	0.22 U	0.22 U
0.043 U	0.041 U	0.043 U	0.043 U	0.047 U	0.041 U	0.043 U	0.045 U	0.043 U	0.042 U	0.043 U	0.042 U	0.042 U	0.044 U	0.042 U	0.042 U	0.046 U	0.043 U	0.044 U	0.044 U
0.090 U	0.086 U	0.090 U	0.090 U	0.10 U	0.087 U	0.089 U	0.096 U	0.090 U	0.089 U	0.090 U	0.088 U	0.088 U	0.092 U	0.089 U	0.089 U	0.098 U	0.091 U	0.092 U	0.092 U
0.43 U	0.41 U	0.43 U	0.43 U	0.47 U	0.41 U	0.43 U	0.45 U	0.43 U	0.42 U	0.43 U	0.42 U	0.42 U	0.44 U	0.42 U	0.42 U	0.46 U	0.43 U	0.44 U	0.44 U
0.41 U	0.39 U	0.41 U	0.41 U	0.45 U	0.39 U	0.40 U	0.43 U	0.41 U	0.40 U	0.41 U	0.40 U	0.39 U	0.42 U	0.40 U	0.40 U	0.44 U	0.41 U	0.41 U	0.42 U
0.16 U	0.16 U	0.16 U	0.16 U	0.18 U	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.18 U	0.17 U	0.17 U	0.17 U
0.27 U	0.26 U	0.27 U	0.27 U	0.30 U	0.27 U	0.27 U	0.29 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.28 U	0.27 U	0.27 U	0.30 U	0.28 U	0.28 U	0.28 U

Table 1F
Summary of Soil Sampling Results
PFAS
Cottage - Garden Auto Repair

460-181391-20 S-26 (8-8.5) 5/7/2019 1:36 PM	460-181391-37 S-26 (13-13.5) 5/7/2019 1:35 PM	460-181391-12 S-26 (18.5-19) 5/7/2019 1:50 PM	460-181391-13 S-26 (22.5-23) 5/7/2019 2:00 PM
0.030 U	0.031 U	0.030 U	0.030 U
0.083 U	0.084 U	0.081 U	0.082 U
0.045 U	0.046 U	0.044 U	0.045 U
0.031 U	0.032 U	0.031 U	0.031 U
0.092 U	0.094 U	0.091 U	0.092 U
0.039 U	0.039 U	0.038 U	0.038 U
0.024 U	0.024 U	0.023 U	0.023 U
0.039 U	0.039 U	0.038 U	0.038 U
0.072 U	0.073 U	0.071 U	0.071 U
0.055 U	0.056 U	0.054 U	0.054 U
0.058 U	0.059 U	0.057 U	0.058 U
0.027 U	0.027 U	0.026 U	0.027 U
0.033 U	0.034 U	0.033 U	0.033 U
0.038 U	0.038 U	0.037 U	0.037 U
0.21 U	0.22 U	0.21 U	0.21 U
0.042 U	0.043 U	0.041 U	0.042 U
0.088 U	0.089 U	0.087 U	0.087 U
0.42 U	0.43 U	0.41 U	0.42 U
0.40 U	0.40 U	0.39 U	0.39 U
0.16 U	0.16 U	0.16 U	0.16 U
0.27 U	0.27 U	0.26 U	0.27 U

Table 2A
Summary of Groundwater Sampling Results
Volatile Organic Compounds (8260)
Cottage - Garden Auto Repair

Analyte	Units	NYSDEC AWQS	460-182234-1 MW-1 5/15/2019 1:40 PM	460-182234-2 MW-2 5/15/2019 11:05 AM	460-182295-1 MW-3S 5/17/2019 9:10 AM	460-182225-2 MW-3D 5/16/2019 1:00 PM	460-182225-3 MW-4 5/16/2019 3:20 PM	460-182225-1 MW-5 5/16/2019 8:35 AM
1,1,1-Trichloroethane	ug/L	5	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
1,1,2,2-Tetrachloroethane	ug/L	5	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U
1,1,2-Trichloroethane	ug/L	1	0.43 U	0.43 U	0.43 U	0.43 U	**1.3**	0.43 U
1,1-Dichloroethane	ug/L	5	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
1,1-Dichloroethene	ug/L	5	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
1,2,3-Trichlorobenzene	ug/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
1,2,4-Trichlorobenzene	ug/L	5	0.37 U	0.37 U	0.37 U *	0.37 U	0.37 U	0.37 U
1,2-Dibromo-3-Chloropropane	ug/L	0.04	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
1,2-Dibromoethane	ug/L	0.0006"	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U
1,2-Dichlorobenzene	ug/L	3	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U
1,2-Dichloroethane	ug/L	0.6	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U
1,2-Dichloropropane	ug/L	5	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U	0.35 U
1,3-Dichlorobenzene	ug/L	3	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
1,4-Dichlorobenzene	ug/L	3	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
2-Butanone	ug/L	50	1.9 U	1.9 U	**2.6 J ***	1.9 U	1.9 U	1.9 U
2-Hexanone	ug/L	50	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
4-Methyl-2-pentanone	ug/L		2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U
Acetone	ug/L	50	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**25**
Benzene	ug/L	1	0.43 U	0.43 U	**1.1**	0.43 U	0.43 U	0.43 U
Bromochloromethane	ug/L	5	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U
Bromodichloromethane	ug/L	50	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
Bromoform	ug/L	50	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Bromomethane	ug/L	5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	ug/L	60	0.16 U	0.16 U	**0.39 J**	0.16 U	0.16 U	0.16 U
Carbon tetrachloride	ug/L	5	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Chlorobenzene	ug/L	5	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Chloroethane	ug/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloroform	ug/L	7	0.33 U	0.33 U	**0.38 J**	**0.59 J**	0.33 U	0.33 U
Chloromethane	ug/L	5	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
cis-1,2-Dichloroethene	ug/L	5	0.22 U	0.22 U	**0.26 J**	0.22 U	0.22 U	0.22 U
cis-1,3-Dichloropropene	ug/L		0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U
Cyclohexane	ug/L		0.32 U	0.32 U	**1.1**	0.32 U	0.32 U	0.32 U
Dibromochloromethane	ug/L	50	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Dichlorodifluoromethane	ug/L	5	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Ethylbenzene	ug/L	5	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U
Freon TF	ug/L	5	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Isopropylbenzene	ug/L	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U
m&p-Xylene	ug/L		0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U
Methyl acetate	ug/L		0.31 U	0.31 U	0.31 U	0.31 U	0.31 U	0.31 U
Methylcyclohexane	ug/L		0.26 U	0.26 U	**0.45 J**	0.26 U	0.26 U	0.26 U
Methylene Chloride	ug/L	5	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	**5.4**
MTBE	ug/L	10	0.47 U	0.47 U	0.47 U	**5.5**	**29**	0.47 U
o-Xylene	ug/L	5	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U
Styrene	ug/L	5	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
Tetrachloroethene	ug/L	5	0.25 U	0.25 U	**0.89 J**	0.25 U	**1.3**	**0.51 J**
Toluene	ug/L	5	0.38 U	0.38 U	0.38 U	**0.46 J**	0.38 U	0.38 U
trans-1,2-Dichloroethene	ug/L	5	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
trans-1,3-Dichloropropene	ug/L		0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Trichloroethene	ug/L	5	0.31 U	0.31 U	**9.8**	**1.0**	**8.8**	**0.75 J**
Trichlorofluoromethane	ug/L	5	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Vinyl chloride	ug/L	2	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U

Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 2B
Summary of Groundwater Sampling Results
Semi Volatile Organic Compounds (8270)
Cottage - Garden Auto Repair

Analyte	Units	NYSDEC AWQS	460-182234-1 MW-1 5/15/2019 1:40 PM	460-182234-2 MW-2 5/15/2019 11:05 AM	460-182295-1 MW-3S 5/17/2019 9:10 AM	460-182225-2 MW-3D 5/16/2019 1:00 PM	460-182225-3 MW-4 5/16/2019 3:20 PM	460-182225-1 MW-5 5/16/2019 8:35 AM
1,2,4,5-Tetrachlorobenzene	ug/L	5	1.2 U H	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane	ug/L		0.016 U	0.016 U	**0.27**	0.016 U	**0.58**	**0.57**
2,2'-oxybis[1-chloropropane]	ug/L	5	0.63 U H	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
2,3,4,6-Tetrachlorophenol	ug/L		0.75 U H	0.75 U *	0.75 U	0.75 U	0.75 U	0.75 U
2,3,7,8-TCDD	ug/L	7E-07[a]	1.0 U H	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	ug/L		0.28 U H	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
2,4,6-Trichlorophenol	ug/L		0.30 U H	0.30 U *	0.30 U	0.30 U	0.30 U	0.30 U
2,4-Dichlorophenol	ug/L	5	0.42 U H	0.42 U	0.42 U	0.42 U	0.42 U	0.42 U
2,4-Dimethylphenol	ug/L	1	0.24 U H	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
2,4-Dinitrophenol	ug/L	1	14 U H	14 U *	14 U	14 U	14 U	14 U
2,4-Dinitrotoluene	ug/L	5	1.0 U H	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,6-Dinitrotoluene	ug/L	5	0.39 U H	0.39 U	0.39 U	0.39 U	0.39 U	0.39 U
2-Chloronaphthalene	ug/L	10	1.2 U H	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
2-Chlorophenol	ug/L		0.38 U H	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
2-Methylnaphthalene	ug/L		1.1 U H	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
2-Methylphenol	ug/L		0.26 U H	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
2-Nitroaniline	ug/L	5	0.47 U H	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
2-Nitrophenol	ug/L		0.75 U H	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
3,3'-Dichlorobenzidine	ug/L	5	1.4 U H	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
3-Nitroaniline	ug/L	5	0.96 U H	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U
4,6-Dinitro-2-methylphenol	ug/L		0.38 U	0.38 U	0.38 U *	0.38 U	0.38 U	0.38 U
4-Bromophenyl phenyl ether	ug/L		0.75 U H	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
4-Chloro-3-methylphenol	ug/L		0.58 U H	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
4-Chloroaniline	ug/L	5	1.9 U H	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
4-Chlorophenyl phenyl ether	ug/L		1.3 U H	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
4-Methylphenol	ug/L		0.24 U H	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
4-Nitroaniline	ug/L	5	0.54 U H	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
4-Nitrophenol	ug/L		0.69 U H	0.69 U *	0.69 U	0.69 U	0.69 U	0.69 U
Acenaphthene	ug/L	20	1.1 U H	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Acenaphthylene	ug/L		0.82 U H	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Acetophenone	ug/L		0.79 U H	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
Anthracene	ug/L	50	0.63 U H	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U
Atrazine	ug/L	7.5	1.3 U H	1.3 U	1.3 U *	1.3 U	1.3 U	1.3 U
Benzaldehyde	ug/L		0.59 U H	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
Benzo[a]anthracene	ug/L	0.002	0.016 U	0.016 U	0.016 U	0.016 U	**0.017 J**	0.016 U
Benzo[a]pyrene	ug/L		0.022 U	0.022 U	0.022 U	0.022 U	0.022 U	0.022 U
Benzo[b]fluoranthene	ug/L	0.002	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U	0.024 U
Benzo[g,h,i]perylene	ug/L		1.4 U H	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Benzo[k]fluoranthene	ug/L	0.002[a]	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U
Bis(2-chloroethoxy)methane	ug/L	5	0.24 U H	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
Bis(2-chloroethyl)ether	ug/L	1	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U	0.026 U
Bis(2-ethylhexyl) phthalate	ug/L	5	1.7 U H	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Butyl benzyl phthalate	ug/L	50	0.85 U H	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Caprolactam	ug/L		0.68 U H	0.68 U	0.68 U *	0.68 U	0.68 U	0.68 U
Carbazole	ug/L		0.68 U H	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
Chrysene	ug/L	0.002[a]	0.91 U H	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Dibenz(a,h)anthracene	ug/L		0.011 U *	0.011 U *	0.011 U	0.011 U *	0.011 U *	0.011 U *
Dibenzofuran	ug/L		1.1 U H	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Diethyl phthalate	ug/L	50	0.98 U H	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
Dimethyl phthalate	ug/L	50	0.77 U H	0.77 U	0.77 U	0.77 U	0.77 U	0.77 U
Di-n-butyl phthalate	ug/L	50	0.84 U H	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U
Di-n-octyl phthalate	ug/L	50	4.8 U H	4.8 U	4.8 U	4.8 U	4.8 U	4.8 U
Diphenyl	ug/L	5	1.2 U H	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Fluoranthene	ug/L		0.84 U H	0.84 U	0.84 U	0.84 U	0.84 U	0.84 U
Fluorene	ug/L	50	0.91 U H	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Hexachlorobenzene	ug/L	0.04	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
Hexachlorobutadiene	ug/L	0.5[a]	0.78 U H	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Hexachlorocyclopentadiene	ug/L	5	1.7 U H	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Hexachloroethane	ug/L	5	1.2 U H	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Indeno[1,2,3-cd]pyrene	ug/L	0.002	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U
Isophorone	ug/L		0.80 U H	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Naphthalene	ug/L	10	1.1 U H	1.1 U	**2.5 J**	1.1 U	1.1 U	1.1 U
Nitrobenzene	ug/L	0.4[a]	0.57 U H	0.57 U	0.57 U	0.57 U	0.57 U	0.57 U
N-Nitrosodimethylamine	ug/L		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
N-Nitrosodi-n-propylamine	ug/L		0.43 U H	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U
N-Nitrosodiphenylamine	ug/L	50	0.89 U H	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U
Pentachlorophenol	ug/L	1	0.15 U	0.15 U	**0.62 ***	0.15 U	0.15 U	0.15 U
Phenanthrene	ug/L	50	0.58 U H	0.58 U	0.58 U	0.58 U	0.58 U	0.58 U
Phenol	ug/L		0.29 U H	0.29 U	0.29 U	0.29 U	0.29 U	0.29 U
Pyrene	ug/L	50	1.6 U H	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U

Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 2C
Summary of Groundwater Sampling Results
Metals (6010)
Cottage - Garden Auto Repair

Analyte	Units	NYSDEC AWQS	NYSDEC AWQS Effluent Limitations	460-182234-1 MW-1 5/15/2019 1:40 PM	460-182234-2 MW-2 5/15/2019 11:05 AM	460-182295-1 MW-3S 5/17/2019 9:10 AM	460-182225-2 MW-3D 5/16/2019 1:00 PM	460-182225-3 MW-4 5/16/2019 3:20 PM	460-182225-1 MW-5 5/16/2019 8:35 AM
Aluminum	ug/L		2000	**2990**	**1170**	**3280**	**1880**	**778**	**1830**
Antimony	ug/L	3	6	**0.76 J**	**0.73 J**	**0.94 J**	**1.0 J**	**0.97 J**	**1.8 J**
Arsenic	ug/L	25	50	0.73 U	0.73 U	**0.89 J**	0.73 U	**0.79 J**	0.73 U
Barium	ug/L	1000	2000	**184**	**112**	**175**	**73.3**	**152**	**155**
Beryllium	ug/L	3		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Cadmium	ug/L	5	10	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
Calcium	ug/L			**135000**	**96200**	**291000**	**62200**	**151000**	**184000**
Chromium	ug/L	50	100	**8.6**	**4.0**	**10.6**	**8.4**	**102**	**4.7**
Cobalt	ug/L			**5.8**	**3.8 J**	**17.1**	**1.8 J**	**82.6**	**3.2 J**
Copper	ug/L	200	400	**25.0**	**2.8 J**	**14.2**	**8.7**	**3.6 J**	**4.3**
Cyanide, Total	mg/L	0.2	400	**0.015**	0.0040 U F1	**0.041**	0.0040 U	**0.085**	0.0040 U
Iron	ug/L	300	600	**4450**	**1680**	**4710**	**3370**	**1090**	**2610**
Lead	ug/L	25	50	**1.2**	0.55 U	**1.8**	**1.6**	**0.66 J**	**5.4**
Magnesium	ug/L	35000		**62200**	**34200**	**173000**	**32400**	**60400**	**69100**
Manganese	ug/L	300	600	**481**	**245**	**1380**	**534**	**649**	**372**
Mercury	ug/L	0.7	1.4	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Nickel	ug/L	100	200	**12.4**	**6.6**	**32.5**	**10.6**	**17.2**	**5.7**
Potassium	ug/L			**10700**	**8090**	**20200**	**15800**	**21600**	**14200**
Selenium	ug/L	10	20	**5.5 J**	**6.2 J**	**6.6 J**	5.4 U	**13.7**	5.4 U
Silver	ug/L	50	100	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U	0.59 U
Sodium	ug/L	20000		**94400**	**39600**	**203000**	**33100**	**133000**	**151000**
Thallium	ug/L	0.5		0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Vanadium	ug/L			**8.9**	**4.7**	**8.9**	**4.1**	**2.7 J**	**4.8**
Zinc	ug/L	2000	5000	**15.1 J**	11.1 U	**24.3**	**11.9 J**	11.1 U	11.1 U

Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 2D
Summary of Groundwater Sampling Results
Pesticides (8081)
Cottage - Garden Auto Repair

Analyte	Units	NYSDEC AWQS	460-182234-1 MW-1 5/15/2019 1:40 PM	460-182234-2 MW-2 5/15/2019 11:05 AM	460-182295-1 MW-3S 5/17/2019 9:10 AM	460-182225-2 MW-3D 5/16/2019 1:00 PM	460-182225-3 MW-4 5/16/2019 3:20 PM	460-182225-1 MW-5 5/16/2019 8:35 AM
4,4'-DDD	ug/L	0.3	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U
4,4'-DDE	ug/L	0.2	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U
4,4'-DDT	ug/L	0.2	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Aldrin	ug/L		0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U
alpha-BHC	ug/L	0.01	0.0070 U	0.0070 U	0.0070 U	0.0070 U	0.0070 U	0.0070 U
beta-BHC	ug/L	0.04	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Chlordane (n.o.s.)	ug/L		0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
cis-Chlordane	ug/L		0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U
delta-BHC	ug/L	0.04	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Dieldrin	ug/L	0.004	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U
Endosulfan I	ug/L		0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U
Endosulfan II	ug/L		0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Endosulfan sulfate	ug/L		0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U	0.0060 U
Endosulfan, Total	ug/L		0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U
Endrin	ug/L		0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Endrin aldehyde	ug/L	5	0.0080 U	0.0080 U	0.0080 U	0.0080 U	0.0080 U	0.0080 U
Endrin ketone	ug/L	5	0.0080 U	0.0080 U	0.0080 U	0.0080 U	0.0080 U	0.0080 U
gamma-BHC (Lindane)	ug/L	0.05	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
Heptachlor	ug/L	0.04	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U
Heptachlor epoxide	ug/L	0.03	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Methoxychlor	ug/L	35	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U
Toxaphene	ug/L	0.06[a]	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
trans-Chlordane	ug/L		0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U

Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 2E
Summary of Groundwater Sampling Results
PCBs (8082)
Cottage - Garden Auto Repair

Analyte	Units	NYSDEC AWQS	460-182234-1 MW-1 5/15/2019 1:40 PM	460-182234-2 MW-2 5/15/2019 11:05 AM	460-182295-1 MW-3S 5/17/2019 9:10 AM	460-182225-2 MW-3D 5/16/2019 1:00 PM	460-182225-3 MW-4 5/16/2019 3:20 PM	460-182225-1 MW-5 5/16/2019 8:35 AM
Aroclor 1016	ug/L		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor 1221	ug/L		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor 1232	ug/L		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor 1242	ug/L		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor 1248	ug/L		0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
Aroclor 1254	ug/L		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Aroclor 1260	ug/L		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Aroclor 1268	ug/L		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Aroclor-1262	ug/L		0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Polychlorinated biphenyls, Total	ug/L	0.09[a]	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U

Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 2F
Summary of Groundwater Sampling Results
PFAS/PFOS
Cottage - Garden Auto Repair

Analyte	Units	460-182234-1 MW-1 5/15/2019 1:40 PM	460-182234-2 MW-2 5/15/2019 11:05 AM	460-182295-1 MW-3S 5/17/2019 9:10 AM	460-182225-2 MW-3D 5/16/2019 1:00 PM	460-182225-3 MW-4 5/16/2019 3:20 PM	460-182225-1 MW-5 5/16/2019 8:35 AM
Perfluorobutanoic acid (PFBA)	ng/L	**3.82**	**28.5**	**14.8**	**4.53**	**9.91**	**32.7**
Perfluoropentanoic acid (PFPeA)	ng/L	**3.86**	**28.4**	**24.5**	**4.18**	**3.84**	**42.9**
Perfluorohexanoic acid (PFHxA)	ng/L	**3.88**	**23.0**	**18.5**	**7.26**	**4.58**	**37.2**
Perfluoroheptanoic acid (PFHpA)	ng/L	**4.94**	**10.1**	**8.25**	**3.15**	**2.25**	**18.0**
Perfluorooctanoic acid (PFOA)	ng/L	**15.9**	**19.3**	**7.27**	**8.78**	**12.7**	**35.7**
Perfluorononanoic acid (PFNA)	ng/L	**0.48 J**	**1.47 J**	**0.75 J**	**0.63 J**	**0.78 J**	**3.49**
Perfluorodecanoic acid (PFDA)	ng/L	0.29 U	0.29 U	0.30 U	**0.54 J**	0.29 U	0.30 U
Perfluoroundecanoic acid (PFUnA)	ng/L	1.03 U	1.02 U	1.08 U	1.09 U	1.04 U	1.05 U
Perfluorododecanoic acid (PFDoA)	ng/L	0.51 U	0.51 U	0.54 U	0.54 U	0.52 U	0.53 U
Perfluorotridecanoic acid (PFTriA)	ng/L	1.22 U	1.21 U	1.27 U	1.29 U	1.23 U	1.24 U
Perfluorotetradecanoic acid (PFTeA)	ng/L	0.27 U	0.27 U	0.28 U	0.29 U	0.27 U	0.28 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	**2.21**	**2.41**	**2.60**	**1.07 J**	**1.94**	**11.6**
Perfluorohexanesulfonic acid (PFHxS)	ng/L	**5.12 B**	**1.90 B**	**7.75 B**	**9.63 B**	**5.66 B**	**3.35 B**
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	**0.38 J**	**0.42 J**	0.19 U	**0.28 J**	**1.33 J**	**0.48 J**
Perfluorooctanesulfonic acid (PFOS)	ng/L	**7.68**	**21.0**	**18.9**	**11.6**	**72.3**	**15.6**
Perfluorodecanesulfonic acid (PFDS)	ng/L	0.30 U	0.30 U	0.31 U	0.32 U	0.30 U	0.31 U
Perfluorooctanesulfonamide (FOSA)	ng/L	0.33 U	0.33 U	0.34 U	0.35 U	0.33 U	0.33 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	2.90 U	2.89 U	3.04 U	3.07 U	2.93 U	2.96 U
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	1.78 U	1.77 U	1.86 U	1.88 U	1.80 U	1.82 U
6:2 FTS	ng/L	**5.39 J**	**9.71 J**	**2.69 J**	**15.2 J**	1.89 U	**3.15 J**
8:2 FTS	ng/L	1.87 U	1.86 U	1.96 U	1.98 U	1.89 U	1.91 U

Notes:

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Table 3.1
Well gauging and Surveying Data
May 2019
14 le Count Standard Printing
New Rochelle, NY

Well No.	Elevation Top of Casing (ft-msl) *	Depth to Water (ft) From Top of Casing	Groundwater Elevation (ft-msl)
MW-2	119.93	11.78	108.15
MW-3	121.45	18.15	103.3
MW-4	121.61	17.42	104.19
MW-5	120.52	16.47	104.05
MW-6	120.79	14.45	106.34

Table 4.1
Summary of Soil Vapor Data
Volatile Organic Compounds
Cottage - Garden Auto Repair

Analyte	CAS Number	NYSDOH Vapor Threshold Concentrations	200-48691-1 SV-1 5/8/2019 12:53 PM	200-48691-2 SV-2 5/8/2019 2:10 PM	200-48691-3 SV-3 5/8/2019 1:18 PM	200-48691-4 SV-4 5/8/2019 2:05 PM	200-48691-5 SV-5 5/8/2019 1:00 PM	200-48691-6 SV-6 5/8/2019 1:33 PM	200-50750-1 SV-7 9/27/2019 11:58 AM	200-50750-2 SV-8 9/27/2019 12:10 PM
Ethylbenzene	100-41-4		9 U	19 U	26 U	24 U	10 U	18 U	**230**	**8.6**
Styrene	100-42-5		9 U	19 U	26 U	23 U	10 U	17 U	3.7 U	3.7 U
cis-1,3-Dichloropropene	10061-01-5		9 U	20 U	27 U	25 U	11 U	19 U	4.4 U	4.4 U
trans-1,3-Dichloropropene	10061-02-6		9 U	20 U	27 U	25 U	11 U	19 U	5.4 U	5.4 U
1,4-Dichlorobenzene	106-46-7		12 U	27 U	36 U	33 U	14 U	25 U	3.9 U	3.9 U
1,2-Dibromoethane	106-93-4		15 U	34 U	46 U	42 U	18 U	32 U	5.3 U	5.3 U
1,3-Butadiene	106-99-0		**250**	**110**	**98**	**66**	**190**	**100**	**15**	**9.5**
3-Chloropropene	107-05-1		16 U	35 U	47 U	42 U	19 U	32 U	8.5 U	8.5U
1,2-Dichloroethane	107-06-2		8 U	18 U	24 U	22 U	10 U	17 U	2.5 U	2.5 U
methyl isobutyl ketone	108-10-1		20 U	45 U	62 U	56 U	25 U	42 U	15 U	15 U
1,3,5-Trimethylbenzene	108-67-8		10 U	22 U	30 U	27 U	12 U	20 U	2.9 U	2.9 U
Toluene	108-88-3		**47**	**37**	**73**	**32**	**190**	**61**	**14**	**45**
Chlorobenzene	108-90-7		9 U	20 U	28 U	25 U	11 U	19 U	**3.7 J**	1.8 U
Tetrahydrofuran	109-99-9		150 U	330 U	450 U	400 U	180 U	300 U	77 U	77 U
n-Hexane	110-54-3		**310**	**38**	**97**	**23**	**150**	**67**	**25**	**14**
Cyclohexane	110-82-7		**23**	15 U	21 U	19 U	**18**	14 U	**5.9 J**	**6.0 J**
1,2,4-Trichlorobenzene	120-82-1		37U	82 U	110 U	100 U	45 U	76 U	18 U	18 U
1,4-Dioxane	123-91-1		180 U	400 U	540 U	490 U	220 U	370 U	47 U	47 U
Dibromochloromethane	124-48-1		17 U	38 U	51 U	46 U	20 U	35 U	6.0 U	6.0 U
Tetrachloroethene	127-18-4	100	14 U	30 U	41 U	37 U	**95**	28 U	**20**	**14**
n-Heptane	142-82-5		**97**	18 U	**39**	22 U	**84**	**21**	**14**	**11**
cis-1,2-Dichloroethene	156-59-2	6	8 U	18 U	24 U	21 U	10 U	16 U	**110**	1.5 U
trans-1,2-Dichloroethene	156-60-5		8 U	18 U	24 U	21 U	10 U	16 U	2.9 U	2.9 U
Methyl tert-butyl ether	1634-04-4		7 U	16 U	22 U	20 U	9 U	15 U	2.2 U	2.2 U
m,p-Xylene	179601-23-1		**31**	48 U	66 U	59 U	**36**	45 U	**130**	**19 J**
2,2,4-Trimethylpentane	540-84-1		**14**	21 U	28 U	25 U	11 U	19 U	**8.3 J**	4.1 U
1,3-Dichlorobenzene	541-73-1		12 U	27 U	36 U	33 U	14 U	25 U	**5.3 J B**	**7.1 J**
Carbon tetrachloride	56-23-5	6	13 U	28 U	38 U	34 U	**630**	**41**	1.5 U	1.5 U
Bromoethene(Vinyl Bromide)	593-60-2		9 U	19 U	26 U	24 U	10 U	18 U	2.4 U	2.4 U
4-Ethyltoluene	622-96-8		10 U	22 U	30 U	27 U	12 U	20 U	3.4 U	3.4 U
Ethanol	64-17-5		94 U	210 U	280 U	260 U	110 U	190 U	**160**	**160**
Isopropyl alcohol	67-63-0		120 U	270 U	370 U	330 U	150 U	250 U	44 U	44 U
Acetone	67-64-1		**430**	**5700 E**	**4700 E**	**5300 E**	**2400 E**	**4400 E**	**520**	**320**
Chloroform	67-66-3		10 U	22 U	29 U	26 U	**19**	20 U	2.5 U	2.5 U
Benzene	71-43-2		**71**	**20**	**120**	17 U	**140**	**58**	**9.9**	**5.0 J**
1,1,1-Trichloroethane	71-55-6	100	11 U	24 U	33 U	30 U	13 U	22 U	**6.8 J**	**39**
Bromomethane	74-83-9		8 U	17 U	23 U	21 U	9 U	16 U	2.4 U	2.4 U
Chloromethane	74-87-3		10 U	23 U	31 U	28 U	12 U	21 U	5.2 U	5.2 U
Chloroethane	75-00-3		13 U	29 U	40 U	36 U	16 U	27 U	5.5 U	5.5 U
Vinyl chloride	75-01-4	6	5 U	11 U	15 U	14 U	6 U	10 U	1.0 U	1.0 U
Methylene Chloride	75-09-2	100	17 U	38 U	52 U	47 U	21 U	36 U	**12 J**	**6**
Carbon disulfide	75-15-0		16 U	34 U	47 U	42 U	**53**	32 U	**5.8 J**	**8.7 J**
Bromoform	75-25-2		21 U	46 U	62 U	56 U	25 U	42 U	8.9 U	8.9 U
Bromodichloromethane	75-27-4		13 U	30 U	40 U	36 U	16 U	27 U	6.3 U	6.3 U
1,1-Dichloroethane	75-34-3		8 U	18 U	24 U	22 U	10 U	17 U	**3.7 J**	1.1 U
1,1-Dichloroethene	75-35-4	6	8 U	18 U	24 U	21 U	10 U	16 U	**9.3**	1.3 U
tert-Butyl alcohol	75-65-0		150 U	330 U	460 U	410 U	180 U	310 U	45 U	45 U
Trichlorofluoromethane	75-69-4		11 U	25 U	34 U	30 U	13 U	23 U	**6.3 J**	**4.8 J**
Dichlorodifluoromethane	75-71-8		25 U	55 U	75 U	67 U	30 U	51 U	**24 J**	9.9 U
Freon TF	76-13-1		15 U	34 U	46 U	42 U	18 U	31 U	**43**	**65**
1,2-Dichlorotetrafluoroethane	76-14-2		14 U	31 U	42 U	38 U	17 U	29 U	4.8 U	4.8 U
1,2-Dichloropropane	78-87-5		9 U	20 U	28 U	25 U	11 U	19 U	5.5 U	5.5 U
Methyl Ethyl Ketone	78-93-3		**170**	**100**	**130**	**100**	**130**	**140**	**26**	**18**
1,1,2-Trichloroethane	79-00-5		11 U	24 U	33 U	30 U	13 U	22 U	4.3 U	4.3 U
Trichloroethene	79-01-6	6	11 U	**31**	32 U	29 U	**13**	**810**	**260**	**20**
1,1,2,2-Tetrachloroethane	79-34-5		14 U	30 U	41 U	37 U	16 U	28 U	5.2 U	5.2 U
Methyl methacrylate	80-62-6		20 U	45 U	62 U	55 U	25 U	42 U	9.0 U	9.0 U
Hexachlorobutadiene	87-68-3		21 U	47 U	64 U	58 U	26 U	44 U	8.7 U	8.7 U
Xylene, o-	95-47-6		**12**	19 U	26 U	24 U	**10**	18 U	**29**	**6.4 J**
2-Chlorotoluene	95-49-8		10 U	23 U	31 U	28 U	12 U	21 U	3.7 U	3.7 U
1,2-Dichlorobenzene	95-50-1		12 U	27 U	36 U	33 U	14 U	25 U	4.3 U	4.3 U
1,2,4-Trimethylbenzene	95-63-6		**18**	22 U	30 U	27 U	**15**	20 U	**5.0 J**	**4.6 J**
VOCS by TO-15 (ug/m3)										

Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

U : Indicates the analyte was analyzed for but not detected.

Table 4.1
Summary of Soil Vapor Data
Volatile Organic Compounds
Cottage - Garden Auto Repair

Analyte	CAS Number	NYSDOH Vapor Threshold Concentrations	200-50750-3 SV-9 9/27/2019 12:22 PM	200-50750-4 SV-10 9/27/2019 1:36 PM	200-50750-5 SV-11 9/27/2019 1:07 PM	200-50750-6 SV-12 9/27/2019 1:43 PM	200-50750-7 SV-13 9/27/2019 1:15 PM	200-50750-8 SV-14 9/27/2019 1:22 PM	200-50750-9 SV-15 9/27/2019 1:26 PM
Ethylbenzene	100-41-4		**27**	**4.2 J**	**8.5**	**6.9 J**	**14**	**4.2 J**	**16**
Styrene	100-42-5		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.8 U	3.7 U
cis-1,3-Dichloropropene	10061-01-5		4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.6 U	4.4 U
trans-1,3-Dichloropropene	10061-02-6		5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.6 U	5.4 U
1,4-Dichlorobenzene	106-46-7		3.9 U	3.9 U	3.9 U	3.9 U	3.9 U	4.0 U	3.9 U
1,2-Dibromoethane	106-93-4		5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
1,3-Butadiene	106-99-0		**110**	**89**	**4.5**	**89**	**120**	**5.7**	**1.8 J**
3-Chloropropene	107-05-1		8.5U	8.5 U	8.5 U	8.5 U	8.5 U	8.7 U	8.5 U
1,2-Dichloroethane	107-06-2		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.6 U	2.5 U
methyl isobutyl ketone	108-10-1		15 U	15 U	15 U	15 U	15 U	15 U	15 U
1,3,5-Trimethylbenzene	108-67-8		2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Toluene	108-88-3		**21**	**39**	**130**	**41**	**63**	**140**	**130**
Chlorobenzene	108-90-7		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Tetrahydrofuran	109-99-9		77 U	77 U	77 U	77 U	77 U	79 U	77 U
n-Hexane	110-54-3		**88**	**55**	**230**	**60**	**160**	**38**	**21**
Cyclohexane	110-82-7		**10**	**4.7 J**	**6.4 J**	**6.2 J**	**6.7 J**	2.2 U	2.2 U
1,2,4-Trichlorobenzene	120-82-1		18 U	18 U	18 U	18 U	18 U	18 U	18 U
1,4-Dioxane	123-91-1		47 U	47 U	47 U	47 U	47 U	48 U	47 U
Dibromochloromethane	124-48-1		6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.2 U	6.0 U
Tetrachloroethene	127-18-4	100	**16**	**8.8 J**	**70**	**16**	**6.9 J**	**4.7 J**	**8.1 J**
n-Heptane	142-82-5		**39**	**16**	**22**	**28**	**34**	**9.3**	**10**
cis-1,2-Dichloroethene	156-59-2	6	**13**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
trans-1,2-Dichloroethene	156-60-5		2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	3.0 U	2.9 U
Methyl tert-butyl ether	1634-04-4		2.2 U	2.2 U	**150**	2.2 U	2.2 U	2.3 U	2.2 U
m,p-Xylene	179601-23-1		**73**	**8.9 J**	**21 J**	**17 J**	**34**	**11 J**	**53**
2,2,4-Trimethylpentane	540-84-1		**7.0 J**	**4.2 J**	**13**	4.1 U	**10**	**10**	**7.8 J**
1,3-Dichlorobenzene	541-73-1		**5.5 J**	4.9 U	**9.5 J B**	4.9 U	**5.6 J**	5.1 U	**6.6 J B**
Carbon tetrachloride	56-23-5	6	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.6 U	1.5 U
Bromoethene(Vinyl Bromide)	593-60-2		2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.5 U	2.4 U
4-Ethyltoluene	622-96-8		3.4 U	3.4 U	3.4 U	3.4 U	3.4 U	3.5 U	3.4 U
Ethanol	64-17-5		**140**	**99**	**230**	**120**	**160**	**250**	**130**
Isopropyl alcohol	67-63-0		44 U	44 U	44 U	44 U	44 U	46 U	44 U
Acetone	67-64-1		**220**	**230**	**2000 D**	**290**	**650**	**1200 D**	**720**
Chloroform	67-66-3		**18**	2.5 U	2.5 U	2.5 U	2.5 U	2.6 U	2.5 U
Benzene	71-43-2		**42**	**12**	**8.3**	**19**	**13**	**5.2 J**	**4.2 J**
1,1,1-Trichloroethane	71-55-6	100	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.8 U	3.7 U
Bromomethane	74-83-9		2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.5 U	2.4 U
Chloromethane	74-87-3		5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.3 U	5.2 U
Chloroethane	75-00-3		5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.7 U	5.5 U
Vinyl chloride	75-01-4	6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U	1.0 U
Methylene Chloride	75-09-2	100	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	7.2 U	**7.6 J**
Carbon disulfide	75-15-0		**9.3 J**	**11 J**	**240**	**54**	**60**	**52**	**38**
Bromoform	75-25-2		8.9 U	8.9 U	8.9 U	8.9 U	8.9 U	9.2 U	8.9 U
Bromodichloromethane	75-27-4		6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.5 U	6.3 U
1,1-Dichloroethane	75-34-3		1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,1-Dichloroethene	75-35-4	6	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.4 U	1.3 U
tert-Butyl alcohol	75-65-0		45 U	45 U	**87 J**	45 U	45 U	**62 J**	45 U
Trichlorofluoromethane	75-69-4		3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.6 U	3.5 U
Dichlorodifluoromethane	75-71-8		9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	10 U	9.9 U
Freon TF	76-13-1		2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.5 U	2.4 U
1,2-Dichlorotetrafluoroethane	76-14-2		4.8 U	4.8 U	4.8 U	4.8 U	4.8 U	4.9 U	4.8 U
1,2-Dichloropropane	78-87-5		5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.7 U	5.5 U
Methyl Ethyl Ketone	78-93-3		**35**	**26**	**210**	**39**	**100**	**110**	**95**
1,1,2-Trichloroethane	79-00-5		4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.4 U	4.3 U
Trichloroethene	79-01-6	6	**77**	1.6 U	**4.4 J**	**2.7 J**	**13**	1.7 U	**9.2 J**
1,1,2,2-Tetrachloroethane	79-34-5		5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.4 U	5.2 U
Methyl methacrylate	80-62-6		9.0 U	9.0 U	9.0 U	9.0 U	9.0 U	9.3 U	9.0 U
Hexachlorobutadiene	87-68-3		8.7 U	8.7 U	8.7 U	8.7 U	8.7 U	9.0 U	8.7 U
Xylene, o-	95-47-6		**19**	**3.7 J**	**6.2 J**	**6.5 J**	**9.5**	**4.0 J**	**16**
2-Chlorotoluene	95-49-8		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.8 U	3.7 U
1,2-Dichlorobenzene	95-50-1		4.3 U	4.3 U	4.3 U	4.3 U	4.3 U	4.4 U	4.3 U
1,2,4-Trimethylbenzene	95-63-6		**4.3 J**	3.9 U	**5.7 J**	**5.4 J**	3.9 U	**4.7 J**	**4.3 J**
VOCS by TO-15 (ug/m3)									

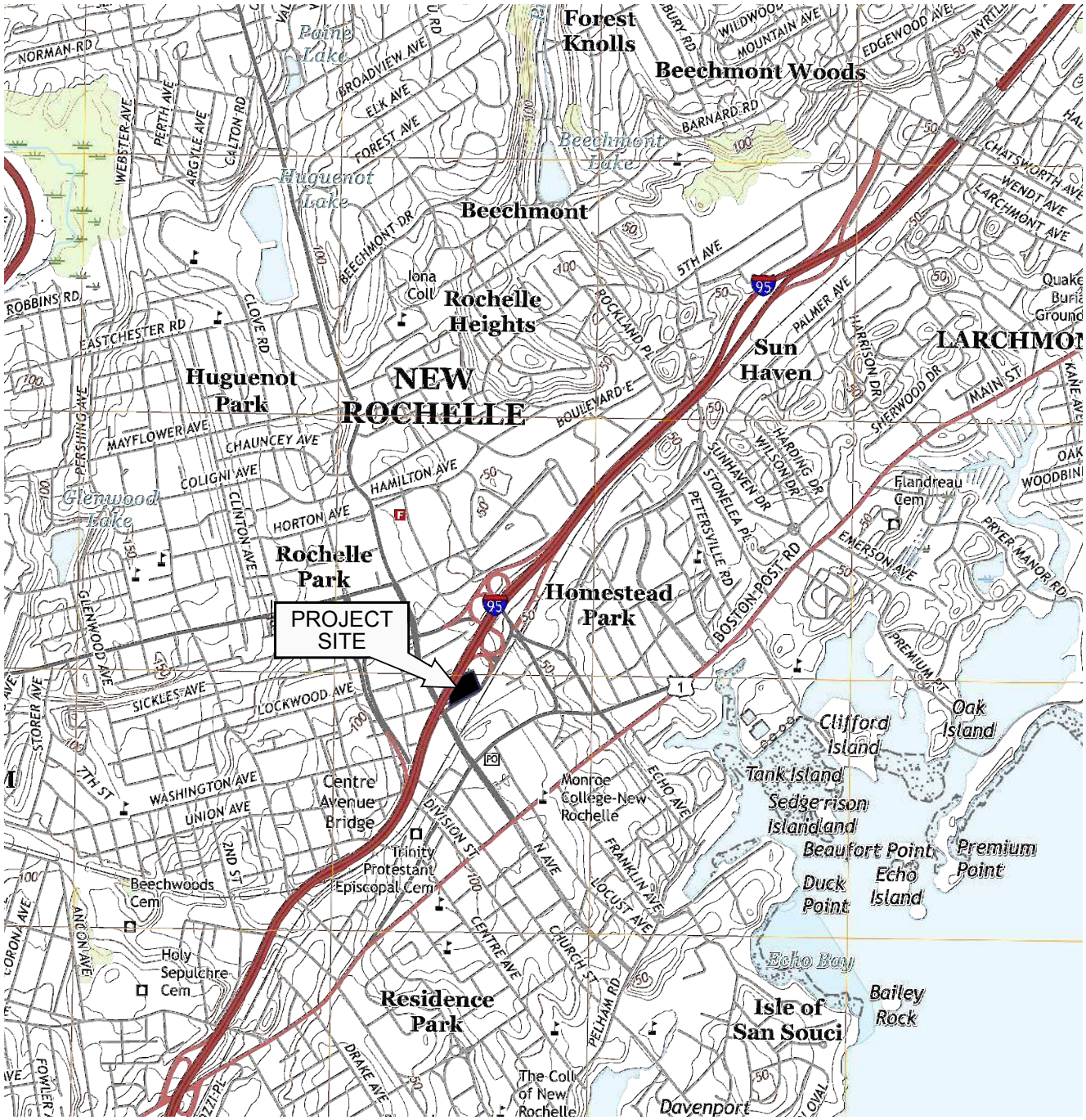
Notes:

Bold cells are detections above the MDL

Highlighted Concentrations shown in bold type face exceed limits

U : Indicates the analyte was analyzed for but not detected.

FIGURES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 18T
10 000-foot ticks: New York Coordinate System of 1983 (east and long island zones)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, June 2013
Roads..... U.S. Census Bureau, 2015 - 2016
Names.....GNIS, 2016
Hydrography.....National Hydrography Dataset, 2013
Contours.....National Elevation Dataset, 2015
Boundaries.....Multiple sources; see metadata file 1972 - 2016

Wetlands.....FWS National Wetlands Inventory 1977 - 2014

UTM GRID AND 2016 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
WL XL
Grid Zone Designation
18T

NEW YORK
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Nyack
2 White Plains
3 Glenville
4 Yonkers
5 Mamaroneck
6 Central Park
7 Flushing
8 Sea Cliff

ADJOINING QUADRANGLES

GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

SITE LOCATION MAP

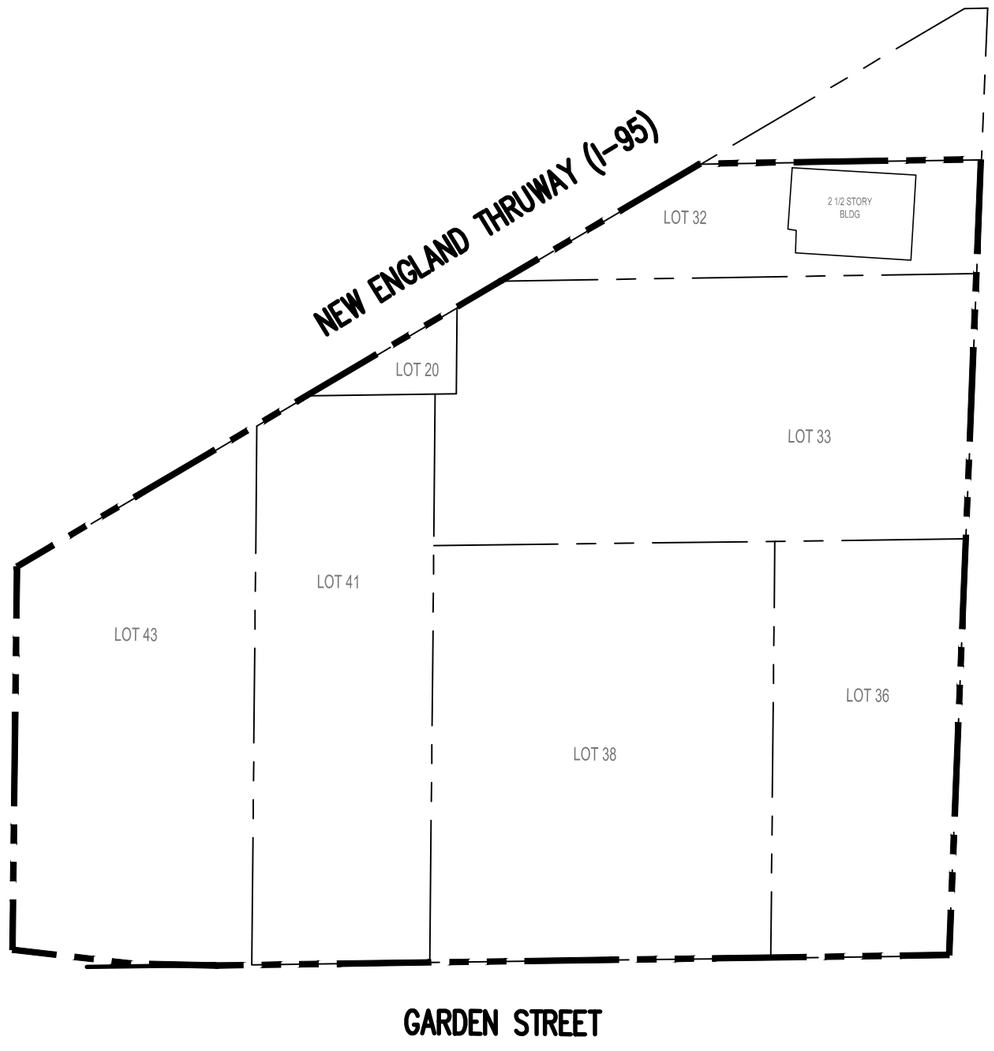
SESI CONSULTING ENGINEERS D.P.C.

SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL

12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

FIG-1.1
DRAWN BY: yy
CHECKED BY: SG
SCALE: N.T.S.
DATE: 06/06/19
JOB NO.: 10491

N:\ACAD\10491\10491 SITE LOCATION MAP.DWG 06/06/19 11:36:58AM, cad, LAYOUT:FIG-1.1



SCALE: 1"=40'

0 40 80

REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

LEGEND:
- PROPERTY BOUNDARY
- BCP SITE BOUNDARY

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

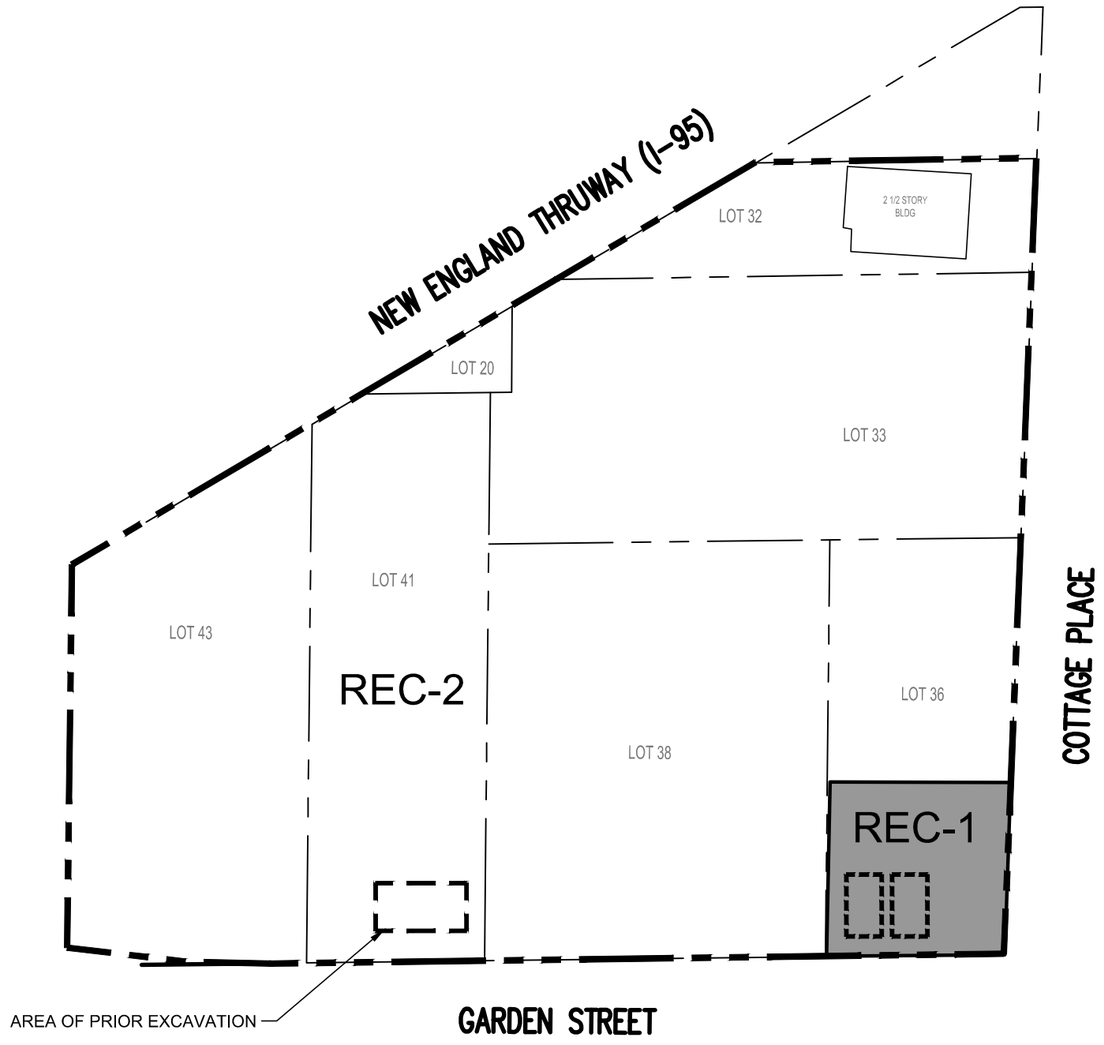
dwg by: yy
chk by: SG
scale: 1" = 40
date: 06/07/19

project:
GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title:
SITE PLAN

job no: 10491
drawing no:
FIG-1.2

N:\ACAD\10491\RAWP\10491 FIG-1.2 SITE PLAN.DWG 06/07/19 01:05:48PM, jenny, LAYOUT:FIG-1.2



SCALE: 1"=40'

0 40 80

REC-1 - UST

REC-2 - FORMER PLASTIC WORKS

REC-3 - HISTORIC FILL IS SITE-WIDE

LEGEND:

- PROPERTY BOUNDARY
- FORMER GAS STATION AREA WITH 2 ABANDONED USTS
- APPROXIMATE ABANDONED UST AREA
- BCP SITE BOUNDARY

REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

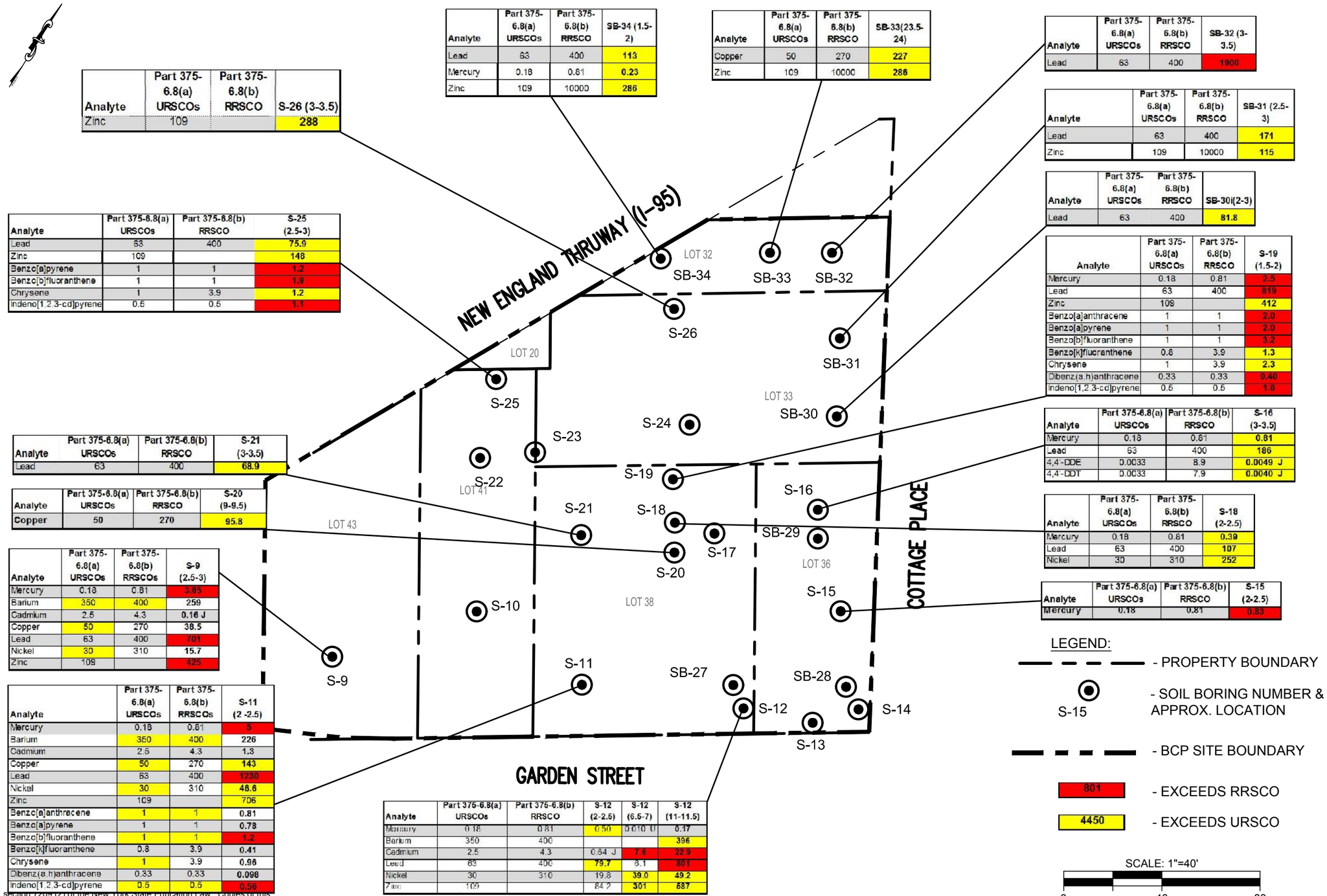
SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

dwg by: yy
chk by: SG
scale: 1" = 40
date: 06/07/19

project: GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title: REC LOCATION PLAN

job no: 10491
drawing no: FIG-2.1



Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-26 (3-3.5)
Zinc	109		288

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	SB-34 (1.5-2)
Lead	63	400	113
Mercury	0.18	0.81	0.23
Zinc	109	10000	286

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	SB-33(23.5-24)
Copper	50	270	227
Zinc	109	10000	286

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	SB-32 (3-3.5)
Lead	63	400	1900

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	SB-31 (2.5-3)
Lead	63	400	171
Zinc	109	10000	115

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	SB-30i(2-3)
Lead	63	400	81.8

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-19 (1.5-2)
Mercury	0.18	0.81	2.5
Lead	63	400	819
Zinc	109		412
Benzo[a]anthracene	1	1	2.0
Benzo[a]pyrene	1	1	2.0
Benzo[b]fluoranthene	1	1	3.2
Benzo[k]fluoranthene	0.8	3.9	1.3
Chrysene	1	3.9	2.3
Dibenz(a,h)anthracene	0.33	0.33	0.40
Indeno[1,2,3-cd]pyrene	0.5	0.5	1.6

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-16 (3-3.5)
Mercury	0.18	0.81	0.81
Lead	63	400	186
4,4-DDE	0.0033	8.9	0.0049 J
4,4-DDT	0.0033	7.9	0.0040 J

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-18 (2-2.5)
Mercury	0.18	0.81	0.39
Lead	63	400	107
Nickel	30	310	252

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-15 (2-2.5)
Mercury	0.18	0.81	0.83

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-25 (2.5-3)
Lead	63	400	75.9
Zinc	109		148
Benzo[a]pyrene	1	1	1.2
Benzo[b]fluoranthene	1	1	1.9
Chrysene	1	3.9	1.2
Indeno[1,2,3-cd]pyrene	0.5	0.5	1.1

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-21 (3-3.5)
Lead	63	400	68.9

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-20 (9-9.5)
Copper	50	270	95.8

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCOs	S-9 (2.5-3)
Mercury	0.18	0.81	3.85
Barium	350	400	259
Cadmium	2.5	4.3	0.16 J
Copper	50	270	38.5
Lead	63	400	701
Nickel	30	310	15.7
Zinc	109		425

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCOs	S-11 (2 -2.5)
Mercury	0.18	0.81	5
Barium	350	400	226
Cadmium	2.5	4.3	1.3
Copper	50	270	143
Lead	63	400	1230
Nickel	30	310	46.6
Zinc	109		706
Benzo[a]anthracene	1	1	0.81
Benzo[a]pyrene	1	1	0.78
Benzo[b]fluoranthene	1	1	1.2
Benzo[k]fluoranthene	0.8	3.9	0.41
Chrysene	1	3.9	0.96
Dibenz(a,h)anthracene	0.33	0.33	0.098
Indeno[1,2,3-cd]pyrene	0.5	0.5	0.56

Analyte	Part 375-6.8(a) URSCOs	Part 375-6.8(b) RRSCO	S-12 (2-2.5)	S-12 (6.5-7)	S-12 (11-11.5)
Mercury	0.18	0.81	0.50	0.010 U	0.17
Barium	350	400			396
Cadmium	2.5	4.3	0.64 J	7.6	22.9
Lead	63	400	79.7	8.1	801
Nickel	30	310	19.8	39.0	49.2
Zinc	109		84.2	301	687

LEGEND:

- PROPERTY BOUNDARY
- S-15 — SOIL BORING NUMBER & APPROX. LOCATION
- BCP SITE BOUNDARY
- 801 — EXCEEDS RRSCO
- 4450 — EXCEEDS URSCO

SCALE: 1"=40'

0 40 80

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

N:\ACAD\10491\RIR\10491 FIG-4.1A 2019-10-03.DWG 10/07/19 02:09:45PM, jenny, LAYOUT:FIG-4.1A

dwg by: yy
chk by: JS
scale: 1" = 40
date: 10/07/19

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SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE., PINE BROOK, N.J. 07058 PH: 973-808-9050

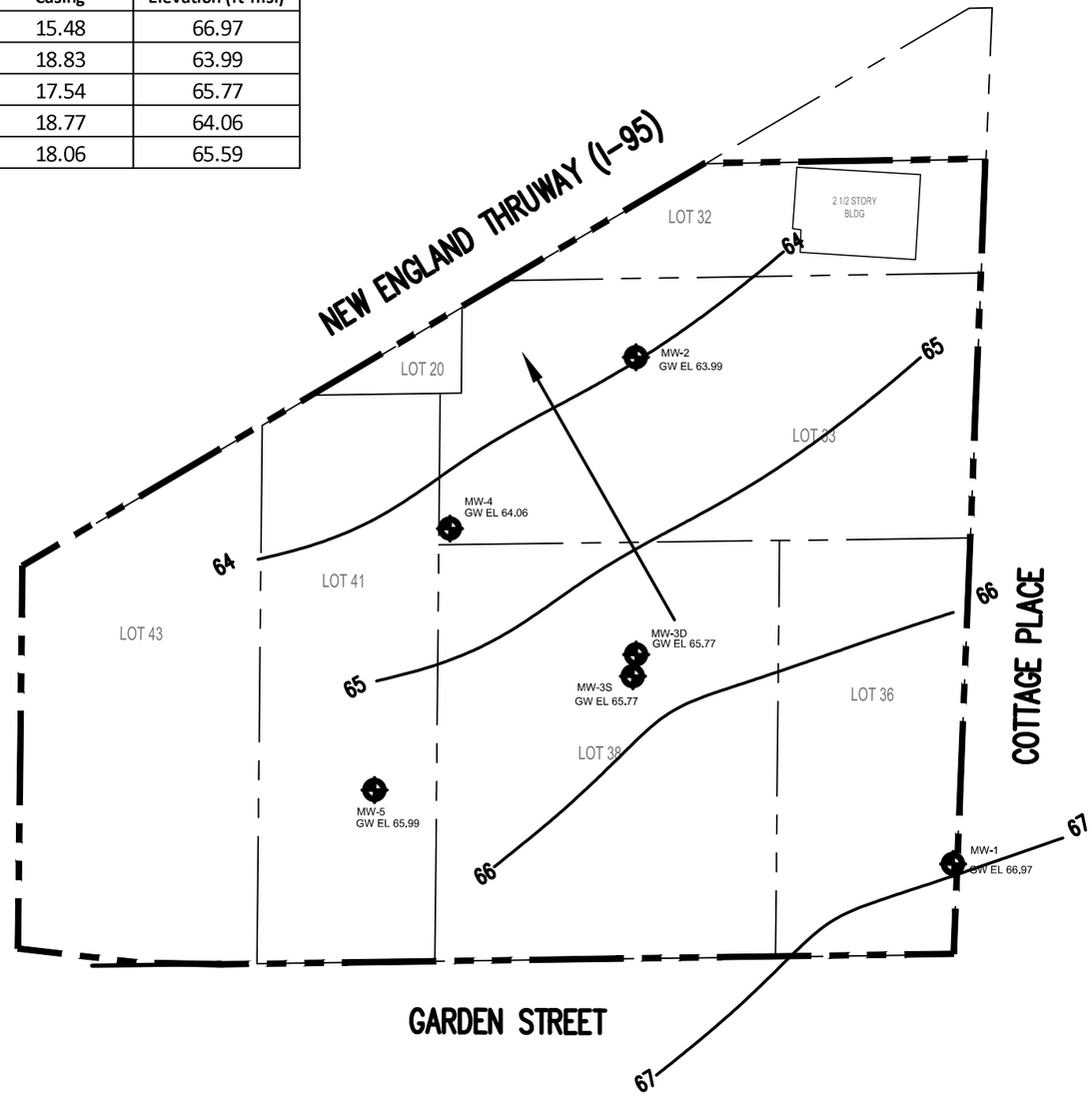
project: GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title: SOIL BORING LOCATION PLAN AND RESULTS

job no: 10491
drawing no:

FIG-2.2

Well No.	Elevation Top of Casing (ft-msl) *	Depth to Water (ft) From Top of Casing	Groundwater Elevation (ft-msl)
MW-1	82.45	15.48	66.97
MW-2	82.82	18.83	63.99
MW-3	83.31	17.54	65.77
MW-4	82.83	18.77	64.06
MW-5	83.65	18.06	65.59



LEGEND:

- PROPERTY BOUNDARY
- BCP SITE BOUNDARY
- 67 — 67 GROUNDWATER CONTOUR
- MW-1 GROUNDWATER MONITORING WELL
- GENERAL GROUNDWATER FLOW DIRECTION

SCALE: 1"=40'

0 40 80

REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

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ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

dwg by: yy
chk by: JS
scale: 1" = 40
date: 06/07/19

project:
GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title:
GROUNDWATER CONTOUR MAP

job no: 10491
drawing no:

FIG-2.3

N:\ACAD\10491\RAWP\10491 FIG-2.3 GROUNDWATER CONTOUR MAP.DWG 06/07/19 01:03:41PM, jenny, LAYOUT:FIG-2.3

Analyte	Units	NYSDEC AWQS	MW-2
1,1,2-Trichloroethane	ug/L	1	0.43 U
Benzene	ug/L	1	0.43 U
Methylene Chloride	ug/L	5	0.32 U
MTBE	ug/L	10	0.47 U
Trichloroethene	ug/L	5	0.31 U
Benzo[a]anthracene	ug/L	0.002	0.016 U
Aluminum	ug/L	2000	1170
Chromium	ug/L	100	4.0
Iron	ug/L	600	1680
Magnesium	ug/L	35000	34200
Manganese	ug/L	600	245
Selenium	ug/L	20	6.2 J
Sodium	ug/L	20000	39600

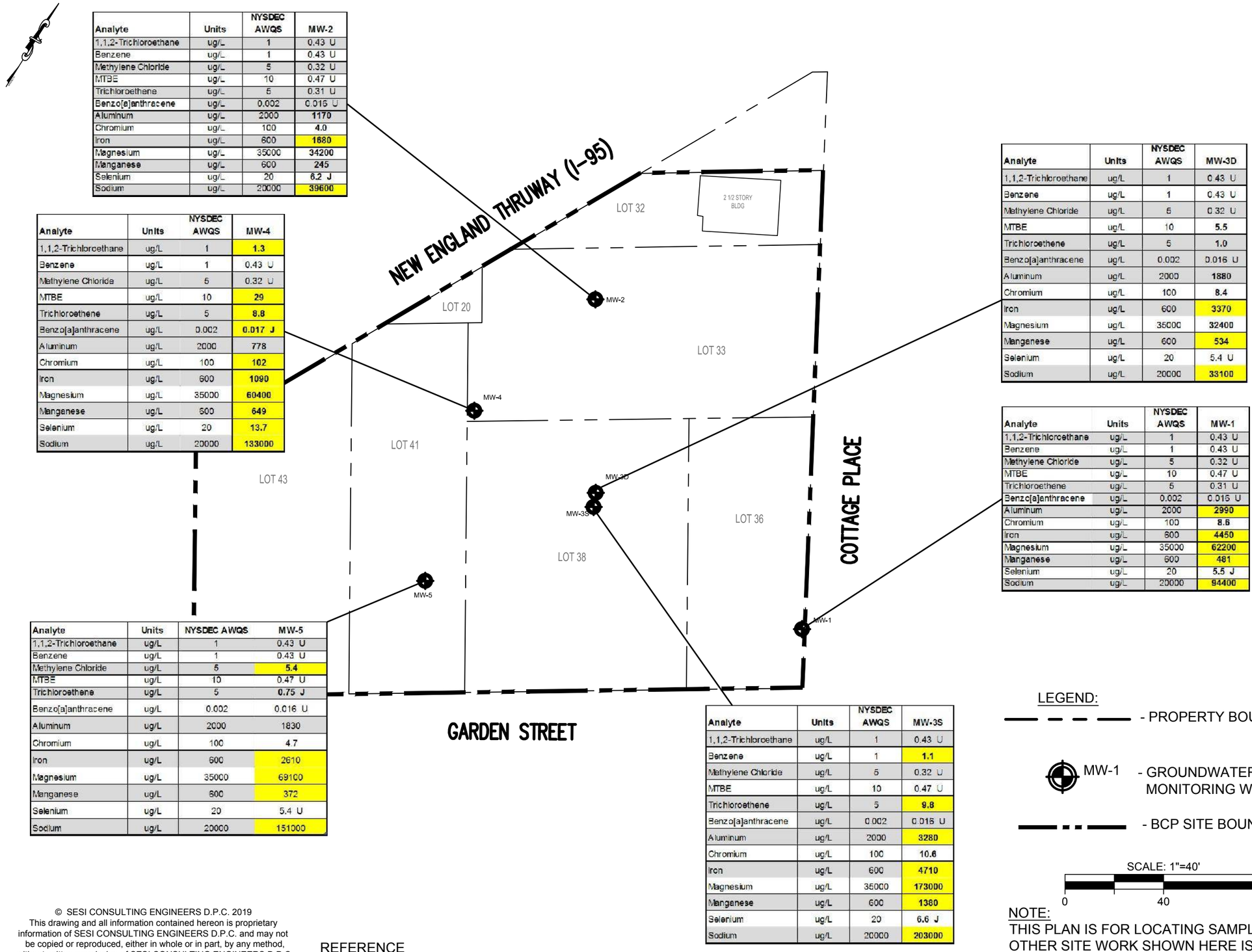
Analyte	Units	NYSDEC AWQS	MW-4
1,1,2-Trichloroethane	ug/L	1	1.3
Benzene	ug/L	1	0.43 U
Methylene Chloride	ug/L	5	0.32 U
MTBE	ug/L	10	29
Trichloroethene	ug/L	5	8.8
Benzo[a]anthracene	ug/L	0.002	0.017 J
Aluminum	ug/L	2000	778
Chromium	ug/L	100	102
Iron	ug/L	600	1090
Magnesium	ug/L	35000	60400
Manganese	ug/L	600	649
Selenium	ug/L	20	13.7
Sodium	ug/L	20000	133000

Analyte	Units	NYSDEC AWQS	MW-5
1,1,2-Trichloroethane	ug/L	1	0.43 U
Benzene	ug/L	1	0.43 U
Methylene Chloride	ug/L	5	5.4
MTBE	ug/L	10	0.47 U
Trichloroethene	ug/L	5	0.75 J
Benzo[a]anthracene	ug/L	0.002	0.016 U
Aluminum	ug/L	2000	1830
Chromium	ug/L	100	4.7
Iron	ug/L	600	2610
Magnesium	ug/L	35000	69100
Manganese	ug/L	600	372
Selenium	ug/L	20	5.4 U
Sodium	ug/L	20000	151000

Analyte	Units	NYSDEC AWQS	MW-3D
1,1,2-Trichloroethane	ug/L	1	0.43 U
Benzene	ug/L	1	0.43 U
Methylene Chloride	ug/L	5	0.32 U
MTBE	ug/L	10	5.5
Trichloroethene	ug/L	5	1.0
Benzo[a]anthracene	ug/L	0.002	0.016 U
Aluminum	ug/L	2000	1880
Chromium	ug/L	100	8.4
Iron	ug/L	600	3370
Magnesium	ug/L	35000	32400
Manganese	ug/L	600	534
Selenium	ug/L	20	5.4 U
Sodium	ug/L	20000	33100

Analyte	Units	NYSDEC AWQS	MW-1
1,1,2-Trichloroethane	ug/L	1	0.43 U
Benzene	ug/L	1	0.43 U
Methylene Chloride	ug/L	5	0.32 U
MTBE	ug/L	10	0.47 U
Trichloroethene	ug/L	5	0.31 U
Benzo[a]anthracene	ug/L	0.002	0.016 U
Aluminum	ug/L	2000	2990
Chromium	ug/L	100	8.6
Iron	ug/L	600	4450
Magnesium	ug/L	35000	62200
Manganese	ug/L	600	481
Selenium	ug/L	20	5.5 J
Sodium	ug/L	20000	94400

Analyte	Units	NYSDEC AWQS	MW-3S
1,1,2-Trichloroethane	ug/L	1	0.43 U
Benzene	ug/L	1	1.1
Methylene Chloride	ug/L	5	0.32 U
MTBE	ug/L	10	0.47 U
Trichloroethene	ug/L	5	9.8
Benzo[a]anthracene	ug/L	0.002	0.016 U
Aluminum	ug/L	2000	3280
Chromium	ug/L	100	10.6
Iron	ug/L	600	4710
Magnesium	ug/L	35000	173000
Manganese	ug/L	600	1380
Selenium	ug/L	20	6.6 J
Sodium	ug/L	20000	203000



LEGEND:

- PROPERTY BOUNDARY
- MW-1 - GROUNDWATER MONITORING WELL
- BCP SITE BOUNDARY

SCALE: 1"=40'

0 40 80

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

dwg by: yy
chk by: JS
scale: 1" = 40
date: 06/07/19

project: GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title: SAMPLING LOCATION PLAN AND CONTAMINANT DISTRIBUTION IN GROUNDWATER

job no: 10491
drawing no:

FIG-2.4

Analyte	SV-8
Ethylbenzene	8.6
1,3-Butadiene	9.5
Toluene	45
n-Hexane	14
Cyclohexane	6.0 J
Tetrachloroethene	14
n-Heptane	11
m,p-Xylene	19 J
1,3-Dichlorobenzene	7.1 J
Ethanol	160
Acetone	320
Benzene	5.0 J
1,1,1-Trichloroethane	39
Methylene Chloride	6
Carbon disulfide	8.7 J
Trichlorofluoromethane	4.8 J
Freon TF	65
Methyl Ethyl Ketone	18
Trichloroethene	20
2-Chlorotoluene	6.4 J
1,2,4-Trimethylbenzene	4.6 J

Analyte	SV-9
Ethylbenzene	27
1,3-Butadiene	110
Toluene	21
n-Hexane	88
Cyclohexane	10
Tetrachloroethene	16
n-Heptane	39
cis-1,2-Dichloroethene	13
m,p-Xylene	73
2,2,4-Trimethylpentane	7.0 J
1,3-Dichlorobenzene	5.5 J
Ethanol	140
Acetone	220
Chloroform	18
Benzene	42
Carbon disulfide	9.3 J
Methyl Ethyl Ketone	35
Trichloroethene	77
2-Chlorotoluene	19
1,2,4-Trimethylbenzene	4.3 J

Analyte	SV-7
Ethylbenzene	230
1,3-Butadiene	15
Toluene	14
Chlorobenzene	3.7 J
n-Hexane	25
Cyclohexane	5.9 J
Tetrachloroethene	20
n-Heptane	14
cis-1,2-Dichloroethene	110
m,p-Xylene	130
2,2,4-Trimethylpentane	8.3 J
1,3-Dichlorobenzene	5.3 J B
Ethanol	160
Acetone	520
Benzene	9.9
1,1,1-Trichloroethane	6.8 J
Methylene Chloride	12 J
Carbon disulfide	5.8 J
1,1-Dichloroethane	3.7 J
1,1-Dichloroethene	9
Trichlorofluoromethane	6.3 J
Dichlorodifluoromethane	24 J
Freon TF	43
Methyl Ethyl Ketone	26
Trichloroethene	260
2-Chlorotoluene	29
1,2,4-Trimethylbenzene	5.0 J

Analyte	SV-4
1,3-Butadiene	66
Toluene	32
n-Hexane	23
Acetone	5300 E
Methyl Ethyl Ketone	100

Analyte	SV-2
1,3-Butadiene	110
Toluene	37
n-Hexane	38
Acetone	5700 E
Benzene	20
Methyl Ethyl Ketone	100
Trichloroethene	31

Analyte	SV-3
1,3-Butadiene	98
Toluene	73
n-Hexane	97
n-Heptane	39
Acetone	4700 E
Benzene	120
Methyl Ethyl Ketone	130

Analyte	SV-15
Ethylbenzene	16
1,3-Butadiene	1.8 J
Toluene	130
n-Hexane	21
Tetrachloroethene	8.1 J
n-Heptane	10
m,p-Xylene	53
2,2,4-Trimethylpentane	7.8 J
1,3-Dichlorobenzene	6.6 J B
Ethanol	130
Acetone	720
Benzene	4.2 J
Methylene Chloride	7.6 J
Carbon disulfide	38
Methyl Ethyl Ketone	95
Trichloroethene	9.2 J
2-Chlorotoluene	16
1,2,4-Trimethylbenzene	4.3 J

Analyte	SV-1
1,3-Butadiene	250
Toluene	47
n-Hexane	310
Cyclohexane	23
n-Heptane	97
m,p-Xylene	31
2,2,4-Trimethylpentane	14
Acetone	430
Benzene	71
Methyl Ethyl Ketone	170
Xylene, o-	12
1,2,4-Trimethylbenzene	18

Analyte	SV-14
Ethylbenzene	4.2 J
1,3-Butadiene	5.7
Toluene	140
n-Hexane	38
Tetrachloroethene	4.7 J
n-Heptane	9.3
m,p-Xylene	11 J
2,2,4-Trimethylpentane	10
Ethanol	250
Acetone	1200 D
Benzene	5.2 J
Carbon disulfide	52
tert-Butyl alcohol	62 J
Methyl Ethyl Ketone	110
2-Chlorotoluene	4.0 J
1,2,4-Trimethylbenzene	4.7 J

Analyte	SV-13
Ethylbenzene	14
1,3-Butadiene	120
Toluene	63
n-Hexane	160
Cyclohexane	6.7 J
Tetrachloroethene	6.9 J
n-Heptane	34
m,p-Xylene	34
2,2,4-Trimethylpentane	10
1,3-Dichlorobenzene	5.6 J
Ethanol	160
Acetone	650
Benzene	13
Carbon disulfide	60
Methyl Ethyl Ketone	100
Trichloroethene	13
2-Chlorotoluene	9.5

Analyte	SV-12
Ethylbenzene	6.9 J
1,3-Butadiene	89
Toluene	41
n-Hexane	60
Cyclohexane	6.2 J
Tetrachloroethene	16
n-Heptane	28
m,p-Xylene	17 J
Ethanol	120
Acetone	290
Benzene	19
Carbon disulfide	54
Methyl Ethyl Ketone	39
Trichloroethene	2.7 J
2-Chlorotoluene	6.5 J
1,2,4-Trimethylbenzene	5.4 J

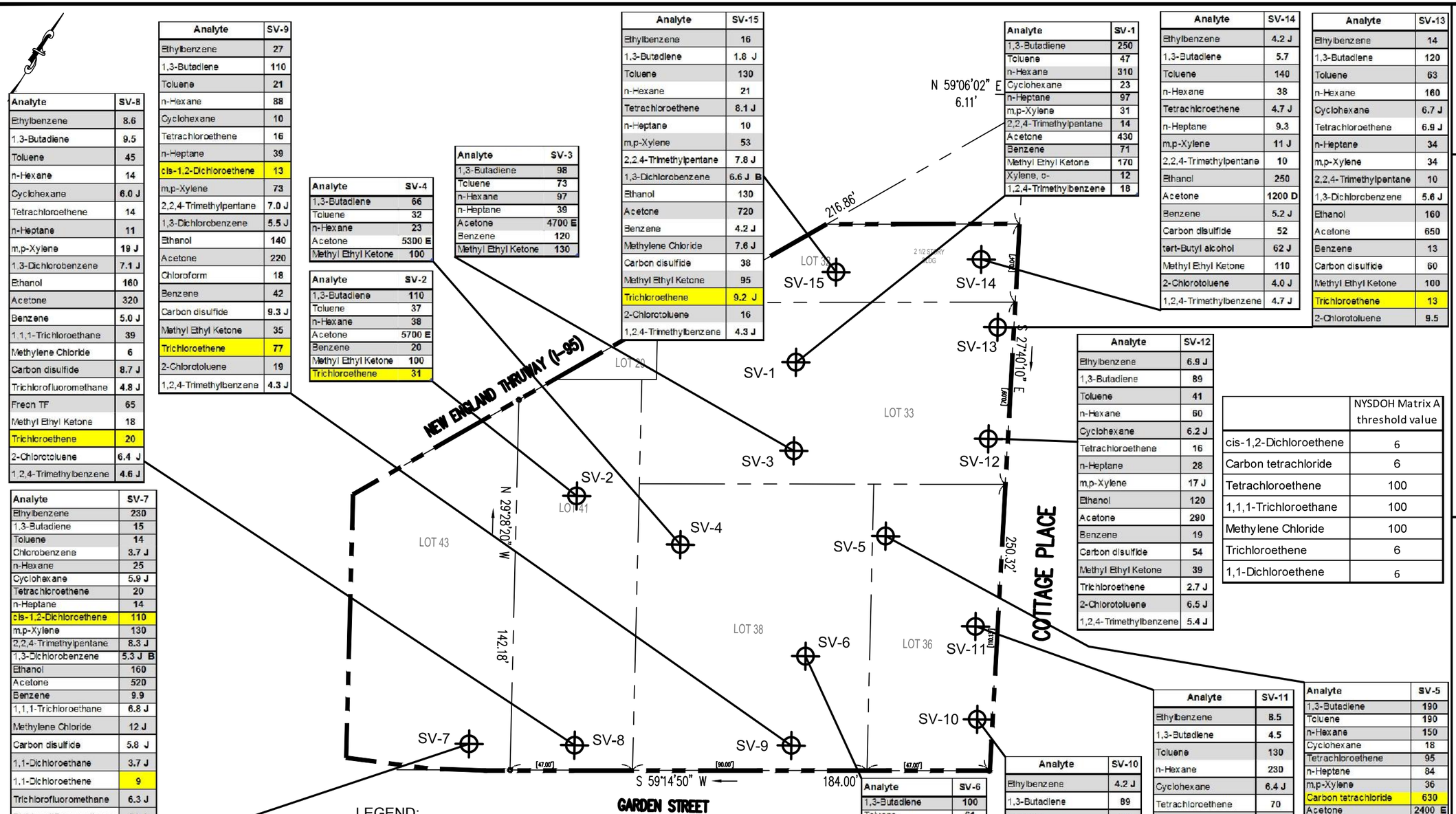
Analyte	SV-6
1,3-Butadiene	100
Toluene	61
n-Hexane	67
n-Heptane	21
Carbon tetrachloride	41
Acetone	4400 E
Benzene	58
Methyl Ethyl Ketone	140
Trichloroethene	810

Analyte	SV-10
Ethylbenzene	4.2 J
1,3-Butadiene	89
Toluene	39
n-Hexane	55
Cyclohexane	4.7 J
Tetrachloroethene	8.8 J
n-Heptane	16
m,p-Xylene	8.9 J
2,2,4-Trimethylpentane	4.2 J
Ethanol	99
Acetone	230
Benzene	12
Carbon disulfide	11 J
Methyl Ethyl Ketone	26
2-Chlorotoluene	3.7 J

Analyte	SV-11
Ethylbenzene	8.5
1,3-Butadiene	4.5
Toluene	130
n-Hexane	230
Cyclohexane	6.4 J
Tetrachloroethene	70
n-Heptane	22
Methyl tert-butyl ether	150
m,p-Xylene	21 J
2,2,4-Trimethylpentane	13
1,3-Dichlorobenzene	9.5 J B
Ethanol	230
Acetone	2000 D
Benzene	8.3
Carbon disulfide	240
tert-Butyl alcohol	87 J
Methyl Ethyl Ketone	210
Trichloroethene	4.4 J
2-Chlorotoluene	6.2 J

Analyte	SV-5
1,3-Butadiene	190
Toluene	190
n-Hexane	150
Cyclohexane	18
Tetrachloroethene	95
n-Heptane	84
m,p-Xylene	36
Carbon tetrachloride	630
Acetone	2400 E
Chloroform	19
Benzene	140
Carbon disulfide	53
Methyl Ethyl Ketone	130
Trichloroethene	13
Xylene, o-	10
1,2,4-Trimethylbenzene	15

	NYSDOH Matrix A threshold value
cis-1,2-Dichloroethene	6
Carbon tetrachloride	6
Tetrachloroethene	100
1,1,1-Trichloroethane	100
Methylene Chloride	100
Trichloroethene	6
1,1-Dichloroethene	6



LEGEND:

- PROPERTY BOUNDARY
- SV-7 - SOIL VAPOR POINT
- BCP SITE BOUNDARY
- Carbon tetrachloride 41 - EXCEEDS NYSDOH MATRIX A THRESHOLD VALUE

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.
REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

SCALE: 1"=40'
0 40 80

dwg by: yy
chk by: JS
scale: 1" = 40
date: 10/07/19

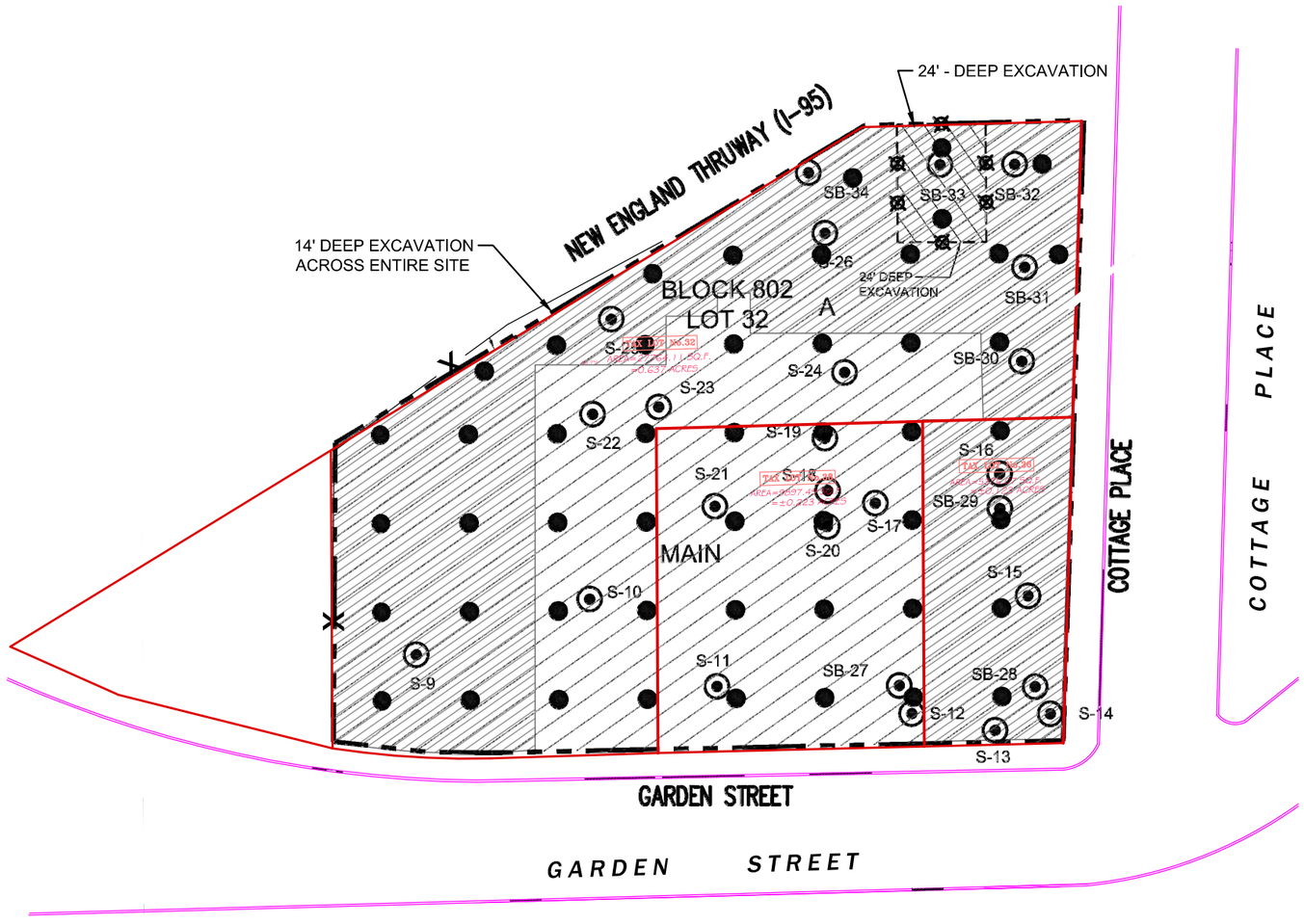
SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE, PINE BROOK, N.J. 07058 PH: 973-808-9050

project:
GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title:
SOIL GAS SAMPLING POINTS AND RESULTS

job no: 10491
drawing no:

FIG-2.5



POST EXCAVATION CONFIRMATIONS SAMPLES			
AREA ID	AREAS	BOTTOM SAMPLES	SIDEWALL SAMPLES
A	1,200 S.F.	2	6
MAIN	41,950 S.F.	47	N/A

POST EXCAVATION SAMPLING:

1. ONE BOTTOM SAMPLE PER 900 SQUARE FEET.
2. ONE SIDEWALL SAMPLE PER 30 LINEAR FEET OF SIDEWALL. A MINIMUM OF ONE SAMPLE PER SIDEWALL.

LEGEND:

- S-15 - SOIL BORING NUMBER & APPROX. LOCATION
- - ADDITIONAL EXCAVATION DEPTH REQUIRED AS NOTED ON PLAN
- - SIDE WALL SAMPLE LOCATION
- - PROP. BOTTOM SAMPLE LOCATION
- - BCP SITE BOUNDARY
- - EXPOSED SOIL- FORMER BUILDING FOOTPRINT
- - ASPHALT PAVED AREAS
- - TAX LOT & BLOCK BORDER

SCALE: 1"=50'

0 50 100

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION IS TAKEN FROM BOUNDARY SURVEY BY OTHERS.

dwg by: AAS
chk by: JS
scale: 1" = 50
date: 11/12/19

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

project:
RAMP
GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title:
SELECTED REMEDY PLAN

job no: 10491
drawing no:
FIG-5.1

APPENDIX A

Previous Environmental Reports

PHASE I ENVIRONMENTAL RISK REVIEW

26, 34 GARDEN STREET
&
10, 16 COTTAGE PLACE
NEW ROCHELLE, NEW YORK

prepared for

1955 Central Avenue
Yonkers, New York

prepared by

DRE Environmental, Inc.
PO Box 273
Millwood, NY 10546

(914) 588-5169

October 2016

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26, 34 GARDEN STREET & 10, 16 COTTAGE PLACE
NEW ROCHELLE, NEW YORK

PHASE I - ENVIRONMENTAL SITE ASSESSMENT

26, 34 Garden Street & 10, 16 COTTAGE PLACE
New Rochelle, New York

This report documents the findings of the Phase I Environmental Site Assessment performed at the property and building known as and located at 26, 34 Garden Street & 10, 16 COTTAGE PLACE, New Rochelle, County of Westchester, NY. Parcels 3-802-0030, 0032, 0033, 0036, 0038

The purpose of the report is to document "recognized environmental conditions" regarding the property and adjacent sites as defined by the American Society of Testing and Materials (ASTM) Site Assessment Standard. The work was performed following the protocols and review limitations recommended by the ASTM Standard Practices for Environmental Site Assessments, E1527-13. The report summarizes the information gathered and observations made during the investigation.

The field work was performed by Donald R. Elmendorf and by other qualified staff of DRE ENVIRONMENTAL, inc. The field and background investigation were conducted during October 2016.

The background information gathering tasks included review of published information from the US EPA, New York State Department of Environmental Conservation, Westchester County Department of Health, and the City of New Rochelle. The agencies were queried regarding practically reviewable historical records and files regarding water, sewer, waste storage and other environmental concerns at the subject site or adjacent properties. The historical record search goal is to investigate past uses over the historical period of time beginning when the property was not yet developed, or 1940 to present. DRE ENVIRONMENTAL, inc. reviewed available reports; area USGS topographic maps, highway and site maps, and available aerial photographs. DRE ENVIRONMENTAL, inc. also reviewed the practically available public information files for the above information regarding adjoining properties.

The field investigation involved the visual inspection of the property, buildings, and surrounding properties to identify "recognized environmental conditions" and any potential facility maintenance or operational practices at this property which might have in the past compromised environmental quality at the subject or adjoining sites, or possibly pose a future "recognized environmental condition". The investigation also

focused on the identification of current potential sources of environmental contamination or conditions, and any potential adjoining property facility maintenance or operational practices on which might present a current potential liability or possibly cause a future environmental condition.

The report is organized into two sections. SECTION I relates only to the subject property. SECTION II relates to properties adjoining to the subject property. The report summarizes the investigative format used to survey the environmental conditions regarding this property and adjoining properties.

SECTION I - SUBJECT PROPERTY

A. PRESENT LAND USE AND BUSINESS PRACTICES

The subject property comprises four commercial buildings and one residential building. The combined parcels comprise approximately three quarters acres of land. The residential parcel on Cottage Place is a two and one half story apartment building with approximately 1,000 sq. ft. of occupied space. The residence was constructed as a residential single family home in the early 1900's, with conversion to multiple apartments over the years, based on information from available records.

The 16 Cottage Place is a single story masonry structure with approximately 1,200 sq. ft. of floor area used for a Kitchen and Bath dealer and other similar warehousing purposes.

The property at 10 – 12 Cottage place is a retail tire and auto repair facility present on the site for over 60 years. The property was once a gasoline station with tanks currently closed on place and prior uses unknown.

28 Garden Street and 34 Garden Street are commercial properties with retail uses documented over the years.

Figure 1 schematically depicts the site, and the property location. The properties in this report are discussed collectively, unless specific information is noted for a particular site.

B. PAST LAND USE AND BUSINESS PRACTICES

Prior use is documented to the early 1900's. The area has been both residential along Cottage Place and retail along Garden Street throughout its history of use.

C. PHYSICAL SITE CHARACTERISTICS

1. Topography

The topography on the site is sloped downward to the north and east, with the area to the southwest at a much higher elevation. The property is nearly 100 percent covered with impermeable surface materials consisting of the building and concrete walks.

2. Surficial Geology and Soils

The area geology typically consists of shallow gravel soils overlying granite bedrock. Based on the soils maps and discussions with the City of New Rochelle, the subsurface conditions of the region do not exhibit unusual geologic conditions to the subject property or to adjoining site properties.

3. Surface Waters

The property is fully developed land with no surface water on site.

D. PHYSICAL STRUCTURE CONDITIONS

The following paragraphs detail the findings of the review for physical " recognized environmental conditions" identified at the time of the site reconnaissance.

1. Asbestos

Based on the age of the building and visible observation, friable asbestos containing materials, as defined by the US EPA, was observed in the structure. Specifically flooring tiles throughout the structure and likely the associated mastics. However, based on the age of the buildings asbestos there is a likelihood that other asbestos will be encountered in the buildings. At this time no action is required, if the buildings are demolished or heavily modified an asbestos survey should be conducted by a licensed asbestos investigator.

2. Fuels & Chemicals on Site

Electricity and natural gas are the fuels now used at the site to heat the building and water. The sites had heating oil but have been converted to natural gas over the years.

3. Underground Storage Tanks

The corner property on Garden and Cottage currently the tire store is a former gasoline station. There are two in ground abandoned 3000 gallon gasoline tanks closed in place in prior to 2000, and a former 1,000 gallon heating oil tank which was removed in 2001. There is no documentation on the closure of the two gasoline tanks were tank. The heating oil tank was cleaned, removed, and observed by the City of New Rochelle Fire Department. IRA CONKLIN in 2001 collected soil samples on four sides of the abandoned gasoline tanks and found no indication of petroleum products in the soil. The heating tank removal included collection of samples, and found no petroleum products in the soils. As there are no records on who closed the gasoline tanks, the tanks' condition, and when they were abandoned, caution should be taken in respect to whether or not the site has been impacted by those tanks in the past. Further, soil borings did not extend to bedrock such there is no comprehensive site assessment conducted on those tanks on record. The other properties have no record of heating oil or gasoline tanks on site.

There are no open spill cases on the property at this time.

4. Drinking Water & Wastewater

The subject parcels are connected to the public water supply system. The property uses the public sewage treatment system for the sanitary waste disposal.

5. Federal, State or Local List of Hazardous Waste Sites

The subject site is not a listed local, state or federal hazardous waste site. See Appendix C for a listing databases reviewed. Based on the information available from the City of New Rochelle Building Department and the NYS DEC and Westchester County Health Department, the subject facility is not currently subject to environmental enforcement or litigation action.

6. Radon

Regionally, radon may be considered a moderate concern.

7. Environmental Permits

The facility requires no permits at this time. However a review of the City of New Rochelle records indicate that there are over 14 known open building department

permits on these properties overall. 20 Cottage street has 6, 10 Cottage has 4, 34 Garden has 4.

8. Waste Generation

The facility generates residential and retail commercial type of wastes.

9. Lead Based Paint

The buildings were constructed during a period that Lead based paint was used as a paint for residential buildings. No action is recommended at this time.

10. Physical Signs of Contamination on or Around the Property

Within the property bounds as defined by adjoining properties, there are no significant visible "recognized environmental conditions" on the property as defined by the ASTM standard. However, we have a condition that must be noted. Although soil borings in the vicinity of the two abandoned gasoline tanks showed no evidence of petroleum compounds to the sides of these abandoned tanks, the soils beneath the tanks were not tested for petroleum compounds and no records are known to exist on the tanks' closure or condition at the time of closure. As such there is a potential for residual petroleum to have impacted the soils beneath the tanks. This is not an actionable condition per the NYS DEC at this time, but if the site is renovated and the tanks are removed the potential for encountering petroleum impacted soils exists based on our experience with similar tanks at other properties over our years of experience.

E. ENVIRONMENTAL RISKS SUMMARY

Within the property bounds as defined by adjoining properties, there are no significant visible "recognized environmental conditions" on the property as defined by the ASTM standard. However, we have a condition that must be noted. Although soil borings in the vicinity of the two abandoned gasoline tanks showed no evidence of petroleum compounds to the sides of these abandoned tanks, the soils beneath the tanks were not tested for petroleum compounds and no records are known to exist on the tanks' closure or condition at the time of closure. As such there is a potential for residual petroleum to have impacted the soils beneath the tanks. This is not an actionable condition per the NYS DEC at this time, but if the site is renovated and the tanks are removed the potential for encountering petroleum impacted soils exists based on our experience with similar tanks at other properties over our years of experience.

SECTION II - ADJACENT PROPERTIES

A. PRESENT LAND USE AND BUSINESS PRACTICES

The adjacent area is primarily highways with a mix of commercial and residential properties. All properties are downgradient of the subject parcels. Refer to the aerial photo for neighborhood characteristic.

B. PAST LAND USE AND BUSINESS PRACTICES

Land use has stayed the same general type for the nearly the past 100 years based on historical maps.

C. PHYSICAL SITE CHARACTERISTICS

1. Topography

The topography in the areas adjacent to the property comprises gently rolling hills, all properties are downgradient of the subject properties.

D. PHYSICAL SITE CONDITIONS OF ADJACENT PROPERTIES

The following paragraphs detail the findings of the review for physical environmental concerns or hazards in the area.

1. Asbestos

Friable asbestos containing materials, as defined by the US EPA, is likely to be incorporated into some building materials installed before 1978 on nearby structures. Such asbestos containing material at adjoining sites will have no foreseeable impact on the subject site.

2. Fuels

Natural gas, electric, and heating oil are the fuels typically used in the residential and commercial area.

3. Chemicals

There are no nearby and adjoining sites which are cross or up gradient that in our opinion are likely to handle chemicals that would pose a "recognized environmental conditions" as defined by the ASTM.

4. Underground Storage Tanks and Spills

There are no known registered underground storage tanks on the nearby up gradient or adjoining sites. Knowledge of tanks under 1,100 gallons or unregistered tanks is beyond the scope of this survey.

5. Transformers

No large transformers were noted on the adjoining properties.

6. Wastewater Discharges

The area is serviced by the public sewer system.

7. Waste Generation

The wastes are typically stored in closed dumpsters until removed by the City or a commercial hauler. There are no enforcement or other actions against the operation.

8. Groundwater Monitoring or Drinking Water Wells

According to the City of New Rochelle Building Department, the buildings in the area are serviced by the public water supply.

9. Federal, State or Local List of Hazardous Waste Sites

There are no properties within the ASTM search area and geologically connected listed on local, state or federal hazardous waste site databases.

10. Environmental Litigation or Regulatory Enforcement Action

Based on the information available from the City of New Rochelle and the historical record search, there are no known nearby properties within 1/2 mile and cross or up gradient of the subject site which are the subject of environmental enforcement.

11. Wetland or Sensitive Ecological Area

There are no adjacent sites which are designated wetlands.

12. Physical Signs of Contamination On or Around the Adjoining Property

There are no adjoining properties which exhibit a visible potential to pose an environmental risk to the subject property at the time of the site reconnaissance.

13. Potential Environmental Risks

Based on a visual review of the business type and property uses, it is our opinion that no adjoining properties exhibit a visible potential to pose a "recognized environmental condition" to the subject property at the time of the site reconnaissance.

E. ENVIRONMENTAL RISKS SUMMARY

Based on a visual review of the business type and property uses, it is our opinion that no adjoining properties exhibit a visible potential to pose a "recognized environmental condition" to the subject property at the time of the site reconnaissance.

SUMMARY

Within the property bounds as defined by adjoining properties, there are no significant visible "recognized environmental conditions" on the property as defined by the ASTM standard. However, we have a condition that must be noted. Although soil borings in the vicinity of the two abandoned gasoline tanks showed no evidence of petroleum compounds to the sides of these abandoned tanks, the soils beneath the tanks were not tested for petroleum compounds and no records are known to exist on the tanks' closure or condition at the time of closure. As such there is a potential for residual petroleum to have impacted the soils beneath the tanks. This is not an actionable condition per the NYS DEC at this time, but if the site is renovated and the tanks are removed the potential for encountering petroleum impacted soils exists based on our experience with similar tanks at other properties over our years of experience.

Based on a visual review of the business type and property uses, it is our opinion that no adjoining properties exhibit a visible potential to pose a "recognized environmental condition" to the subject property at the time of the site reconnaissance.

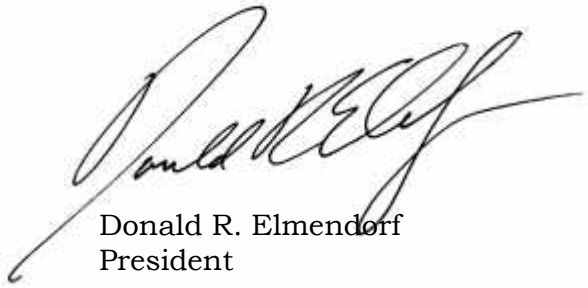
LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This report represents our professional opinion of the "recognized environmental conditions" at the subject site and adjoining properties following the protocols and

review limitations defined by the ASTM Standard Practices for Environmental Site Assessments, E1527-13.

In preparing this report, DRE Environmental, Inc. has accepted as true the information gathered by site personnel and that provided by governmental agency officials. DRE Environmental, Inc. warrants that the services performed were conducted in a competent and professional manner in accordance with standard consulting practices and procedures. DRE Environmental, Inc. cannot warrant the actual site conditions described in this report beyond matters amenable to visual confirmation. There are no third party rights or benefits conferred under this report. Use of this report is strictly limited to the client designated on the title page; the only party to whom DRE Environmental, Inc. intends to confer any rights. Any reliance on the contents of this report by any third party is the sole responsibility of that party.

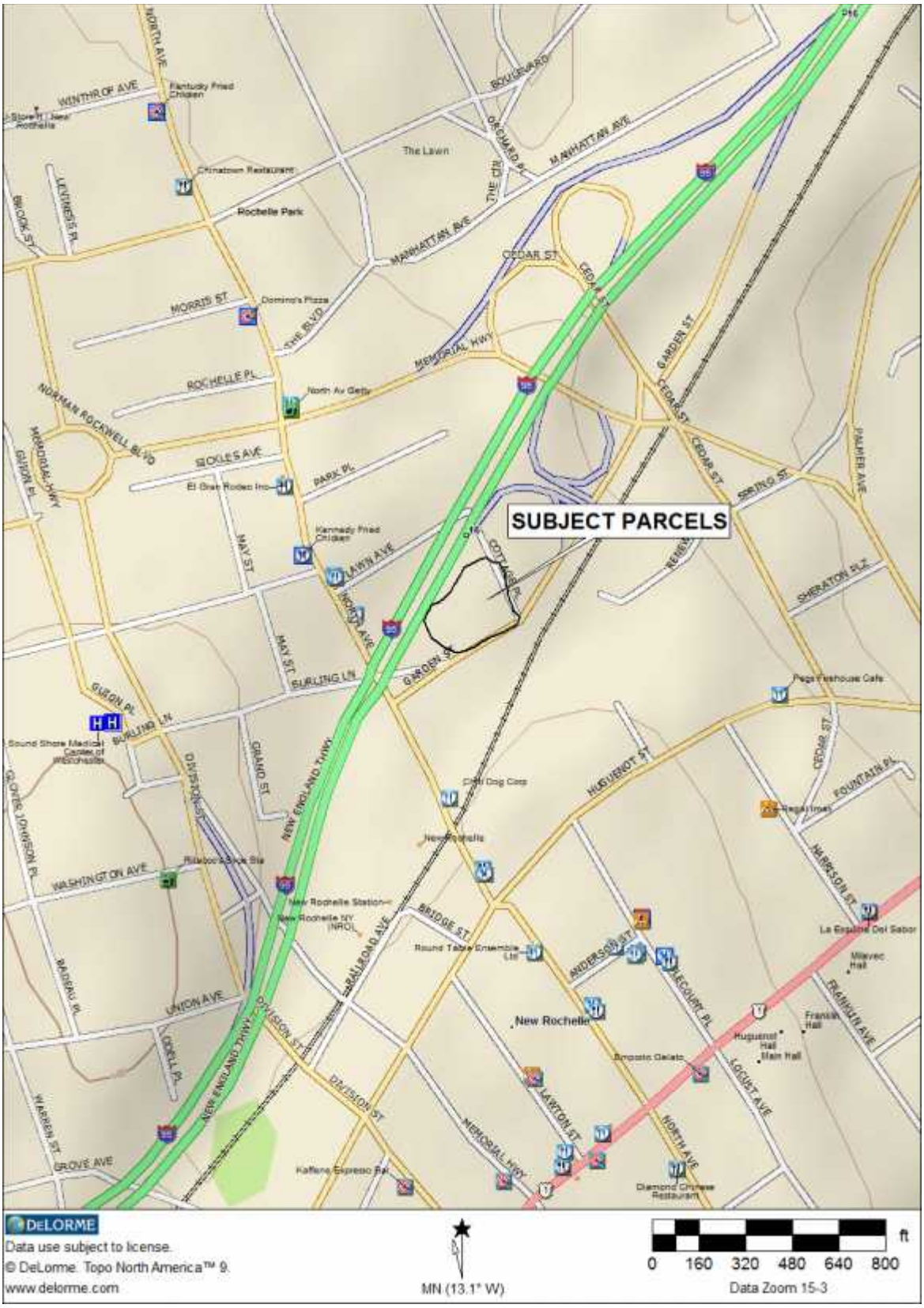
DRE ENVIRONMENTAL, Inc.



Donald R. Elmendorf
President

APPENDIX A

SITE AND LOCATION PLANS



26, 34 Garden Street & 10, 16 COTTAGE PLACE
New Rochelle, New York

26, 34 Garden Street & 10, 16 COTTAGE PLACE
New Rochelle, New York

APPENDIX B

PHOTOGRAPHS

26 Garden Street

34 GARDEN STREE

34 Garden & 10 Cottage

16 COTTAGE

APPENDIX C

HAZARDOUS SITE DATABASES

DATABASE REFERENCE GUIDE

NPL NATIONAL PRIORITIES LIST

The NPL Report, also known as the Superfund List, is an EPA listing of uncontrolled or abandoned hazardous waste sites. The list is primarily based upon a score which the site receives from the EPA's Hazardous Ranking System. These sites are targeted for possible long-term remedial action under the Superfund Act of 1980. US Environmental Protection Agency

CERCLIS COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY INFORMATION SYSTEM

The CERCLIS Database is a comprehensive listing of known or suspected uncontrolled or abandoned hazardous waste sites. These sites have either been investigated, or are currently under investigation by the U.S. EPA for the release, or threatened release of hazardous substances. A site is placed in CERCLIS may be subjected to several levels of review and evaluation, and ultimately placed on the National Priorities List (NPL). CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) are removed from the CERCLIS Database. US Environmental Protection Agency

RCRIS_TS RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM - TREATMENT, STORAGE, AND DISPOSAL FACILITIES

The RCRIS_TS Report contains information pertaining to facilities which either treat, store, or dispose of EPA regulated hazardous waste. The following information is also included in the RCRIS_TS Report: - Information pertaining to the status of facilities tracked by the RCRA Administrative Action Tracking System (RAATS), Inspections & evaluations conducted by federal and state agencies, reported facility violations, the environmental statute(s) violated, and any proposed & actual penalties, Information pertaining to corrective actions undertaken by the facility or EPA., and a complete listing of EPA regulated hazardous wastes which are generated or stored on-site US Environmental Protection Agency

RCRIS_LG RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM - LARGE QUANTITY GENERATORS

The RCRIS_LG Report contains information pertaining to facilities which either generate more than 1000kg of EPA regulated hazardous waste per month, or meet other applicable requirements of the Resource Conservation And Recovery Act. US Environmental Protection Agency

RCRIS_SG RESOURCE CONSERVATION AND RECOVERY INFORMATION SYSTEM - SMALL QUANTITY GENERATORS

The RCRIS_SG Report contains information pertaining to facilities which either generate between 100kg and 1000kg of EPA regulated hazardous waste per month, or meet other applicable requirements of the Resource Conservation And Recovery Act. US Environmental Protection Agency

ERNS EMERGENCY RESPONSE NOTIFICATION SYSTEM

ERNS is a national computer database system that is used to store information concerning the sudden and/or accidental release of hazardous substances, including petroleum, into the environment. The ERNS Reporting System contains preliminary information on specific releases, including the spill location, the substance released, and the responsible party. US Environmental Protection Agency

LRST NEW YORK LEAKING STORAGE TANKS

The New York Leaking Storage Tank Report is a comprehensive listing of all leaking storage tank cases reported to The New York State Department of Environmental Conservation Spill Prevention and Response Section which have not yet been resolved. The information for the LST Report is extracted from the original spills list provided by the NYSDEC. Information pertaining to leaking storage tank cases which have been resolved can be provided upon request.

SWF NEW YORK ACTIVE SOLID WASTE FACILITY REGISTER

The New York Solid Waste Facility Register is a comprehensive listing of all active and inactive permitted solid waste landfills and processing facilities within the State of New York. NY Dept. of Environmental Conservation

HWS NEW YORK INACTIVE HAZARDOUS WASTE DISPOSAL SITES

The New York Inactive Hazardous Waste Disposal Sites List contains summary information pertaining to those facilities that are deemed potentially hazardous to the public health and welfare by the New York State Department of Environmental Conservation (NYSDEC).

NFRAP NO FURTHER REMEDIAL ACTION PLANNED SITES

The No Further Remedial Action Planned Report (NFRAP), also known as the CERCLIS Archive, contains information pertaining to sites which have been removed from the U.S. EPA's CERCLIS Database. NFRAP sites may be sites where, following an initial investigation, either no contamination was found, contamination was removed quickly without need for the site to be placed on the NPL, or the contamination was not serious enough to require federal Superfund action or NPL consideration. US Environmental Protection Agency

FINDS FACILITY INDEX SYSTEM

The FINDS Report is a computerized inventory of all facilities that are regulated or tracked by the U.S. Environmental Protection Agency. These facilities are assigned a unique identification number which serves as a cross-reference for other databases in the EPA's Program System. Each FINDS record indicates the EPA Program Office which is responsible for the tracking of the facility. US Environmental Protection Agency

TRI TOXIC RELEASE INVENTORY SYSTEM

The TRI Report contains information concerning the industrial release and/or transfer of toxic chemicals as reportable under Title III of the Superfund Amendments And Reauthorization Act Of 1986 (SARA Title III). US Environmental Protection Agency

CBS NEW YORK CHEMICAL BULK STORAGE TANKS

The New York Chemical Bulk Storage Report contains information pertaining to active and inactive facilities that store regulated substances in aboveground storage tanks with capacities of 185 gallons or greater, and/or underground storage tanks of any size. NY Dept. of Environmental Conservation

MOSF NEW YORK MAJOR OIL STORAGE FACILITIES

The Major Oil Storage Facilities Report contains summary information on active and inactive facilities with petroleum storage capacities in excess of four-hundred thousand gallons. NY Dept. of Environmental Conservation

PBS NEW YORK PETROLEUM BULK STORAGE TANKS

The New York DEC Petroleum Bulk Storage Report is a comprehensive listing of all reported active and inactive facilities that have petroleum storage capacities in excess of 1100 gallons, and less than four hundred thousand gallons. The PBS information from the Delegated Counties in the State of New York; Cortland, Nassau, Rockland, Suffolk

SPILLS NEW YORK SPILLS REPORT

The New York Spills Report is a comprehensive listing of all hazardous materials spills reported to The New York State Department of Environmental Conservation which have not yet been resolved. Information pertaining to spills which have been resolved can be provided upon request.

TELEPHONE CONTACT NUMBERS

US Environmental Protection Agency	
Office of Solid Waste and Emergency Response	703/603-8881
	202/260-4610
Office of Information Resources Management	800/908-2493
Office of Pollution Prevention and Toxics	202/260-1531
New York State Dept. of Environmental Conservation	
Spill Prevention and Response Section	518/457-7363
Bureau of Solid Waste	518/457-2051
Hazardous Waste Remediation Division	518/457-0740

Appendix D

PROFESSIONAL RESUME

ENVIRONMENTALPROFESSIONAL STATEMENT

We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history and setting of the subject property. We have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. Qualifications of the Environmental Professional are presented in this Appendix.

DONALD R. ELMENDORF, PE

Mr. Elmendorf is a licensed Professional Engineer with over 30 years of diverse experience in the fields of Environmental Engineering and Environmental Sciences. He is president of DRE Environmental, Inc. a consulting firm that provides specialized engineering and environmental consulting services, which began operations in 1988. The firm list of repeat clients which includes Banks, Insurance Companies, Real Estate Companies, Fortune 500 Corporations, Attorneys, and a wide variety of private businesses.

Mr. Elmendorf's professional experience has encompassed **all** areas of Professional Environmental Engineering, Environmental Sciences, and Workplace Health & Safety and Industrial Hygiene. He has extensive experience in the areas of; Environmental Regulations and Compliance Programs, Indoor Air Quality, CERCLA/RCRA projects, hazardous waste management, Environmental Impact Statement Preparation, Indoor Air Quality programs, Industrial Hygiene and OSHA compliance programs, Environmental Risk Management, Environmental Risk Investigations including Phase I and II Site Audits, Soil and Groundwater Contamination and Remediation, Hazardous Materials Contamination and Remediation, and Oil Spill Clean-up and Response, Life Safety and Fire Hazard Assessments and Risk Management, Forensic Engineering and many other related engineering services.

He is thoroughly familiar with the various EPA, OSHA, Federal, State and Local environmental codes, standards and regulations which govern this industry. He has certifications from the US EPA, OSHA and various State agencies regarding Asbestos Management, Hazardous Waste Investigation and Hazardous Waste Spill Response, OSHA Confined Space Entry, and Underground Storage Tank System Design and Investigations. Mr. Elmendorf is also been certified by several court jurisdictions as qualified and competent in the area of national, state and local Environmental, and Fire and Building Codes and building construction related issues.

Mr. Elmendorf is a graduate of Syracuse University with a BS in Environmental & Mechanical Engineering. He was also educated in Forestry and Environmental Sciences at the SUNY College of Environmental Sciences and Forestry. He is a registered Professional Engineer in New York, Connecticut and New Jersey. Mr. Elmendorf is currently an active member of The National Society of Professional Engineers, the American Society of Testing & Materials; and the ASTM E-50 Environmental Standards Committee. He has been a guest speaker at many seminars speaking on various environmental related subject matter. He has been a guest on several television shows regarding environmental topics, and has been published in technical journals and newspapers on various environmental topics.

EDUCATION

* B.S. Environmental and Mechanical Engineering, Syracuse University.
* SUNY College of Forestry, Syracuse University.
** REGISTERED PROFESSIONAL ENGINEER - NEW YORK, NEW JERSEY
** NEW JERSEY - UNDERGROUND STORAGE TANK PROGRAM - Certified Installation, Closure, Tank Testing, & Subsurface Investigations
* OSHA 40 Hazardous Materials Worker / Supervisor Certifications
* OSHA Confined Space Certification

Appendix E

Tank Abandonment Certificate

Phase II Environmental Site Assessment Report

FOR

Cottage Place and Garden Street
New Rochelle, Westchester County, New York

Prepared For:

The Mark 95 LLC & The Mark 95 II LLC
1955 Central Park Avenue
Yonkers, New York 10710

Prepared By:

SESI CONSULTING ENGINEERS, DPC
12A Maple Avenue
Pine Brook, NJ 07058

DATE:

July 26, 2018

_____

Fuad Dahan, P.E.

NY Lic. No. 090531

Table of Contents

Appendices

Figures

1.0 INTRODUCTION

SESI Consulting Engineers, DPC (SESI) has conducted this Phase II Environmental Site Assessment (Phase II ESA) on behalf of the Requestors, The Mark 95 LLC and The Mark 95 II LLC. The Site is located at Cottage Place and Garden Street in the City of New Rochelle, New York (Site). The Site includes Parcels 3-802-0020, 0032, 0033, 0036, 0038, 0041, 0043. The properties total approximately 0.98-acres and have been historically been utilized for residential and commercial purposes.

The adjacent area primarily consists of highways with a mix of commercial and residential properties. Figure 1.1 presents a Site Plan.

This Phase II ESA report summarizes the data of soil samples, soil vapor samples and indoor air samples collected by SESI to investigate the identified Recognized Environmental Concerns (RECs) at the Site as identified in the DRE Environmental, Inc (DRE) Phase I ESA Report, October 2016.

1.1 Recognized Environmental Concerns

The following Recognized Environmental Concerns (RECs) were identified during the Phase I ESA Report prepared by DRE:

- **REC 1: Former gas station with two (2) 3,000-gallon Underground Storage Tanks USTs remaining in place** – The corner property on Garden and Cottage, currently a tire store, was a former gasoline station. There are two underground abandoned 3,000-gallon gasoline tanks which were closed in place in prior to 2000, and a former 1,000-gallon heating oil tank which was removed in 2001. There is no documentation on the closure of the two gasoline tanks.[1] The heating oil tank was cleaned, removed, and observed by the City of New Rochelle Fire Department. The report then states that a person named IRA CONKLIN collected soil samples in 2001 on four sides of the abandoned gasoline tanks and found no indication of petroleum products in the soil. The heating oil tank removal apparently included collection of samples,

[1] While the text of this report indicated that there was no closure documentation, it appears the consultant failed to review the documentation attached in Appendix E to the Phase I report, which is a City of New Rochelle document from the Fire Department does show the 2-3,000 tanks were closed in place and filled with sand.

and no petroleum compounds were detected in the soils. Although soil borings were conducted around the two abandoned gasoline tanks, DRE claimed they showed no evidence of petroleum compounds on the sides of these abandoned tanks, the soil beneath the tanks was not tested for petroleum compounds and no records are known to exist on the closure or condition at the time of closure. As such there is a potential for residual petroleum to have impacted the soils beneath the tanks[2]. The above REC is presented on Figure 1.2.

In addition to this REC identified in the Phase I report, SESI has identified additional RECs:

- **REC-2: Additional Manufacturing Activities on the Site**. While DRE suggested that the Site's only historic use that could have resulted in contamination was the former gas station, a photo in the report reveals a small Plastic Works manufacturing facility at the 26 Garden Street parcel. A company called Strip-A-Way of New Rochelle, Inc. was also on 26 Garden Street for 20 years from 1980-2000. TCE vapor was found in the vicinity of this portion of the Site. Therefore, it is suspected that this facility may be the source of the TCE vapor contamination or as a result of the stripping operations that may have occurred in relation to Strip-A-Way of New Rochelle, Inc.

- **REC-3: Historic Fill**: There are higher than normal levels of metals in the soils. The source is unclear other than they may be the result of historic fill.

1.2 Site Settings

The Site comprises four commercial buildings and one residential building. The combined parcels comprise approximately three quarters acres of land. The residential parcel on Cottage Place is a two and one-half story apartment building with approximately 1,000 sq. ft. of occupied space. The residence was constructed as a residential single-family home in the early 1900's, with conversion to multiple apartments over the years, based on information from available records. The 16 Cottage Place is a single-story masonry structure with approximately 1,200 sq. ft. of floor area used for a Kitchen and Bath dealer and other similar warehousing purposes. The property at 10 – 12 Cottage Place is a retail tire and auto repair facility present on the site for over 60 years. The property was once a gasoline station with underground tanks currently in place and

[2] The data discussed in the Phase I report was not attached to the report. Mr. Donald Elmendorf, PE from DRE has been contacted and he stated that no samples were collected by DRE during the Phase I and the mention of samples collected is probably a mistake.

prior uses are unknown. 28 Garden Street and 34 Garden Street are commercial properties with retail uses documented over the years. 26 Garden Street is a commercial property which was occupied with Plastic Works manufacturing and by Strip-A-Way of New Rochelle Inc..

1.3 Proposed Site Development

The proposed Site development includes a mixed-use project including commercial space and affordable housing residential units.

2.0 SUBSURFACE INVESTIGATION

The field work was conducted by SESI on January 24 and January 26, 2018.

2.1 Soil Borings

SESI subcontracted a Geoprobe® drill rig and spent two days in the field collecting eight (8) soil samples. The soil samples were collected from locations biased towards the findings of the Phase I ESA and at least one sample on each Lot. The soil sample collection depths were based on field screening, which included visual/olfactory observations and screening with a Photo Ionization Detector (PID). We collected soil samples to cover every Lot included in the property as listed below:

Lots 20, 32, 33, 38, 41, and 43: SESI advanced 1 boring within each lot and collected one soil sample from each boring.

Lot 36: As this is the reported location of a previous gas station with two (2) 3,000-gallon Underground Storage Tanks USTs remaining in place, SESI advanced 2 borings and collected 2 soil samples.

The soil samples were sent on a chain of custody to an ELAP-certified laboratory for TCL/TAL +30, TPH and cyanide analysis with a contingent analysis for hexavalent chromium on standard 2-week turnaround time (TAT). Table 2.1 contains a summary of the soil borings and collected samples.

2.2 Soil Vapor and Indoor Air Sampling

On January 24 and 26, 2018, SESI collected seven (7) soil gas samples in summa canisters from the existing building sub-slabs or through the asphalt parking lots. One sample was collected from each Lot that is included within the Site. In addition, we collected four (4) indoor air samples from the Site. One indoor air sample was collected from each lot that contains an enclosed structure (Lots 32, 33, 38, and 41). The soil gas and indoor air samples were sent to an ELAP-Certified laboratory for TO-15 analysis on a standard 2-week TAT.

3.0 ANALYTICAL RESULTS

3.1 Soil Investigation Results

In total, eight (8) soil samples were collected by SESI and analyzed from 8 borings as listed in Table 2.1 and shown in Figure 3.1. The soil samples were distributed and analyzed on each lot to determine the subsurface condition of the entire Site. The soil samples were sent to Test America on a chain-of-custody (COC) for the following analyses: All eight (8) samples for Target Compound List (TCL) and Target Analyte List (TAL) plus 30 tentatively identified compounds (TICs), Total Petroleum Hydrocarbons (TPH), cyanide and a contingent analysis for hexavalent chromium dependent upon the total chromium concentrations. The laboratory files are included in Appendix A. A soil sample location and a summary of the results is shown on Figure 3.1. The soil samples were collected at depths ranging from 1.5 to 11.5 ft bgs. A summary table of the analytical results is included in Table 3.2 and the laboratory reports for the soil samples are included electronically in Appendix A. Table 3.1 contains a summary of the soil exceedances compared with the restricted residential Soil Cleanup Objectives (SCOs).

As shown in Table 3.1, a number of samples exceeded the restricted residential use SCOs.

Table 3.1: Summary of soil exceedances

Sample	Property Where Sample Was Collected	Result (mg/kg)	Unrestricted Use Soil Cleanup Objective (mg/kg)	Restricted Residential Use Soil Cleanup Objective (mg/kg)
S-1(2-2.5')	3-802-0036	Benzo(a)anthracene: 3.9 Benzo(a)pyrene: 3.6 Benzo(b)fluoranthene: 5.2 Benzo(k)fluoranthene: 1.9 Chrysene: 4.1 Dibenz(a,h)anthracene: 0.52 Indeno(1,2,3-cd)pyrene: 1.9 PCBs: 1.2 Cadmium: 18.2 Calcium: 12,000 Copper: 137 Iron: 21,900 Lead: 779 Nickel: 335 Silver: 3.0 Zinc: 762 Mercury: 2.1	1 1 1 0.8 1 0.33 0.5 0.1 2.5 NS 50 NS 63 30 2 109 0.18	1 1 1 1 1 0.33 0.5 1 4.3 NS 270 NS 400 310 180 10,000 0.81
S-2(7.5-8')	3-802-0036	Aluminum: 11,500 Iron: 18,500	NS NS	NS NS
S-3(4.5-5')	3-802-0038	Aluminum: 11,000 Iron: 18,100	NS NS	NS NS
S-4(11-11.5')	3-802-0033	Iron: 13,000	NS	NS
S-5(1.5-2')	3-802-0032	Iron: 15,100	NS	NS
S-6(6-6.5')	3-802-0043	Aluminum: 11,100 Iron: 18,000	NS NS	NS NS
S-7(1.5-2')	3-802-0020	Aluminum: 12,900 Calcium: 27,000 Iron: 15,100 Lead: 172 Mercury: 0.26	NS NS NS 63 0.18	NS NS NS 400 0.81
S-8(4-4.5')	3-802-0041	Calcium: 21,800 Iron: 14,000	NS NS	NS NS

NS = No NYSDEC Standard Established

[Note: For Calcium and Aluminum, there is a CP-51 standard of 10,000 ppm for each under the Protection of Ecological Resources category. For Iron, there is a "Residential" SCO of 2,000 ppm. It is not clear from CP-51 if this is an unrestricted Track 1 or Track 2 Residential SCO.]

Soil sample S-1(2-2.5') was collected adjacent to the two 3,000-gallon underground storage tanks on the former gasoline station property. Polyaromatic Hydrocarbons (PAH), polychlorinated biphenyls (PCBs), and metals were detected in sample S-1(2-2.5') above restricted residential Use SCOs. In addition, iron and other metals were far higher than naturally occurring levels. Iron exceeded the "Residential" CP-51 standard of 2,000 ppm throughout the remainder of the Site.

3.2 Soil Vapor Investigation Results

Seven (7) soil vapor samples (4 sub slab and 3 sub pavement) were collected from the Site. All vapor samples were collected from within the first 1-foot interval below grade (basement slab or

pavement). The samples were sent to ELAP-Certified laboratory (TestAmerica) on a chain of custody (COC) for TO-15 analysis. A soil vapor sample location map and a summary of their results are shown in Figure 3.2. A summary table of the analytical results and the laboratory reports for the soil vapor samples are included electronically in Appendix A. Table 3.3 contains a summary of the soil vapor exceedances of the New York State Department of Health (NYSDOH) Air Guideline Values and/or USEPA Targeted Sub Slab Technical Guidance concentrations. A summary table of the analytical results is included in Table 3.4 and the laboratory reports for the soil samples are included electronically in Appendix A.

As shown in Table 3.3, two sub-slab samples exceeded the soil gas Guideline Values. Sample SS-1, collected from the sub-slab of the building located on Lot 38, exhibited exceedances of the soil gas guidance values for trichloroethene (TCE) and tetrachloroethene (PCE). TCE was detected at 200 $\mu g/m^3$, compared to the updated NYSDOH Air Guidance Value of 2 $\mu g/m^3$. PCE was detected at 3,000 $\mu g/m^3$, compared to the updated NYSDOH Air Guidance Value of 30 $\mu g/m^3$. Sample SS-4, collected from the sub slab of the building located on Lot 33, exhibited exceedances of the soil gas guidance values for chloroform, carbon tetrachloride, 1,1,2-trichloroethane, PCE and TCE. Chloroform was detected at a concentration of 4.3 $\mu g/m^3$, which exceeds the USEPA Technical Guidance Value of 4.1 $\mu g/m^3$. Carbon tetrachloride was detected at a concentration of 17 $\mu g/m^3$ above its NYSDOH Air Guidance Value of 5 $\mu g/m^3$ and above its USEPA Technical Guidance Value of 16 ug/m^3. 1,1,2-trichloroethane was detected at a concentration of 6.8 ug/m^3 above its USEPA Technical Guidance Value of 5.8 ug/m^3. PCE was detected at a concentration of 45 above its NYSDOH Air Guidance Value of 30 ug/m^3. TCE was detected at a concentration of 33 ug/m^3 above its updated NYSDOH Air Guidance Value of 2 $\mu g/m^3$.

The results of the soil vapor sample SP-3 collected from beneath the pavement located in Lot 20 showed PCE, 1,1,1-trichloroethane (1,1,1-TCA), 1,1,2-trichlorethane and TCE were detected above the soil gas guidance values. PCE was detected at a concentration of 110 ug/m^3 above the updated NYSDOH guidance value of 30 ug/m^3. 1,1,1-TCA was detected at a concentration of 740 ug/m^3 above the NYSDOH guidance value of 100 ug/m^3. 1,1,2-trichloroethane was detected at a concentration of 130 ug/m^3 above the USEPA Technical Guidance Value of 5.8 ug/m^3. TCE was detected at a concentration of 26 ug/m^3 above the updated NYSDOH guidance value of 2 ug/m^3 and above the USEPA Technical Guidance Value of 16 ug/m^3.

Table 3.3: Summary of soil gas exceedances of the NYSDOH and/or EPA levels

Sample	Property Where Sample Was Collected	Result ($\mu g/m^3$)	Air Guideline Value by the NYSDOH * ($\mu g/m^3$)	USEPA Targeted Sub Slab and Exterior Soil Gas Concentration ($\mu g/m^3$)
SS-1	3-802-0038	Tetrachloroethene: 200 Trichloroethene: 3000	30 2	360 16
SS-4	3-802-0041	Chloroform: 4.3 Carbon Tetrachloride: 17 1,1,2-Trichloroethane: 6.8 Trichloroethene: 33 Tetrachloroethene: 45	NS 5 NS 2 30	4.1 16 5.8 16 360
SP-3	3-802-0020	Tetrachloroethene: 110 1,1,1-Trichloroethane: 740 1,1,2-Trichloroethane: 130 Trichloroethene: 26	30 100 NS 2	360 170,000 5.8 16

* Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006).
NS = No NYSDEC Standard Established

3.4 Indoor Air Results

Four (4) indoor air samples were collected from the Site. One sample was collected from within the breathing zone in each building. The samples were sent to an ELAP-Certified laboratory (TestAmerica) on a chain of custody (COC) for TO-15 analysis. An indoor air sample location and a summary of their results are shown in Figure 3.2. Table 3.5 presents a summary of the exceedances of the NYSDOH Guideline Values or the EPA Target Indoor Air Concentrations. A summary table of the analytical results is included in table 3.6 and the laboratory reports for the soil vapor samples are included electronically in Appendix A.

Benzene was detected in all four indoor air samples at concentrations ranging from 0.8 to 2.1 ug/m^3 above the USEPA Target Indoor Air Concentration of 0.36 ug/m^3. Chloroform was detected in indoor air sample IA-2 at a concentration of 1.5 ug/m^3 above the USEPA Target Indoor Air Concentration of 0.12 ug/m^3.

Table 3.5: Summary of indoor air exceedances of the NYSDOH and/or EPA levels

Sample	Property Where Sample Was Collected	Result ($\mu g/m^3$)	Air Guideline Value by the NYSDOH * ($\mu g/m^3$)	USEPA Targeted Indoor Air Concentration ($\mu g/m^3$)
IA-1	3-802-0038	Benzene: 2.1	NS NS	0.36
IA-2	3-802-0033	Benzene: 0.80 Chloroform: 1.5	NS NS	0.36 0.12
IA-3	3-802-0032	Benzene: 1.1	NS	0.36
IA-4	3-802-0041	Benzene: 0.99	NS	0.36

* Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006).
NS = No NYSDEC Standard Established

4.0 CONCLUSIONS AND RECOMMENDATIONS

The Site historic uses and the investigation results indicate evidence of PAHs, metals and PCBs above the restricted residential use SCOs in the Site soils on the north side of the two gasoline USTs at soil sample location S-1. Lead, and PAHs are typically associated with gasoline or petroleum hydrocarbon discharges. Additional investigation and eventually remediation of the identified exceedances should be completed before the development on the Site. There are also high levels of iron and other metals throughout the remainder of the Site above CP-51 SCOs for Residential use. CP-51 does not clarify if the "Residential" category described in the chart is a Track 1 SCO or a Track 2 Residential SCO. Therefore, for purposes of this Phase II, it is treated as an exceedance of an applicable residential SCO.

There are chlorinated volatile organic compounds (CVOCs) exceedances in soil vapor from two sub-slab samples located in buildings on Lots 38 and 20 and a sub-pavement sample collected from Lot 20. In addition to the gas station, there was auto repair, Plastic Works and a Strip-A-Way company, all of which likely could have caused the CVOC exceedances in vapor. Additional investigation into the potential source of the chlorinated compounds on-site should be completed before development of the Site. The chlorinated hydrocarbon exceedances of the NYSDOH Guidance values and the USEPA Technical Guidance present a vapor intrusion risk potential.

Benzene was detected in all four indoor air samples at concentrations exceeding the USEPA Target Guidance Concentrations. Benzene is typically associated with gasoline discharges. Although benzene was not detected in soil samples collected adjacent to the two gasoline USTs, it is still possible that the source of benzene in the indoor air samples are these two tanks. Additional investigation is recommended to assess the source of the benzene detected in indoor air at the site.

A Step-out remedial investigation is required to complete the delineation of the reported exceedances. Based on the additional investigation, a remedial action should be performed to remediate the impacted areas prior to any development.

TABLES

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
VOA-8260C-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8260C														
1,1,1-Trichloroethane	0.68	100	0.00021	U	0.00021	0.00022	U	0.00022	0.00019	U	0.00019	0.00023	U	0.00023
1,1,2,2-Tetrachloroethane	NA	NA	0.00019	U	0.00019	0.00020	U	0.00020	0.00017	U	0.00017	0.00021	U	0.00021
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	NA	0.00027	U	0.00027	0.00028	U	0.00028	0.00025	U	0.00025	0.00030	U	0.00030
1,1,2-Trichloroethane	NA	NA	0.00016	U	0.00016	0.00016	U	0.00016	0.00015	U	0.00015	0.00018	U	0.00018
1,1-Dichloroethane	0.27	26	0.00019	U	0.00019	0.00019	U	0.00019	0.00017	U	0.00017	0.00020	U	0.00020
1,1-Dichloroethene	0.33	100	0.00020	U	0.00020	0.00021	U	0.00021	0.00018	U	0.00018	0.00022	U	0.00022
1,2,3-Trichlorobenzene	NA	NA	0.00016	U	0.00016	0.00017	U	0.00017	0.00015	U	0.00015	0.00018	U	0.00018
1,2,4-Trichlorobenzene	NA	NA	0.000083	U	0.000083	0.000085	U	0.000085	0.000075	U	0.000075	0.000091	U	0.000091
1,2-Dibromo-3-Chloropropane	NA	NA	0.00042	U	0.00042	0.00043	U	0.00043	0.00038	U	0.00038	0.00046	U	0.00046
1,2-Dichlorobenzene	1.1	100	0.00013	U	0.00013	0.00013	U	0.00013	0.00012	U	0.00012	0.00014	U	0.00014
1,2-Dichloroethane	0.02	3.1	0.00027	U	0.00027	0.00027	U	0.00027	0.00024	U	0.00024	0.00029	U	0.00029
1,2-Dichloropropane	NA	NA	0.00038	U	0.00038	0.00039	U	0.00039	0.00035	U	0.00035	0.00042	U	0.00042
1,3-Dichlorobenzene	2.4	49	0.00014	U	0.00014	0.00015	U	0.00015	0.00013	U	0.00013	0.00016	U	0.00016
1,4-Dichlorobenzene	1.8	13	0.000090	U	0.000090	0.000093	U	0.000093	0.000082	U	0.000082	0.000099	U	0.000099
1,4-Dioxane	0.1	13	0.0083	U	0.0083	0.0085	U	0.0085	0.0075	U	0.0075	0.0091	U	0.0091
2-Butanone (MEK)	0.12	NA	0.0010	U	0.0010	0.0010	U	0.0010	0.00091	U	0.00091	0.0011	U	0.0011
2-Hexanone	NA	NA	0.00070	U	0.00070	0.00072	U	0.00072	0.00064	U	0.00064	0.00077	U	0.00077
4-Methyl-2-pentanone (MIBK)	NA	NA	0.00060	U	0.00060	0.00061	U	0.00061	0.00054	U	0.00054	0.00066	U	0.00066
Acetone	0.05	100	0.0034	U	0.0034	0.0035	U	0.0035	0.0076		0.0031	0.0038	U	0.0038
Benzene	0.06	4.8	0.00023	U	0.00023	0.00024	U	0.00024	0.00021	U	0.00021	0.00026	U	0.00026
Bromoform	NA	NA	0.00038	U	0.00038	0.00039	U	0.00039	0.00035	U	0.00035	0.00042	U	0.00042
Bromomethane	NA	NA	0.00043	U	0.00043	0.00044	U	0.00044	0.00039	U	0.00039	0.00047	U	0.00047
Carbon disulfide	NA	NA	0.00024	U	0.00024	0.00025	U	0.00025	0.00022	U	0.00022	0.00026	U	0.00026
Carbon tetrachloride	0.76	2.4	0.00016	U	0.00016	0.00017	U	0.00017	0.00015	U	0.00015	0.00018	U	0.00018
Chlorobenzene	1.1	100	0.00016	U	0.00016	0.00016	U	0.00016	0.00014	U	0.00014	0.00018	U	0.00018
Chlorobromomethane	NA	NA	0.00025	U	0.00025	0.00026	U	0.00026	0.00023	U	0.00023	0.00028	U	0.00028
Chlorodibromomethane	NA	NA	0.00018	U	0.00018	0.00018	U	0.00018	0.00016	U	0.00016	0.00019	U	0.00019
Chloroethane	NA	NA	0.00047	U	0.00047	0.00048	U	0.00048	0.00043	U	0.00043	0.00052	U	0.00052
Chloroform	0.37	49	0.00029	U	0.00029	0.00030	U	0.00030	0.00026	U	0.00026	0.00032	U	0.00032
Chloromethane	NA	NA	0.00039	U	0.00039	0.00040	U	0.00040	0.00036	U	0.00036	0.00043	U	0.00043
cis-1,2-Dichloroethene	0.25	100	0.00014	U	0.00014	0.00014	U	0.00014	0.00012	U	0.00012	0.00015	U	0.00015
cis-1,3-Dichloropropene	NA	NA	0.00025	U	0.00025	0.00025	U	0.00025	0.00022	U	0.00022	0.00027	U	0.00027
Cyclohexane	NA	NA	0.00020	U	0.00020	0.00020	U	0.00020	0.00018	U	0.00018	0.00022	U	0.00022

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
VOA-8260C-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8260C														
Dichlorobromomethane	NA	NA	0.00023	U	0.00023	0.00024	U	0.00024	0.00021	U	0.00021	0.00026	U	0.00026
Dichlorodifluoromethane	NA	NA	0.00031	U	0.00031	0.00031	U	0.00031	0.00028	U	0.00028	0.00034	U	0.00034
Ethylbenzene	1	41	0.00018	U	0.00018	0.00018	U	0.00018	0.00016	U	0.00016	0.00020	U	0.00020
Ethylene Dibromide	NA	NA	0.00016	U	0.00016	0.00017	U	0.00017	0.00015	U	0.00015	0.00018	U	0.00018
Isopropylbenzene	NA	NA	0.00011	U	0.00011	0.00012	U	0.00012	0.00010	U	0.00010	0.00013	U	0.00013
Methyl acetate	NA	NA	0.0039	U	0.0039	0.0040	U	0.0040	0.0035	U	0.0035	0.0043	U	0.0043
Methyl tert-butyl ether	0.93	100	0.00011	U	0.00011	0.00012	U	0.00012	0.00010	U	0.00010	0.00012	U	0.00012
Methylcyclohexane	NA	NA	0.00014	U	0.00014	0.00015	U	0.00015	0.00013	U	0.00013	0.00016	U	0.00016
Methylene Chloride	0.05	100	0.00015	U	0.00015	0.00015	U	0.00015	0.00013	U	0.00013	0.00016	U	0.00016
m-Xylene & p-Xylene	NA	NA	0.00016	U	0.00016	0.00016	U	0.00016	0.00014	U	0.00014	0.00017	U	0.00017
o-Xylene	NA	NA	0.000086	U	0.000086	0.000088	U	0.000088	0.000078	U	0.000078	0.000094	U	0.000094
Styrene	NA	NA	0.00011	U	0.00011	0.00011	U	0.00011	0.00010	U	0.00010	0.00012	U	0.00012
Tetrachloroethene	1.3	19	0.00013	U	0.00013	0.00013	U	0.00013	0.00012	U	0.00012	0.00014	U	0.00014
Toluene	0.7	100	0.00056	U	0.00056	0.00058	U	0.00058	0.00051	U	0.00051	0.00062	U	0.00062
trans-1,2-Dichloroethene	0.19	100	0.00022	U	0.00022	0.00023	U	0.00023	0.00020	U	0.00020	0.00024	U	0.00024
trans-1,3-Dichloropropene	NA	NA	0.00024	U	0.00024	0.00025	U	0.00025	0.00022	U	0.00022	0.00026	U	0.00026
Trichloroethene	0.47	21	0.00013	U	0.00013	0.00013	U	0.00013	0.00027	J	0.00012	0.00014	U	0.00014
Trichlorofluoromethane	NA	NA	0.00037	U	0.00037	0.00038	U	0.00038	0.00033	U	0.00033	0.00040	U	0.00040
Vinyl chloride	0.02	0.9	0.00049	U	0.00049	0.00051	U	0.00051	0.00045	U	0.00045	0.00054	U	0.00054
Total Conc	NA	NA	0.0			0.0			0.00787			0.0		
Total Estimated Conc. (TICs)	NA	NA	0.0*T			0.0*T			0.0*T			0.0*T		

*T There are no TICs reported for the sample

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
VOA-8260C-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8260C														
1,1,1-Trichloroethane	0.68	100	0.00021	U	0.00021	0.00023	U	0.00023	0.00048	J	0.00024	0.00019	U	0.00019
1,1,2,2-Tetrachloroethane	NA	NA	0.00020	U	0.00020	0.00021	U	0.00021	0.00022	U	0.00022	0.00018	U	0.00018
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	NA	0.00028	U	0.00028	0.00029	U	0.00029	0.00031	U	0.00031	0.00025	U	0.00025
1,1,2-Trichloroethane	NA	NA	0.00016	U	0.00016	0.00017	U	0.00017	0.00032	J	0.00018	0.00015	U	0.00015
1,1-Dichloroethane	0.27	26	0.00019	U	0.00019	0.00020	U	0.00020	0.00021	U	0.00021	0.00017	U	0.00017
1,1-Dichloroethene	0.33	100	0.00021	U	0.00021	0.00022	U	0.00022	0.00023	U	0.00023	0.00019	U	0.00019
1,2,3-Trichlorobenzene	NA	NA	0.00017	U	0.00017	0.00018	U	0.00018	0.00018	U	0.00018	0.00015	U	0.00015
1,2,4-Trichlorobenzene	NA	NA	0.000085	U	0.000085	0.000089	U	0.000089	0.000094	U	0.000094	0.000076	U	0.000076
1,2-Dibromo-3-Chloropropane	NA	NA	0.00042	U	0.00042	0.00045	U	0.00045	0.00047	U	0.00047	0.00038	U	0.00038
1,2-Dichlorobenzene	1.1	100	0.00013	U	0.00013	0.00014	U	0.00014	0.00015	U	0.00015	0.00012	U	0.00012
1,2-Dichloroethane	0.02	3.1	0.00027	U	0.00027	0.00029	U	0.00029	0.00030	U	0.00030	0.00025	U	0.00025
1,2-Dichloropropane	NA	NA	0.00039	U	0.00039	0.00041	U	0.00041	0.00043	U	0.00043	0.00035	U	0.00035
1,3-Dichlorobenzene	2.4	49	0.00015	U	0.00015	0.00015	U	0.00015	0.00016	U	0.00016	0.00013	U	0.00013
1,4-Dichlorobenzene	1.8	13	0.000092	U	0.000092	0.000097	U	0.000097	0.00010	U	0.00010	0.000083	U	0.000083
1,4-Dioxane	0.1	13	0.0085	U	0.0085	0.0089	U	0.0089	0.0093	U	0.0093	0.0076	U	0.0076
2-Butanone (MEK)	0.12	NA	0.0010	U	0.0010	0.0011	U	0.0011	0.0011	U	0.0011	0.00092	U	0.00092
2-Hexanone	NA	NA	0.00072	U	0.00072	0.00076	U	0.00076	0.00079	U	0.00079	0.00065	U	0.00065
4-Methyl-2-pentanone (MIBK)	NA	NA	0.00061	U	0.00061	0.00065	U	0.00065	0.00068	U	0.00068	0.00055	U	0.00055
Acetone	0.05	100	0.0035	U	0.0035	0.0037	U	0.0037	0.0039	U	0.0039	0.0031	U	0.0031
Benzene	0.06	4.8	0.00024	U	0.00024	0.00025	U	0.00025	0.00026	U	0.00026	0.00021	U	0.00021
Bromoform	NA	NA	0.00039	U	0.00039	0.00041	U	0.00041	0.00043	U	0.00043	0.00035	U	0.00035
Bromomethane	NA	NA	0.00044	U	0.00044	0.00046	U	0.00046	0.00048	U	0.00048	0.00039	U	0.00039
Carbon disulfide	NA	NA	0.00025	U	0.00025	0.00026	U	0.00026	0.00027	U	0.00027	0.00022	U	0.00022
Carbon tetrachloride	0.76	2.4	0.00017	U	0.00017	0.00018	U	0.00018	0.00018	U	0.00018	0.00015	U	0.00015
Chlorobenzene	1.1	100	0.00016	U	0.00016	0.00017	U	0.00017	0.00018	U	0.00018	0.00015	U	0.00015
Chlorobromomethane	NA	NA	0.00026	U	0.00026	0.00027	U	0.00027	0.00029	U	0.00029	0.00023	U	0.00023
Chlorodibromomethane	NA	NA	0.00018	U	0.00018	0.00019	U	0.00019	0.00020	U	0.00020	0.00016	U	0.00016
Chloroethane	NA	NA	0.00048	U	0.00048	0.00051	U	0.00051	0.00053	U	0.00053	0.00043	U	0.00043
Chloroform	0.37	49	0.00029	U	0.00029	0.00031	U	0.00031	0.00032	U	0.00032	0.00026	U	0.00026
Chloromethane	NA	NA	0.00040	U	0.00040	0.00042	U	0.00042	0.00044	U	0.00044	0.00036	U	0.00036
cis-1,2-Dichloroethene	0.25	100	0.00014	U	0.00014	0.00015	U	0.00015	0.00015	U	0.00015	0.00013	U	0.00013
cis-1,3-Dichloropropene	NA	NA	0.00025	U	0.00025	0.00027	U	0.00027	0.00028	U	0.00028	0.00023	U	0.00023
Cyclohexane	NA	NA	0.00020	U	0.00020	0.00021	U	0.00021	0.00023	U	0.00023	0.00018	U	0.00018

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
VOA-8260C-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8260C														
Dichlorobromomethane	NA	NA	0.00024	U	0.00024	0.00025	U	0.00025	0.00026	U	0.00026	0.00021	U	0.00021
Dichlorodifluoromethane	NA	NA	0.00031	U	0.00031	0.00033	U	0.00033	0.00034	U	0.00034	0.00028	U	0.00028
Ethylbenzene	1	41	0.00018	U	0.00018	0.00019	U	0.00019	0.00020	U	0.00020	0.00016	U	0.00016
Ethylene Dibromide	NA	NA	0.00017	U	0.00017	0.00017	U	0.00017	0.00018	U	0.00018	0.00015	U	0.00015
Isopropylbenzene	NA	NA	0.00012	U	0.00012	0.00012	U	0.00012	0.00013	U	0.00013	0.00010	U	0.00010
Methyl acetate	NA	NA	0.0040	U	0.0040	0.0042	U	0.0042	0.0044	U	0.0044	0.0036	U	0.0036
Methyl tert-butyl ether	0.93	100	0.00012	U	0.00012	0.00012	U	0.00012	0.00013	U	0.00013	0.00010	U	0.00010
Methylcyclohexane	NA	NA	0.00015	U	0.00015	0.00016	U	0.00016	0.00016	U	0.00016	0.00013	U	0.00013
Methylene Chloride	0.05	100	0.00015	U	0.00015	0.00016	U	0.00016	0.00017	U	0.00017	0.0013		0.00014
m-Xylene & p-Xylene	NA	NA	0.00016	U	0.00016	0.00017	U	0.00017	0.00018	U	0.00018	0.00014	U	0.00014
o-Xylene	NA	NA	0.000088	U	0.000088	0.000092	U	0.000092	0.000097	U	0.000097	0.000079	U	0.000079
Styrene	NA	NA	0.00011	U	0.00011	0.00012	U	0.00012	0.00013	U	0.00013	0.00010	U	0.00010
Tetrachloroethene	1.3	19	0.00013	U	0.00013	0.00014	U	0.00014	0.00090	J	0.00015	0.00017	J	0.00012
Toluene	0.7	100	0.00058	U	0.00058	0.00061	U	0.00061	0.00064	U	0.00064	0.00052	U	0.00052
trans-1,2-Dichloroethene	0.19	100	0.00023	U	0.00023	0.00024	U	0.00024	0.00025	U	0.00025	0.00020	U	0.00020
trans-1,3-Dichloropropene	NA	NA	0.00025	U	0.00025	0.00026	U	0.00026	0.00027	U	0.00027	0.00022	U	0.00022
Trichloroethene	0.47	21	0.00013	U	0.00013	0.00014	U	0.00014	0.00017	J	0.00015	0.00030	J	0.00012
Trichlorofluoromethane	NA	NA	0.00037	U	0.00037	0.00039	U	0.00039	0.00041	U	0.00041	0.00034	U	0.00034
Vinyl chloride	0.02	0.9	0.00050	U	0.00050	0.00053	U	0.00053	0.00056	U	0.00056	0.00045	U	0.00045
Total Conc	NA	NA	0.0			0.0			0.00187			0.00177		
Total Estimated Conc. (TICs)	NA	NA	0.0*T			0.0*T			0.0*T			0.005		

*T There are no TICs reported for the sample

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	2			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
SVOA-8270D-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8270D														
1,1'-Biphenyl	NA	NA	0.056	J	0.015	0.0075	U	0.0075	0.0074	U	0.0074	0.0073	U	0.0073
1,2,4,5-Tetrachlorobenzene	NA	NA	0.033	U	0.033	0.016	U	0.016	0.016	U	0.016	0.016	U	0.016
2,2'-oxybis[1-chloropropane]	NA	NA	0.015	U	0.015	0.0076	U	0.0076	0.0074	U	0.0074	0.0074	U	0.0074
2,3,4,6-Tetrachlorophenol	NA	NA	0.030	U	0.030	0.015	U	0.015	0.014	U	0.014	0.014	U	0.014
2,4,5-Trichlorophenol	NA	NA	0.029	U	0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
2,4,6-Trichlorophenol	NA	NA	0.030	U	0.030	0.015	U	0.015	0.014	U	0.014	0.014	U	0.014
2,4-Dichlorophenol	NA	NA	0.024	U	0.024	0.012	U	0.012	0.011	U	0.011	0.011	U	0.011
2,4-Dimethylphenol	NA	NA	0.029	U	0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
2,4-Dinitrophenol	NA	NA	0.081	U	0.081	0.040	U	0.040	0.039	U	0.039	0.039	U	0.039
2,4-Dinitrotoluene	NA	NA	0.029	U	0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
2,6-Dinitrotoluene	NA	NA	0.031	U	0.031	0.015	U	0.015	0.015	U	0.015	0.015	U	0.015
2-Chloronaphthalene	NA	NA	0.027	U	0.027	0.013	U	0.013	0.013	U	0.013	0.013	U	0.013
2-Chlorophenol	NA	NA	0.031	U	0.031	0.015	U	0.015	0.015	U	0.015	0.015	U	0.015
2-Methylnaphthalene	NA	NA	0.20	J	0.018	0.0089	U	0.0089	0.0087	U	0.0087	0.0087	U	0.0087
2-Methylphenol	0.33	100	0.038	U	0.038	0.019	U	0.019	0.018	U	0.018	0.018	U	0.018
2-Nitroaniline	NA	NA	0.018	U	0.018	0.0086	U	0.0086	0.0085	U	0.0085	0.0084	U	0.0084
2-Nitrophenol	NA	NA	0.044	U	0.044	0.021	U	0.021	0.021	U	0.021	0.021	U	0.021
3,3'-Dichlorobenzidine	NA	NA	0.016	U	0.016	0.0079	U	0.0079	0.0078	U	0.0078	0.0078	U	0.0078
3-Nitroaniline	NA	NA	0.020	U	0.020	0.0099	U	0.0099	0.0097	U	0.0097	0.0097	U	0.0097
4,6-Dinitro-2-methylphenol	NA	NA	0.049	U	0.049	0.024	U	0.024	0.023	U	0.023	0.023	U	0.023
4-Bromophenyl phenyl ether	NA	NA	0.023	U	0.023	0.011	U	0.011	0.011	U	0.011	0.011	U	0.011
4-Chloro-3-methylphenol	NA	NA	0.028	U	0.028	0.014	U	0.014	0.013	U	0.013	0.013	U	0.013
4-Chloroaniline	NA	NA	0.053	U	0.053	0.026	U	0.026	0.025	U	0.025	0.025	U	0.025
4-Chlorophenyl phenyl ether	NA	NA	0.021	U	0.021	0.010	U	0.010	0.010	U	0.010	0.010	U	0.010
4-Methylphenol	0.33	100	0.022	U	0.022	0.011	U	0.011	0.011	U	0.011	0.011	U	0.011
4-Nitroaniline	NA	NA	0.11	U	0.11	0.055	U	0.055	0.054	U	0.054	0.054	U	0.054
4-Nitrophenol	NA	NA	0.059	U	0.059	0.029	U	0.029	0.028	U	0.028	0.028	U	0.028
Acenaphthene	20	100	0.74		0.028	0.014	U	0.014	0.013	U	0.013	0.013	U	0.013
Acenaphthylene	100	100	0.074	J	0.020	0.0097	U	0.0097	0.0095	U	0.0095	0.0095	U	0.0095
Acetophenone	NA	NA	0.045	U	0.045	0.022	U	0.022	0.022	U	0.022	0.021	U	0.021
Anthracene	100	100	1.5		0.026	0.013	U	0.013	0.012	U	0.012	0.012	U	0.012
Atrazine	NA	NA	0.038	U	0.038	0.019	U	0.019	0.018	U	0.018	0.018	U	0.018
Benzaldehyde	NA	NA	0.082	U	0.082	0.040	U	0.040	0.039	U	0.039	0.039	U	0.039
Benzo[a]anthracene	1	1	**3.9**		0.019	0.0094	U	0.0094	0.0092	U	0.0092	0.0092	U	0.0092
Benzo[a]pyrene	1	1	**3.6**		0.021	0.010	U	0.010	0.0099	U	0.0099	0.0099	U	0.0099
Benzo[b]fluoranthene	1	1	**5.2**		0.022	0.011	U	0.011	0.011	U	0.011	0.011	U	0.011
Benzo[g,h,i]perylene	100	100	1.4		0.049	0.024	U	0.024	0.024	U	0.024	0.024	U	0.024
Benzo[k]fluoranthene	0.8	3.9	**1.9**		0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
Bis(2-chloroethoxy)methane	NA	NA	0.042	U	0.042	0.021	U	0.021	0.020	U	0.020	0.020	U	0.020
Bis(2-chloroethyl)ether	NA	NA	0.029	U	0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
Bis(2-ethylhexyl) phthalate	NA	NA	0.21	J	0.022	0.011	U	0.011	0.063	J	0.010	0.010	U	0.010
Butyl benzyl phthalate	NA	NA	0.024	U	0.024	0.012	U	0.012	0.012	U	0.012	0.012	U	0.012

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	2			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
SVOA-8270D-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8270D														
Caprolactam	NA	NA	0.029	U	0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
Carbazole	NA	NA	1.0		0.018	0.0089	U	0.0089	0.0087	U	0.0087	0.0087	U	0.0087
Chrysene	1	3.9	**4.1**		0.025	0.012	U	0.012	0.012	U	0.012	0.012	U	0.012
Dibenz(a,h)anthracene	0.33	0.33	**0.52**		0.055	0.027	U	0.027	0.027	U	0.027	0.027	U	0.027
Dibenzofuran	7	59	0.40	J	0.022	0.011	U	0.011	0.011	U	0.011	0.011	U	0.011
Diethyl phthalate	NA	NA	0.025	U	0.025	0.012	U	0.012	0.012	U	0.012	0.012	U	0.012
Dimethyl phthalate	NA	NA	0.024	U	0.024	0.012	U	0.012	0.011	U	0.011	0.011	U	0.011
Di-n-butyl phthalate	NA	NA	**0.11**	J	0.015	0.0075	U	0.0075	0.0073	U	0.0073	0.0073	U	0.0073
Di-n-octyl phthalate	NA	NA	0.021	U	0.021	0.010	U	0.010	0.0099	U	0.0099	0.0099	U	0.0099
Fluoranthene	100	100	8.5		0.015	0.0075	U	0.0075	0.0074	U	0.0074	0.0074	U	0.0074
Fluorene	30	100	0.80		0.018	0.0088	U	0.0088	0.0086	U	0.0086	0.0086	U	0.0086
Hexachlorobenzene	0.33	1.2	0.035	U	0.035	0.017	U	0.017	0.017	U	0.017	0.017	U	0.017
Hexachlorobutadiene	NA	NA	0.019	U	0.019	0.0093	U	0.0093	0.0091	U	0.0091	0.0091	U	0.0091
Hexachlorocyclopentadiene	NA	NA	0.024	U	0.024	0.012	U	0.012	0.011	U	0.011	0.011	U	0.011
Hexachloroethane	NA	NA	0.025	U	0.025	0.012	U	0.012	0.012	U	0.012	0.012	U	0.012
Indeno[1,2,3-cd]pyrene	0.5	0.5	**1.9**		0.029	0.014	U	0.014	0.014	U	0.014	0.014	U	0.014
Isophorone	NA	NA	0.024	U	0.024	0.012	U	0.012	0.011	U	0.011	0.011	U	0.011
Naphthalene	12	100	0.33	J	0.018	0.0091	U	0.0091	0.0089	U	0.0089	0.0089	U	0.0089
Nitrobenzene	NA	15	0.017	U	0.017	0.0084	U	0.0084	0.0082	U	0.0082	0.0082	U	0.0082
N-Nitrosodi-n-propylamine	NA	NA	0.032	U	0.032	0.016	U	0.016	0.015	U	0.015	0.015	U	0.015
N-Nitrosodiphenylamine	NA	NA	0.023	U	0.023	0.011	U	0.011	0.011	U	0.011	0.011	U	0.011
Pentachlorophenol	0.8	6.7	0.19	U	0.19	0.094	U	0.094	0.092	U	0.092	0.092	U	0.092
Phenanthrene	100	100	7.3		0.021	0.010	U	0.010	0.010	U	0.010	0.010	U	0.010
Phenol	0.33	100	0.025	U	0.025	0.012	U	0.012	0.012	U	0.012	0.012	U	0.012
Pyrene	100	100	8.1		0.026	0.013	U	0.013	0.013	U	0.013	0.013	U	0.013
Total Conc	NA	NA	51.84			0.0			0.063			0.0		
Total Estimated Conc. (TICs)	NA	NA	21.02			11.0			6.2			11.6		

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.
X : Surrogate is outside control limits

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
SVOA-8270D-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8270D														
1,1'-Biphenyl	NA	NA	0.0073	U	0.0073	0.0075	U	0.0075	0.0086	U	0.0086	0.0074	U	0.0074
1,2,4,5-Tetrachlorobenzene	NA	NA	0.016	U	0.016	0.016	U	0.016	0.018	U	0.018	0.016	U	0.016
2,2'-oxybis[1-chloropropane]	NA	NA	0.0074	U	0.0074	0.0076	U	0.0076	0.0087	U	0.0087	0.0074	U	0.0074
2,3,4,6-Tetrachlorophenol	NA	NA	0.014	U	0.014	0.015	U	0.015	0.017	U	0.017	0.014	U	0.014
2,4,5-Trichlorophenol	NA	NA	0.014	U	0.014	0.014	U	0.014	0.016	U	0.016	0.014	U	0.014
2,4,6-Trichlorophenol	NA	NA	0.014	U	0.014	0.015	U	0.015	0.017	U	0.017	0.014	U	0.014
2,4-Dichlorophenol	NA	NA	0.011	U	0.011	0.012	U	0.012	0.013	U	0.013	0.011	U	0.011
2,4-Dimethylphenol	NA	NA	0.014	U	0.014	0.014	U	0.014	0.016	U	0.016	0.014	U	0.014
2,4-Dinitrophenol	NA	NA	0.039	U	0.039	0.040	U F1	0.040	0.046	U	0.046	0.039	U	0.039
2,4-Dinitrotoluene	NA	NA	0.014	U	0.014	0.014	U	0.014	0.016	U	0.016	0.014	U	0.014
2,6-Dinitrotoluene	NA	NA	0.015	U	0.015	0.015	U	0.015	0.017	U	0.017	0.015	U	0.015
2-Chloronaphthalene	NA	NA	0.013	U	0.013	0.013	U	0.013	0.015	U	0.015	0.013	U	0.013
2-Chlorophenol	NA	NA	0.015	U	0.015	0.015	U	0.015	0.017	U	0.017	0.015	U	0.015
2-Methylnaphthalene	NA	NA	0.0086	U	0.0086	0.0089	U	0.0089	0.010	U	0.010	0.017	J	0.0087
2-Methylphenol	0.33	100	0.018	U	0.018	0.019	U	0.019	0.022	U	0.022	0.019	U	0.019
2-Nitroaniline	NA	NA	0.0084	U	0.0084	0.0086	U	0.0086	0.0099	U	0.0099	0.0085	U	0.0085
2-Nitrophenol	NA	NA	0.021	U	0.021	0.021	U	0.021	0.025	U	0.025	0.021	U	0.021
3,3'-Dichlorobenzidine	NA	NA	0.0078	U	0.0078	0.0080	U	0.0080	0.0091	U	0.0091	0.0078	U	0.0078
3-Nitroaniline	NA	NA	0.0097	U	0.0097	0.0099	U	0.0099	0.011	U	0.011	0.0097	U	0.0097
4,6-Dinitro-2-methylphenol	NA	NA	0.023	U	0.023	0.024	U F1	0.024	0.027	U	0.027	0.023	U	0.023
4-Bromophenyl phenyl ether	NA	NA	0.011	U	0.011	0.011	U	0.011	0.013	U	0.013	0.011	U	0.011
4-Chloro-3-methylphenol	NA	NA	0.013	U	0.013	0.014	U	0.014	0.016	U	0.016	0.013	U	0.013
4-Chloroaniline	NA	NA	0.025	U	0.025	0.026	U	0.026	0.030	U	0.030	0.025	U	0.025
4-Chlorophenyl phenyl ether	NA	NA	0.010	U	0.010	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010
4-Methylphenol	0.33	100	0.011	U	0.011	0.011	U	0.011	0.012	U	0.012	0.011	U	0.011
4-Nitroaniline	NA	NA	0.053	U	0.053	0.055	U	0.055	0.063	U	0.063	0.054	U	0.054
4-Nitrophenol	NA	NA	0.028	U	0.028	0.029	U	0.029	0.033	U	0.033	0.028	U	0.028
Acenaphthene	20	100	0.013	U	0.013	0.014	U	0.014	0.016	U	0.016	0.016	J	0.013
Acenaphthylene	100	100	0.0095	U	0.0095	0.0097	U	0.0097	0.011	U	0.011	0.0095	U	0.0095
Acetophenone	NA	NA	0.021	U	0.021	0.022	U	0.022	0.025	U	0.025	0.022	U	0.022
Anthracene	100	100	0.012	U	0.012	0.013	U	0.013	0.015	U	0.015	0.027	J	0.012
Atrazine	NA	NA	0.018	U	0.018	0.019	U	0.019	0.022	U	0.022	0.018	U	0.018
Benzaldehyde	NA	NA	0.039	U	0.039	0.040	U	0.040	0.046	U	0.046	0.085	J	0.039
Benzo[a]anthracene	1	1	0.0092	U	0.0092	0.0094	U	0.0094	0.053		0.011	0.068		0.0092
Benzo[a]pyrene	1	1	0.0099	U	0.0099	0.010	U	0.010	0.044		0.012	0.046		0.0099
Benzo[b]fluoranthene	1	1	0.011	U	0.011	0.011	U	0.011	0.064		0.013	0.076		0.011
Benzo[g,h,i]perylene	100	100	0.024	U	0.024	0.024	U	0.024	0.045	J	0.028	0.035	J	0.024
Benzo[k]fluoranthene	0.8	3.9	0.014	U	0.014	0.014	U	0.014	0.024	J	0.017	0.028	J	0.014
Bis(2-chloroethoxy)methane	NA	NA	0.020	U	0.020	0.021	U	0.021	0.024	U	0.024	0.020	U	0.020
Bis(2-chloroethyl)ether	NA	NA	0.014	U	0.014	0.014	U	0.014	0.016	U	0.016	0.014	U	0.014
Bis(2-ethylhexyl) phthalate	NA	NA	0.010	U	0.010	0.011	U	0.011	0.012	U	0.012	0.010	U	0.010
Butyl benzyl phthalate	NA	NA	0.012	U	0.012	0.012	U	0.012	0.014	U	0.014	0.012	U	0.012

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
SVOA-8270D-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8270D														
Caprolactam	NA	NA	0.014	U	0.014	0.014	U	0.014	0.016	U	0.016	0.014	U	0.014
Carbazole	NA	NA	0.0086	U	0.0086	0.0089	U	0.0089	0.010	U	0.010	0.012	J	0.0087
Chrysene	1	3.9	0.012	U	0.012	0.012	U	0.012	0.053	J	0.014	0.070	J	0.012
Dibenz(a,h)anthracene	0.33	0.33	0.026	U	0.026	0.027	U	0.027	0.031	U	0.031	0.027	U	0.027
Dibenzofuran	7	59	0.011	U	0.011	0.011	U	0.011	0.013	U	0.013	0.014	J	0.011
Diethyl phthalate	NA	NA	0.012	U	0.012	0.012	U	0.012	0.014	U	0.014	0.012	U	0.012
Dimethyl phthalate	NA	NA	0.011	U	0.011	0.012	U	0.012	0.013	U	0.013	0.011	U	0.011
Di-n-butyl phthalate	NA	NA	0.0073	U	0.0073	0.0075	U	0.0075	0.0086	U	0.0086	0.0073	U	0.0073
Di-n-octyl phthalate	NA	NA	0.0099	U	0.0099	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010
Fluoranthene	100	100	0.0073	U	0.0073	0.0075	U	0.0075	0.094	J	0.0086	0.16	J	0.0074
Fluorene	30	100	0.0086	U	0.0086	0.0088	U	0.0088	0.010	U	0.010	0.016	J	0.0086
Hexachlorobenzene	0.33	1.2	0.017	U	0.017	0.017	U	0.017	0.019	U	0.019	0.017	U	0.017
Hexachlorobutadiene	NA	NA	0.0091	U	0.0091	0.0093	U	0.0093	0.011	U	0.011	0.0091	U	0.0091
Hexachlorocyclopentadiene	NA	NA	0.011	U	0.011	0.012	U	0.012	0.013	U	0.013	0.011	U	0.011
Hexachloroethane	NA	NA	0.012	U	0.012	0.012	U	0.012	0.014	U	0.014	0.012	U	0.012
Indeno[1,2,3-cd]pyrene	0.5	0.5	0.014	U	0.014	0.014	U	0.014	0.046		0.016	0.037		0.014
Isophorone	NA	NA	0.011	U	0.011	0.012	U	0.012	0.013	U	0.013	0.011	U	0.011
Naphthalene	12	100	0.0088	U	0.0088	0.0091	U	0.0091	0.010	U	0.010	0.017	J	0.0089
Nitrobenzene	NA	15	0.0082	U	0.0082	0.0084	U	0.0084	0.0096	U	0.0096	0.0082	U	0.0082
N-Nitrosodi-n-propylamine	NA	NA	0.015	U	0.015	0.016	U	0.016	0.018	U	0.018	0.015	U	0.015
N-Nitrosodiphenylamine	NA	NA	0.011	U	0.011	0.011	U	0.011	0.013	U	0.013	0.011	U	0.011
Pentachlorophenol	0.8	6.7	0.092	U	0.092	0.094	U	0.094	0.11	U	0.11	0.092	U	0.092
Phenanthrene	100	100	0.010	U	0.010	0.010	U	0.010	0.047	J	0.012	0.15	J	0.010
Phenol	0.33	100	0.012	U	0.012	0.012	U	0.012	0.014	U	0.014	0.012	U	0.012
Pyrene	100	100	0.013	U	0.013	0.013	U	0.013	0.094	J	0.015	0.12	J	0.013
Total Conc	NA	NA	0.0			0.0			0.564			0.994		
Total Estimated Conc. (TICs)	NA	NA	4.0			5.7			1.2			25.06		

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.
X : Surrogate is outside control limits

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
GCSVOA-8081B-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8081B														
4,4'-DDD	0.0033	13	0.0013	U	0.0013	0.0013	U	0.0013	0.0012	U	0.0012	0.0012	U	0.0012
4,4'-DDE	0.0033	8.9	0.00089	U	0.00089	0.00087	U	0.00087	0.00085	U	0.00085	0.00085	U	0.00085
4,4'-DDT	0.0033	7.9	0.0014	U	0.0014	0.0014	U	0.0014	0.0013	U	0.0013	0.0013	U	0.0013
Aldrin	0.005	0.097	0.0011	U	0.0011	0.0011	U	0.0011	0.0011	U	0.0011	0.0011	U	0.0011
alpha-BHC	0.02	0.48	0.00076	U	0.00076	0.00075	U	0.00075	0.00074	U	0.00074	0.00073	U	0.00073
beta-BHC	0.036	0.36	0.00084	U	0.00084	0.00083	U	0.00083	0.00081	U	0.00081	0.00081	U	0.00081
Chlordane (technical)	NA	NA	0.018	U	0.018	0.018	U	0.018	0.018	U	0.018	0.018	U	0.018
delta-BHC	0.04	100	0.00046	U	0.00046	0.00045	U	0.00045	0.00044	U	0.00044	0.00044	U	0.00044
Dieldrin	0.005	0.2	0.00098	U	0.00098	0.00096	U	0.00096	0.00094	U	0.00094	0.00094	U	0.00094
Endosulfan I	2.4	24	0.0011	U	0.0011	0.0011	U	0.0011	0.0011	U	0.0011	0.0011	U	0.0011
Endosulfan II	2.4	24	0.0019	U	0.0019	0.0019	U	0.0019	0.0019	U	0.0019	0.0019	U	0.0019
Endosulfan sulfate	2.4	24	0.00094	U	0.00094	0.00093	U	0.00093	0.00091	U	0.00091	0.00091	U	0.00091
Endrin	0.014	11	0.0011	U	0.0011	0.0011	U	0.0011	0.0010	U	0.0010	0.0010	U	0.0010
Endrin aldehyde	NA	NA	0.0018	U	0.0018	0.0017	U	0.0017	0.0017	U	0.0017	0.0017	U	0.0017
Endrin ketone	NA	NA	0.0015	U	0.0015	0.0014	U	0.0014	0.0014	U	0.0014	0.0014	U	0.0014
gamma-BHC (Lindane)	0.1	1.3	0.00070	U	0.00070	0.00068	U	0.00068	0.00067	U	0.00067	0.00067	U	0.00067
Heptachlor	0.042	2.1	0.00089	U	0.00089	0.00087	U	0.00087	0.00085	U	0.00085	0.00085	U	0.00085
Heptachlor epoxide	NA	NA	0.0011	U	0.0011	0.0011	U	0.0011	0.0011	U	0.0011	0.0011	U	0.0011
Methoxychlor	NA	NA	0.0017	U	0.0017	0.0017	U	0.0017	0.0017	U	0.0017	0.0017	U	0.0017
Toxaphene	NA	NA	0.027	U	0.027	0.027	U	0.027	0.026	U	0.026	0.026	U	0.026

U : Indicates the analyte was analyzed for
but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
GCSVOA-8081B-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8081B														
4,4'-DDD	0.0033	13	0.0012	U	0.0012	0.0013	U	0.0013	0.0014	U	0.0014	0.0012	U	0.0012
4,4'-DDE	0.0033	8.9	0.00085	U	0.00085	0.00087	U	0.00087	0.0010	U	0.0010	0.00086	U	0.00086
4,4'-DDT	0.0033	7.9	0.0013	U	0.0013	0.0014	U	0.0014	0.0016	U	0.0016	0.0013	U	0.0013
Aldrin	0.005	0.097	0.0011	U	0.0011	0.0011	U	0.0011	0.0013	U	0.0013	0.0011	U	0.0011
alpha-BHC	0.02	0.48	0.00073	U	0.00073	0.00075	U	0.00075	0.00086	U	0.00086	0.00074	U	0.00074
beta-BHC	0.036	0.36	0.00081	U	0.00081	0.00083	U	0.00083	0.00095	U	0.00095	0.00081	U	0.00081
Chlordane (technical)	NA	NA	0.017	U	0.017	0.018	U	0.018	0.021	U	0.021	0.018	U	0.018
delta-BHC	0.04	100	0.00044	U	0.00044	0.00045	U	0.00045	0.00052	U	0.00052	0.00044	U	0.00044
Dieldrin	0.005	0.2	0.00094	U	0.00094	0.00096	U	0.00096	0.0011	U	0.0011	0.00094	U	0.00094
Endosulfan I	2.4	24	0.0011	U	0.0011	0.0011	U	0.0011	0.0013	U	0.0013	0.0011	U	0.0011
Endosulfan II	2.4	24	0.0019	U	0.0019	0.0019	U	0.0019	0.0022	U	0.0022	0.0019	U	0.0019
Endosulfan sulfate	2.4	24	0.00090	U	0.00090	0.00093	U	0.00093	0.0011	U	0.0011	0.00091	U	0.00091
Endrin	0.014	11	0.0010	U	0.0010	0.0011	U	0.0011	0.0012	U	0.0012	0.0010	U	0.0010
Endrin aldehyde	NA	NA	0.0017	U	0.0017	0.0017	U	0.0017	0.0020	U	0.0020	0.0017	U	0.0017
Endrin ketone	NA	NA	0.0014	U	0.0014	0.0014	U	0.0014	0.0016	U	0.0016	0.0014	U	0.0014
gamma-BHC (Lindane)	0.1	1.3	0.00067	U	0.00067	0.00069	U	0.00069	0.00079	U	0.00079	0.00067	U	0.00067
Heptachlor	0.042	2.1	0.00085	U	0.00085	0.00087	U	0.00087	0.0010	U	0.0010	0.00086	U	0.00086
Heptachlor epoxide	NA	NA	0.0011	U	0.0011	0.0011	U	0.0011	0.0013	U	0.0013	0.0011	U	0.0011
Methoxychlor	NA	NA	0.0016	U	0.0016	0.0017	U	0.0017	0.0019	U	0.0019	0.0017	U	0.0017
Toxaphene	NA	NA	0.026	U	0.026	0.027	U	0.027	0.031	U	0.031	0.026	U	0.026

U : Indicates the analyte was analyzed for
but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
GCSVOA-8082A-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8082A														
Aroclor 1016	NA	NA	0.010	U	0.010	0.0098	U	0.0098	0.0096	U	0.0096	0.0096	U	0.0096
Aroclor 1221	NA	NA	0.010	U	0.010	0.0098	U	0.0098	0.0096	U	0.0096	0.0096	U	0.0096
Aroclor 1232	NA	NA	0.010	U	0.010	0.0098	U	0.0098	0.0096	U	0.0096	0.0096	U	0.0096
Aroclor 1242	NA	NA	0.010	U	0.010	0.0098	U	0.0098	0.0096	U	0.0096	0.0096	U	0.0096
Aroclor 1248	NA	NA	0.010	U	0.010	0.0098	U	0.0098	0.0096	U	0.0096	0.0096	U	0.0096
Aroclor 1254	NA	NA	0.010	U	0.010	0.010	U	0.010	0.010	U	0.010	0.0099	U	0.0099
Aroclor 1260	NA	NA	1.2		0.010	0.010	U	0.010	0.010	U	0.010	0.0099	U	0.0099
Aroclor 1268	NA	NA	0.010	U	0.010	0.010	U	0.010	0.010	U	0.010	0.0099	U	0.0099
Aroclor-1262	NA	NA	0.010	U	0.010	0.010	U	0.010	0.010	U	0.010	0.0099	U	0.0099
Total PCBs	0.1	1	**1.2**		0.010	0.010	U	0.010	0.010	U	0.010	0.0099	U	0.0099

Highlighted Concentrations shown in bold type face exceed limits
U : Indicates the analyte was analyzed for
but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
Dilution Factor	Criteria	Criteria	1			1			1			1		
Unit	mg/kg	mg/kg	mg/kg			mg/kg			mg/kg			mg/kg		
GCSVOA-8082A-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 8082A														
Aroclor 1016	NA	NA	0.0096	U	0.0096	0.0098	U	0.0098	0.011	U	0.011	0.0096	U	0.0096
Aroclor 1221	NA	NA	0.0096	U	0.0096	0.0098	U	0.0098	0.011	U	0.011	0.0096	U	0.0096
Aroclor 1232	NA	NA	0.0096	U	0.0096	0.0098	U	0.0098	0.011	U	0.011	0.0096	U	0.0096
Aroclor 1242	NA	NA	0.0096	U	0.0096	0.0098	U	0.0098	0.011	U	0.011	0.0096	U	0.0096
Aroclor 1248	NA	NA	0.0096	U	0.0096	0.0098	U	0.0098	0.011	U	0.011	0.0096	U	0.0096
Aroclor 1254	NA	NA	0.0099	U	0.0099	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010
Aroclor 1260	NA	NA	0.0099	U	0.0099	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010
Aroclor 1268	NA	NA	0.0099	U	0.0099	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010
Aroclor-1262	NA	NA	0.0099	U	0.0099	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010
Total PCBs	0.1	1	0.0099	U	0.0099	0.010	U	0.010	0.012	U	0.012	0.010	U	0.010

Highlighted Concentrations shown in bold type face exceed limits
U : Indicates the analyte was analyzed for
but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
	Criteria	Criteria												
Unit														
METALS-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 6010C(MG/KG)														
Aluminum	NA	NA	9760		7.3	**11500**		6.8	**11000**		7.1	7680		6.7
Antimony	NA	NA	3.3	J	0.43	0.40	U	0.40	0.42	U	0.42	0.39	U	0.39
Arsenic	13	16	6.6		0.66	0.91	J	0.61	0.64	U	0.64	0.61	U	0.61
Barium	350	400	242		2.9	85.4		2.7	87.7		2.8	68.3		2.7
Beryllium	7.2	72	0.35	J	0.041	0.22	J	0.038	0.19	J	0.040	0.17	J	0.038
Cadmium	2.5	4.3	**18.2**		0.11	0.099	U	0.099	0.10	U	0.10	0.097	U	0.097
Calcium	NA	NA	**12000**		91.0	781	J	84.7	1950		88.3	1750		83.5
Chromium	NA	NA	175		0.50	22.3		0.46	24.7		0.48	14.4		0.45
Cobalt	NA	NA	7.4	J	1.0	7.6	J	0.95	16.2		0.99	5.7	J	0.93
Copper	50	270	**137**		1.0	17.3		0.94	35.3		0.98	14.8		0.93
Iron	NA	NA	**21900**		4.8	**18500**		4.5	**18100**		4.7	**13000**		4.4
Lead	63	400	**779**		0.54	10		0.50	4.0		0.52	4.0		0.49
Magnesium	NA	NA	5930		68.8	3080		64.0	3580		66.8	2350		63.1
Manganese	1600	2000	434		0.28	464		0.26	454		0.27	281		0.25
Nickel	30	310	**335**		0.68	19.9		0.63	25.7		0.66	15.1		0.62
Potassium	NA	NA	2400		47.5	3090		44.2	3370		46.1	2550		43.6
Selenium	3.9	180	1.1	U	1.1	1.0	U	1.0	1.0	U	1.0	0.99	U	0.99
Silver	2	180	**3.0**		0.27	0.25	U	0.25	0.26	U	0.26	0.25	U	0.25
Sodium	NA	NA	97.5	J	68.7	105	J	64.0	219	J	66.7	165	J	63.0
Thallium	NA	NA	1.1	U	1.1	0.98	U	0.98	1.0	U	1.0	0.97	U	0.97
Vanadium	NA	NA	27.7		1.1	26.9		0.99	30.3		1.0	18.1		0.97
Zinc	109	10000	**762**		0.46	37.8		0.43	37.4		0.45	27.0		0.42
SOIL BY 7471B(MG/KG)														
Mercury	0.18	0.81	**2.1**		0.035	0.012	U	0.012	0.012	U	0.012	0.012	U	0.012

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
	Criteria	Criteria												
Unit														
METALS-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 6010C(MG/KG)														
Aluminum	NA	NA	9550		8.8	**11100**		9.1	**12900**		10.2	7760		8.9
Antimony	NA	NA	0.51	U	0.51	0.53	U	0.53	0.60	U	0.60	0.52	U	0.52
Arsenic	13	16	0.79	U	0.79	1.1	J	0.82	8.3		0.92	0.92	J	0.80
Barium	350	400	61.6		3.5	86.6		3.6	181		4.0	62.3		3.5
Beryllium	7.2	72	0.70		0.049	0.89		0.051	1.0		0.057	0.68		0.050
Cadmium	2.5	4.3	0.13	U	0.13	0.13	U	0.13	0.15	U	0.15	0.13	U	0.13
Calcium	NA	NA	2990		109	1210		113	**27000**		127	**21800**		111
Chromium	NA	NA	17.2		0.59	19.9		0.61	22.2		0.69	30.6		0.60
Cobalt	NA	NA	4.1	J	1.2	6.2	J	1.3	6.0	J	1.4	4.7	J	1.2
Copper	50	270	14.2		1.2	18.0		1.3	25.2		1.4	15.7		1.2
Iron	NA	NA	**15100**		5.8	**18000**		6.0	**15100**		6.7	**14000**		5.9
Lead	63	400	4.1		0.64	34.6		0.67	**172**		0.75	4.7		0.65
Magnesium	NA	NA	3200		82.3	2600		85.3	3130		95.7	3100		83.6
Manganese	1600	2000	482		0.33	561		0.34	605		0.38	217		0.34
Nickel	30	310	13.2		0.81	18.4		0.84	15.8		0.94	14.5		0.82
Potassium	NA	NA	2270		56.8	2810		58.9	1220	J	66.1	2490		57.7
Selenium	3.9	180	1.3	U	1.3	1.3	U	1.3	1.5	U	1.5	1.3	U	1.3
Silver	2	180	0.33	U	0.33	0.34	U	0.34	0.38	U	0.38	0.33	U	0.33
Sodium	NA	NA	82.2	U	82.2	524	J	85.2	330	J	95.6	231	J	83.5
Thallium	NA	NA	1.3	U	1.3	1.3	U	1.3	1.5	U	1.5	1.3	U	1.3
Vanadium	NA	NA	21.1		1.3	26.1		1.3	28.9		1.5	20.3		1.3
Zinc	109	10000	24.1		0.55	46.5		0.57	84.7		0.64	26.9		0.56
SOIL BY 7471B(MG/KG)														
Mercury	0.18	0.81	0.011	U	0.011	0.012	U	0.012	**0.26**		0.013	0.011	U	0.011

Highlighted Concentrations shown in bold type face exceed limits

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-1(2-2.5')**			**S-2(7.5-8')**			**S-3(4.5-5')**			**S-4(11-11.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149090-1			460-149090-2			460-149090-3			460-149090-4		
Sampling Date	Use Soil	Restricted Residential	01/24/2018 09:00:00			01/24/2018 09:30:00			01/24/2018 10:00:00			01/24/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
	Criteria	Criteria												
WETCHEM-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 1664A														
TPH (1664A) (mg/l)	NA	NA	45.0	U	45.0	45.0	U	45.0	44.0	U	44.0	45.5	U	45.5
SOIL BY 9012B														
Cyanide, Total (mg/kg)	27	NA	0.31		0.066	0.070	J F1	0.070	0.10	J	0.063	0.061	U	0.061

F1 : MS and/or MSD Recovery is outside acceptance limits.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 3.2: Soil Sample Results Summary
Garden Street, New Rochelle, NY
SESI Consulting Engineers D.P.C.
January 2018

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SUMMARY OF ANALYTICAL RESULTS: 460-149090-1
Job Description: Garden Street, New Rochelle, NY
For:
SESI Consulting Engineers
12 A Maple Avenue
Pine Brook, New Jersey 07058

Client ID	NY 375-6.8(a)	NY 375-6.8(b)	**S-5(1.5-2')**			**S-6(6-6.5')**			**S-7(1.5-2')**			**S-8(4-4.5')**		
Lab Sample ID	UnRestricted	& CP-51 T-1	460-149215-1			460-149215-2			460-149215-3			460-149215-4		
Sampling Date	Use Soil	Restricted Residential	01/26/2018 14:00:00			01/26/2018 09:30:00			01/26/2018 10:30:00			01/26/2018 12:00:00		
Matrix	Cleanup	Soil Cleanup	Soil			Soil			Soil			Soil		
	Criteria	Criteria												
WETCHEM-SOIL			Result	Q	MDL	Result	Q	MDL	Result	Q	MDL	Result	Q	MDL
SOIL BY 1664A														
TPH (1664A) (mg/l)	NA	NA	45.0	U	45.0	45.5	U	45.5	44.0	U	44.0	45.5	U	45.5
SOIL BY 9012B														
Cyanide, Total (mg/kg)	27	NA	0.061	U	0.061	0.062	U	0.062	0.77		0.074	0.063	U	0.063

F1 : MS and/or MSD Recovery is outside acceptance limits.

J : Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

U : Indicates the analyte was analyzed for but not detected.

Table 3.4: Sub Slab and Indoor Air Results Summary
Cottage Place Garden Street
New Rochelle, New York
SESI Job Number 9822

Compound	CAS#	NYSDEC / NYSDOH Guidance ug/m3	EPA Target Sub Slab Concentration ug/m3	SS-1 E18-00025-01 Q	SS-1 E18-00025-01 ug/m3	SS-1 E18-00025-01 RL ug/m3	SS-2 E18-00025-02 Q	SS-2 E18-00025-02 ug/m3	SS-2 E18-00025-02 RL ug/m3	SS-3 E18-00025-03 Q	SS-3 E18-00025-03 ug/m3	SS-3 E18-00025-03 RL ug/m3	SS-4 E18-00025-04 Q	SS-4 E18-00025-04 ug/m3	SS-4 E18-00025-04 RL ug/m3
Acetone	67-64-1		1100000	D	86	4.8	D	410	48		7.1	0.48		30	0.48
Benzene	71-43-2		12		ND	6.4		8.1	0.64		ND	0.64		9.2	0.64
Bromodichloromethane	75-27-4				ND	13		ND	1.3		ND	1.3		ND	1.3
Bromoform	75-25-2				ND	21		8.2	2.1		ND	2.1		ND	2.1
Bromomethane	74-83-9				ND	7.8		ND	0.78		ND	0.78		ND	0.78
1,3-Butadiene	106-99-0				ND	4.4		ND	0.44		ND	0.44		ND	0.44
Chlorobenzene	108-90-7				ND	9.2		ND	0.92		ND	0.92		ND	0.92
Chloroethane	75-00-3				ND	5.3		ND	0.53		ND	0.53		ND	0.53
Chloroform	67-66-3		4.1		ND	9.8		2.6	0.98		ND	0.98		**4.3**	0.98
Chloromethane	74-87-3				ND	4.1		ND	0.41		ND	0.41		ND	0.41
Carbon disulfide	75-15-0		24000		ND	6.2		15	0.62		ND	0.62		8.1	0.62
Carbon tetrachloride	56-23-5	5 (250)	16		ND	2.5		0.44	0.25		0.50	0.25		**17**	0.25
Cyclohexane	110-82-7		210000		ND	6.9		3.6	0.69		ND	0.69		4.0	0.69
Dibromochloromethane	124-48-1				ND	17		ND	1.7		ND	1.7		ND	1.7
1,2-Dibromoethane	106-93-4				ND	15		ND	1.5		ND	1.5		ND	1.5
1,2-Dichlorobenzene	95-50-1				ND	12		ND	1.2		ND	1.2		ND	1.2
1,3-Dichlorobenzene	541-73-1				ND	12		ND	1.2		ND	1.2		ND	1.2
1,4-Dichlorobenzene	106-46-7				ND	12		ND	1.2		ND	1.2		ND	1.2
Dichlorodifluoromethane	75-71-8		3500		ND	9.9		ND	0.99		ND	0.99		ND	0.99
1,1-Dichloroethane	75-34-3		58		ND	8.1		ND	0.81		ND	0.81		ND	0.81
1,2-Dichloroethane	107-06-2				ND	8.1		ND	0.81		ND	0.81		ND	0.81
1,1-Dichloroethene	75-35-4	100 (1000)	7000		ND	7.9		ND	0.79		ND	0.79		1.4	0.79
1,2-Dichloroethene (cis)	156-59-2	100 (1000)			ND	7.9		ND	0.79		ND	0.79		ND	0.79
1,2-Dichloroethene (trans)	156-60-5				ND	7.9		ND	0.79		ND	0.79		ND	0.79
1,2-Dichloropropane	78-87-5		25		ND	9.2		ND	0.92		ND	0.92		0.97	0.92
1,3-Dichloropropene (cis)	10061-01-5				ND	9.1		ND	0.91		ND	0.91		ND	0.91
1,3-Dichloropropene (trans)	10061-02-6				ND	9.1		ND	0.91		ND	0.91		ND	0.91
1,3-Dichloropropene - TOTAL	542-75-6				ND	9.1		ND	0.91		ND	0.91		ND	0.91
1,2-Dichlorotetrafluoroethane	76-14-2				ND	14		ND	1.4		ND	1.4		ND	1.4
1,4-Dioxane	123-91-1				ND	7.2		ND	0.72		ND	0.72		ND	0.72
Ethylbenzene	100-41-4		37		ND	8.7		1.7	0.87		ND	0.87		1.8	0.87
n-Heptane	142-82-5		14000		ND	8.2		6.5	0.82		ND	0.82		3.0	0.82
1,3-Hexachlorobutadiene	87-68-3				ND	21		ND	2.1		ND	2.1		ND	2.1
n-Hexane	110-54-3		24000	D	25	7.1		9.6	0.71		ND	0.71		3.5	0.71
Methylene chloride	75-09-2		3400		ND	7.0		3.5	0.70		1.7	0.70	D	390	70
Methyl ethyl ketone	78-93-3		170000	D	11	5.9		7.7	0.59		0.65	0.59		3.7	0.59
Methyl isobutyl ketone	108-10-1		100000		ND	8.2		ND	0.82		ND	0.82		ND	0.82
Methyl tert-butyl ether	1634-04-4				ND	7.2		ND	0.72		ND	0.72		ND	0.72
Styrene	100-42-5		35000		ND	8.5		ND	0.85		ND	0.85		0.85	0.85
Tert-butyl alcohol	75-65-0		--		ND	6.1		ND	0.61		ND	0.61		ND	0.61
1,1,2,2-Tetrachloroethane	79-34-5				ND	14		ND	1.4		ND	1.4		ND	1.4
Tetrachloroethene	127-18-4	100 (1000)	360	D	**200**	14		1.7	1.4		ND	1.4		45	1.4
Toluene	108-88-3		170000		ND	7.5		13	0.75		ND	0.75		8.2	0.75
1,2,4-Trichlorobenzene	120-82-1				ND	15		ND	1.5		ND	1.5		ND	1.5
1,1,1-Trichloroethane	71-55-6	100 (1000)	170000		ND	11		17	1.1		ND	1.1		25	1.1
1,1,2-Trichloroethane	79-00-5		5.8		ND	11		ND	1.1		ND	1.1		**6.8**	1.1
Trichloroethene	79-01-6	5 (250)	16	D	**3000**	25		0.38	0.25		ND	0.25		**33**	0.25
Trichlorofluoromethane	75-69-4		--		ND	11		1.3	1.1		1.5	1.1		ND	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		170000		ND	15		ND	1.5		ND	1.5		ND	1.5
1,2,4-Trimethylbenzene	95-63-6		2100		ND	9.8		2.9	0.98		ND	0.98		52	0.98
1,3,5-Trimethylbenzene	108-67-8		2100		ND	9.8		ND	0.98		ND	0.98		28	0.98
2,2,4-Trimethylpentane	540-84-1		--		ND	9.3		2.1	0.93		ND	0.93		1.9	0.93
Vinyl bromide	593-60-2				ND	8.7		ND	0.87		ND	0.87		ND	0.87
Vinyl chloride	75-01-4	5 (250)	5.6		ND	5.1		ND	0.51		ND	0.51		ND	0.51
Xylenes (m&p)	179601-23-1		3500		ND	8.7		6.9	0.87		ND	0.87		6.0	0.87
Xylenes (o)	95-47-6		3500		ND	8.7		2.0	0.87		ND	0.87		3.3	0.87
Xylenes - TOTAL	1330-20-7		3500		ND	8.7		8.9	0.87		ND	0.87		9.3	0.87

(250) = Sub Slab Concentration requiring mitigation
D = Extra dilution required for this compound

Table 3.4: Sub Slab and Indoor Air Results Summary
Cottage Place Garden Street
New Rochelle, New York
SESI Job Number 9822

Compound	Sample Name: / IAL ID: / CAS#	NYSDEC / NYSDOH Guidance ug/m3	EPA Target Sub Slab Concentration ug/m3	SP-1 E18-00025-05 Q	SP-1 E18-00025-05 ug/m3	SP-1 E18-00025-05 RL ug/m3	SP-2 E18-00025-06 Q	SP-2 E18-00025-06 ug/m3	SP-2 E18-00025-06 RL ug/m3	SP-3 E18-00025-07 Q	SP-3 E18-00025-07 ug/m3	SP-3 E18-00025-07 RL ug/m3
Acetone	67-64-1		1100000		8.8	0.48	D	53	4.8		39	0.48
Benzene	71-43-2		12		0.90	0.64		ND	6.4		0.74	0.64
Bromodichloromethane	75-27-4				ND	1.3		ND	13		ND	1.3
Bromoform	75-25-2				ND	2.1		ND	21		ND	2.1
Bromomethane	74-83-9				ND	0.78		ND	7.8		ND	0.78
1,3-Butadiene	106-99-0				ND	0.44		ND	4.4		ND	0.44
Chlorobenzene	108-90-7				ND	0.92		ND	9.2		ND	0.92
Chloroethane	75-00-3				ND	0.53		ND	5.3		ND	0.53
Chloroform	67-66-3		4.1		ND	0.98		ND	9.8		ND	0.98
Chloromethane	74-87-3				ND	0.41		ND	4.1		ND	0.41
Carbon disulfide	75-15-0		24000		1.4	0.62		ND	6.2		2.4	0.62
Carbon tetrachloride	56-23-5	5 (250)	16		0.44	0.25		ND	2.5		0.38	0.25
Cyclohexane	110-82-7		210000		ND	0.69	D	94	6.9		130	0.69
Dibromochloromethane	124-48-1				ND	1.7		ND	17		ND	1.7
1,2-Dibromoethane	106-93-4				ND	1.5		ND	15		ND	1.5
1,2-Dichlorobenzene	95-50-1				ND	1.2		ND	12		ND	1.2
1,3-Dichlorobenzene	541-73-1				ND	1.2		ND	12		ND	1.2
1,4-Dichlorobenzene	106-46-7				ND	1.2		ND	12		ND	1.2
Dichlorodifluoromethane	75-71-8		3500		ND	0.99		ND	9.9		1.3	0.99
1,1-Dichloroethane	75-34-3		58		ND	0.81		ND	8.1		1.6	0.81
1,2-Dichloroethane	107-06-2				ND	0.81		ND	8.1		ND	0.81
1,1-Dichloroethene	75-35-4	100 (1000)	7000		ND	0.79		ND	7.9		66	0.79
1,2-Dichloroethene (cis)	156-59-2	100 (1000)			ND	0.79		ND	7.9		ND	0.79
1,2-Dichloroethene (trans)	156-60-5				ND	0.79		ND	7.9		2.1	0.79
1,2-Dichloropropane	78-87-5		25		ND	0.92		ND	9.2		ND	0.92
1,3-Dichloropropene (cis)	10061-01-5				ND	0.91		ND	9.1		ND	0.91
1,3-Dichloropropene (trans)	10061-02-6				ND	0.91		ND	9.1		ND	0.91
1,3-Dichloropropene - TOTAL	542-75-6				ND	0.91		ND	9.1		ND	0.91
1,2-Dichlorotetrafluoroethane	76-14-2				ND	1.4		ND	14		ND	1.4
1,4-Dioxane	123-91-1				ND	0.72		ND	7.2		ND	0.72
Ethylbenzene	100-41-4		37		ND	0.87		ND	8.7		ND	0.87
n-Heptane	142-82-5		14000		ND	0.82	D	67	8.2		2.2	0.82
1,3-Hexachlorobutadiene	87-68-3				ND	2.1		ND	21		ND	2.1
n-Hexane	110-54-3		24000		1.2	0.71	D	150	7.1	D	170	14
Methylene chloride	75-09-2		3400		2.1	0.70		ND	7.0		48	0.70
Methyl ethyl ketone	78-93-3		170000		1.4	0.59	D	6.8	5.9		6.0	0.59
Methyl isobutyl ketone	108-10-1		100000		ND	0.82		ND	8.2		0.94	0.82
Methyl tert-butyl ether	1634-04-4				ND	0.72		ND	7.2		ND	0.72
Styrene	100-42-5		35000		ND	0.85		ND	8.5		ND	0.85
Tert-butyl alcohol	75-65-0		--		ND	0.61		ND	6.1		1.2	0.61
1,1,2,2-Tetrachloroethane	79-34-5				ND	1.4		ND	14		ND	1.4
Tetrachloroethene	127-18-4	100 (1000)	360		ND	1.4		ND	14		**110**	1.4
Toluene	108-88-3		170000		1.0	0.75	D	11	7.5		6.1	0.75
1,2,4-Trichlorobenzene	120-82-1				ND	1.5		ND	15		ND	1.5
1,1,1-Trichloroethane	71-55-6	100 (1000)	170000		ND	1.1		ND	11	D	**740**	22
1,1,2-Trichloroethane	79-00-5		5.8		ND	1.1		ND	11		**130**	1.1
Trichloroethene	79-01-6	5 (250)	16		0.65	0.25		ND	2.5		**26**	0.25
Trichlorofluoromethane	75-69-4		--		1.5	1.1		ND	11		2.1	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		170000		ND	1.5		ND	15	D	2600	31
1,2,4-Trimethylbenzene	95-63-6		2100		ND	0.98		ND	9.8		ND	0.98
1,3,5-Trimethylbenzene	108-67-8		2100		ND	0.98		ND	9.8		ND	0.98
2,2,4-Trimethylpentane	540-84-1		--		ND	0.93	D	5400	93		1.9	0.93
Vinyl bromide	593-60-2				ND	0.87		ND	8.7		ND	0.87
Vinyl chloride	75-01-4	5 (250)	5.6		ND	0.51		ND	5.1		ND	0.51
Xylenes (m&p)	179601-23-1		3500		ND	0.87		ND	8.7		ND	0.87
Xylenes (o)	95-47-6		3500		ND	0.87		ND	8.7		ND	0.87
Xylenes - TOTAL	1330-20-7		3500		ND	0.87		ND	8.7		ND	0.87

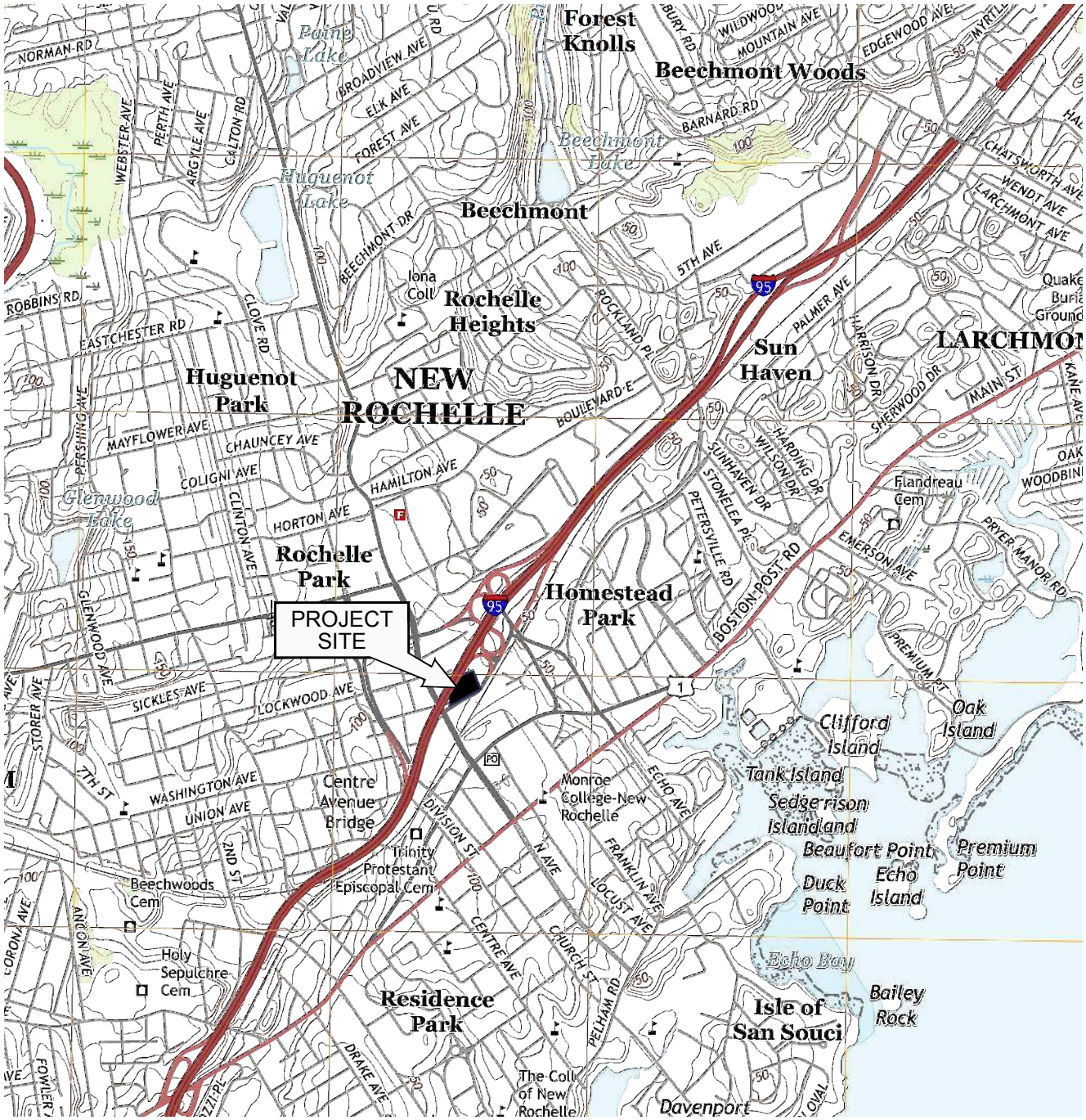
(250) = Sub Slab Concentration requiring mitigation
D = Extra dilution required for this compound

ITable 3.4: Sub Slab and Indoor Air Results Summary
Cottage Place Garden Street
New Rochelle, New York
SESI Job Number 9822

Compound	CAS#	Sample Name: / IAL ID:	NYSDEC / NYSDOH Guidance ug/m3	EPA Target Indoor Air Concentration ug/m3	IA-1 E18-00025-08 Q	IA-1 E18-00025-08 ug/m3	IA-1 E18-00025-08 RL ug/m3	IA-2 E18-00025-09 Q	IA-2 E18-00025-09 ug/m3	IA-2 E18-00025-09 RL ug/m3	IA-3 E18-00025-10 Q	IA-3 E18-00025-10 ug/m3	IA-3 E18-00025-10 RL ug/m3	IA-4 E18-00025-11 Q	IA-4 E18-00025-11 ug/m3	IA-4 E18-00025-11 RL ug/m3
Acetone	67-64-1			32000		6.1	0.48		ND	0.48		ND	0.48		ND	0.48
Benzene	71-43-2			0.36		**2.1**	0.64		**0.80**	0.64		**1.1**	0.64		**0.99**	0.64
Bromodichloromethane	75-27-4					ND	1.3		ND	1.3		ND	1.3		ND	1.3
Bromoform	75-25-2					ND	2.1		ND	2.1		ND	2.1		ND	2.1
Bromomethane	74-83-9					ND	0.78		ND	0.78		ND	0.78		ND	0.78
1,3-Butadiene	106-99-0					ND	0.44		ND	0.44		ND	0.44		ND	0.44
Chlorobenzene	108-90-7					ND	0.92		ND	0.92		ND	0.92		ND	0.92
Chloroethane	75-00-3					ND	0.53		ND	0.53		ND	0.53		ND	0.53
Chloroform	67-66-3			0.12		ND	0.98		**1.5**	0.98		ND	0.98		ND	0.98
Chloromethane	74-87-3					ND	0.41		ND	0.41		ND	0.41		ND	0.41
Carbon disulfide	75-15-0					ND	0.62		ND	0.62		ND	0.62		ND	0.62
Carbon tetrachloride	56-23-5		-- (5)	0.47		0.50	0.25		0.57	0.25		0.57	0.25		0.57	0.25
Cyclohexane	110-82-7			6300		1.7	0.69		ND	0.69		ND	0.69		ND	0.69
Dibromochloromethane	124-48-1					ND	1.7		ND	1.7		ND	1.7		ND	1.7
1,2-Dibromoethane	106-93-4					ND	1.5		ND	1.5		ND	1.5		ND	1.5
1,2-Dichlorobenzene	95-50-1					ND	1.2		ND	1.2		ND	1.2		ND	1.2
1,3-Dichlorobenzene	541-73-1					ND	1.2		ND	1.2		ND	1.2		ND	1.2
1,4-Dichlorobenzene	106-46-7					ND	1.2		ND	1.2		ND	1.2		ND	1.2
Dichlorodifluoromethane	75-71-8			100		2.6	0.99		ND	0.99		ND	0.99		2.3	0.99
1,1-Dichloroethane	75-34-3					ND	0.81		ND	0.81		ND	0.81		ND	0.81
1,2-Dichloroethane	107-06-2					ND	0.81		ND	0.81		ND	0.81		ND	0.81
1,1-Dichloroethene	75-35-4		-- (100)	210		ND	0.79		ND	0.79		ND	0.79		ND	0.79
1,2-Dichloroethene (cis)	156-59-2		-- (100)	--		ND	0.79		ND	0.79		ND	0.79		ND	0.79
1,2-Dichloroethene (trans)	156-60-5					ND	0.79		ND	0.79		ND	0.79		ND	0.79
1,2-Dichloropropane	78-87-5					ND	0.92		ND	0.92		ND	0.92		ND	0.92
1,3-Dichloropropene (cis)	10061-01-5					ND	0.91		ND	0.91		ND	0.91		ND	0.91
1,3-Dichloropropene (trans)	10061-02-6					ND	0.91		ND	0.91		ND	0.91		ND	0.91
1,3-Dichloropropene - TOTAL	542-75-6					ND	0.91		ND	0.91		ND	0.91		ND	0.91
1,2-Dichlorotetrafluoroethane	76-14-2					ND	1.4		ND	1.4		ND	1.4		ND	1.4
1,4-Dioxane	123-91-1					ND	0.72		ND	0.72		ND	0.72		ND	0.72
Ethylbenzene	100-41-4			1.1		1.1	0.87		ND	0.87		ND	0.87		ND	0.87
n-Heptane	142-82-5			420		2.1	0.82		ND	0.82		ND	0.82		ND	0.82
1,3-Hexachlorobutadiene	87-68-3					ND	2.1		ND	2.1		ND	2.1		ND	2.1
n-Hexane	110-54-3			730		3.4	0.71		ND	0.71		ND	0.71		1.0	0.71
Methylene chloride	75-09-2		60	100		1.6	0.70		ND	0.70		2.2	0.70		2.9	0.70
Methyl ethyl ketone	78-93-3					ND	0.59		ND	0.59		ND	0.59		ND	0.59
Methyl isobutyl ketone	108-10-1			3100		1.3	0.82		4.8	0.82		ND	0.82		ND	0.82
Methyl tert-butyl ether	1634-04-4					ND	0.72		ND	0.72		ND	0.72		ND	0.72
Styrene	100-42-5					ND	0.85		ND	0.85		ND	0.85		ND	0.85
Tert-butyl alcohol	75-65-0					ND	0.61		ND	0.61		ND	0.61		ND	0.61
1,1,2,2-Tetrachloroethane	79-34-5					ND	1.4		ND	1.4		ND	1.4		ND	1.4
Tetrachloroethene	127-18-4		100 (30)	11		ND	1.4		ND	1.4		ND	1.4		6.1	1.4
Toluene	108-88-3			5200		11	0.75		ND	0.75		1.1	0.75		1.1	0.75
1,2,4-Trichlorobenzene	120-82-1					ND	1.5		ND	1.5		ND	1.5		ND	1.5
1,1,1-Trichloroethane	71-55-6		-- (100)	5200		ND	1.1		ND	1.1		ND	1.1		15	1.1
1,1,2-Trichloroethane	79-00-5					ND	1.1		ND	1.1		ND	1.1		ND	1.1
Trichloroethene	79-01-6		5 (2)	0.48		0.54	0.25		ND	0.25		ND	0.25		ND	0.25
Trichlorofluoromethane	75-69-4			--		1.8	1.1		1.4	1.1		1.5	1.1		ND	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1					ND	1.5		ND	1.5		ND	1.5		ND	1.5
1,2,4-Trimethylbenzene	95-63-6					ND	0.98		ND	0.98		ND	0.98		ND	0.98
1,3,5-Trimethylbenzene	108-67-8					ND	0.98		ND	0.98		ND	0.98		ND	0.98
2,2,4-Trimethylpentane	540-84-1			--		1.7	0.93		ND	0.93		ND	0.93		ND	0.93
Vinyl bromide	593-60-2					ND	0.87		ND	0.87		ND	0.87		ND	0.87
Vinyl chloride	75-01-4		-- (5)			ND	0.51		ND	0.51		ND	0.51		ND	0.51
Xylenes (m&p)	179601-23-1			100		4.7	0.87		ND	0.87		ND	0.87		ND	0.87
Xylenes (o)	95-47-6			100		1.2	0.87		ND	0.87		ND	0.87		ND	0.87
Xylenes - TOTAL	1330-20-7			100		5.9	0.87		ND	0.87		ND	0.87		ND	0.87

(5) = Indoor Air Concentration requiring mitigation
D = Extra dilution required for this compound

FIGURES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 18T
10 000-foot ticks: New York Coordinate System of 1983 (east and long island zones)

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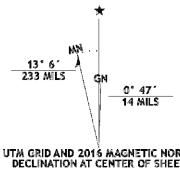
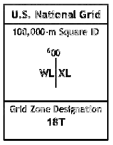
Imagery.....NAIP, June 2013
Roads..... U.S. Census Bureau, 2015 - 2016
Names.....GNIS, 2016
Hydrography.....National Hydrography Dataset, 2013
Contours.....National Elevation Dataset, 2015
Boundaries.....Multiple sources; see metadata file 1972 - 2016

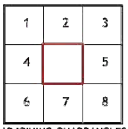
Wetlands.....FWS National Wetlands Inventory 1977 - 2014



UTM GRID AND 2016 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



QUADRANGLE LOCATION



1 Nyack
2 White Plains
3 Glenville
4 Yonkers
5 Mamaroneck
6 Central Park
7 Flushing
8 Sea Cliff
ADJOINING QUADRANGLES

GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

SITE LOCATION MAP

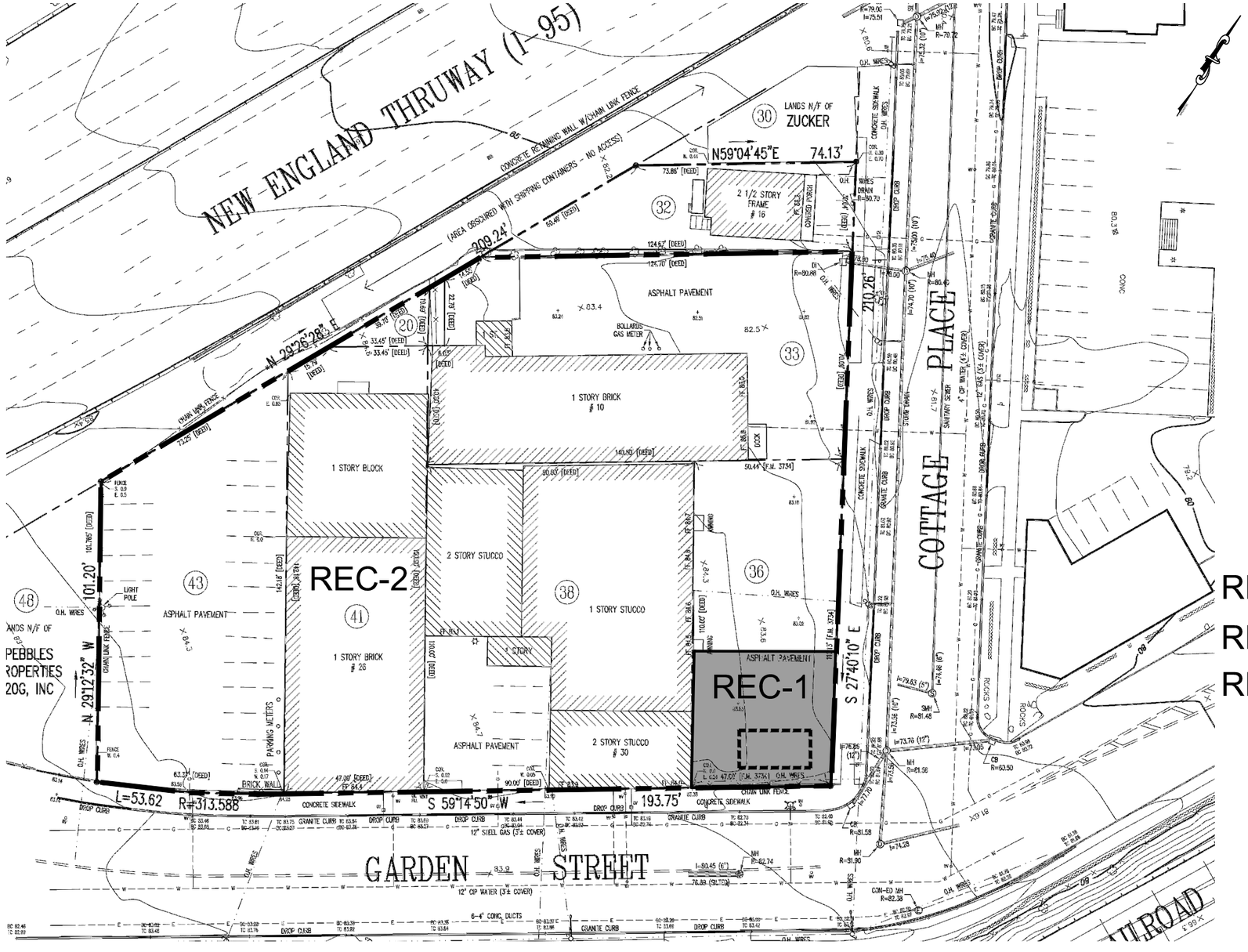
SESI CONSULTING ENGINEERS D.P.C.

SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL

12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

FIG-1.1
DRAWN BY: yy
CHECKED BY: FD
SCALE: N.T.S.
DATE: 07/31/18
JOB NO.: 9822

N:\ACAD\9822\9822 SITE LOCATION MAP.DWG 07/31/18 11:30:00AM, jenny, LAYOUT:FIG-1.1



SCALE: 1"=40'

0 40 80

REC-1 - UST

REC-2 - FORMER PLASTIC WORKS

REC-3 - HISTORIC FILL IS SITE-WIDE

LEGEND:

- PROPERTY BOUNDARY
- FORMER GAS STATION AREA WITH 2 ABANDONED USTS
- APPROXIMATE ABANDONED UST AREA

REFERENCE
SITE INFORMATION ARE TAKEN FROM "SURVEY OF PROPERTY PREPARED FOR THE MARK 95, LLC" PREPARED BY CONTRACTORS' LINE & GRADE LLC.JUNE 8, 2017. LATEST REV DATE 10/19/2017.

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

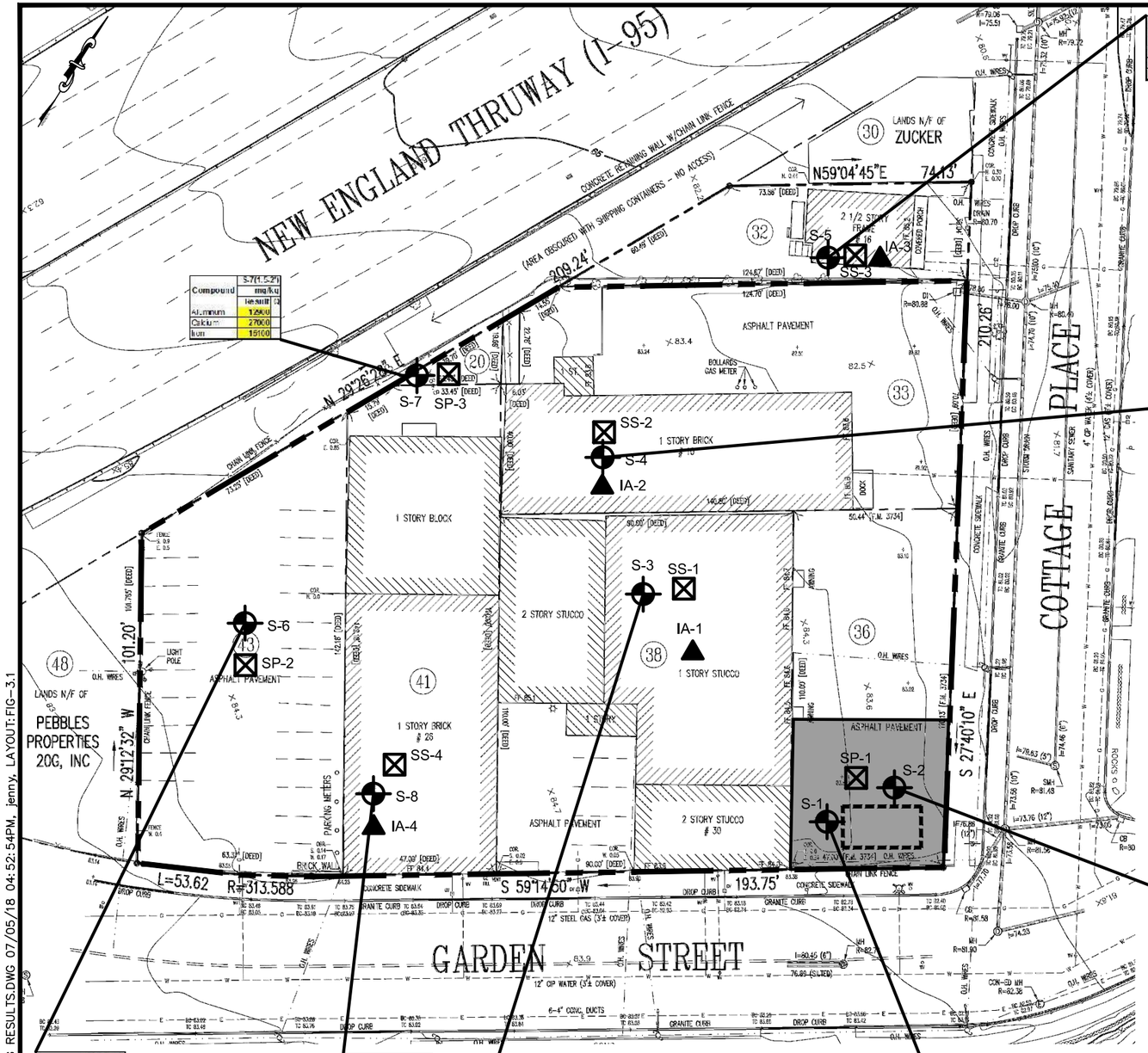
dwg by: yy
chk by: FD
scale: 1" = 40
date: 07/30/18

project: GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title: REC LOCATION PLAN

job no: 9822
drawing no: FIG-1.2

N:\ACAD\9822\9822 REC LOCATION PLAN.DWG 07/31/18 11:29:16AM, jenny, LAYOUT:FIG-1.2



Compound	S-5(1.5-2') mg/kg Result	Q
Aluminum	9550	
Calcium	2000	
Iron	15100	

Compound	S-7(1.5-2') mg/kg Result	Q
Aluminum	12000	
Calcium	27000	
Iron	15100	

	S-4(11-11.5') mg/kg Result	Q
Aluminum	7080	
Cadmium	0.097	J
Calcium	1750	
Copper	14.8	
Iron	13000	
Lead	4.0	
Nickel	19.1	
Silver	0.25	U
Zinc	27.2	
Mercury	0.012	J

	S-2(7.5-8') mg/kg Result	Q
Aluminum	11500	
Cadmium	0.099	J
Calcium	4811	J
Copper	17.3	
Iron	18500	
Lead	12	
Nickel	19.5	
Silver	0.25	U
Zinc	37.8	
Mercury	0.012	U

	S-6(5-6.5') mg/kg Result	Q
Aluminum	11100	
Calcium	1210	
Iron	18900	

Compound	S-8(4-4.5') mg/kg Result	Q
Aluminum	7750	
Calcium	21800	
Iron	14000	

	S-3(4.5-5') mg/kg Result	Q
Aluminum	11000	
Cadmium	0.12	U
Calcium	1580	
Copper	18.1	
Iron	18100	
Lead	4.0	
Nickel	25.7	
Silver	0.25	U
Zinc	37.1	
Mercury	0.012	U

	S-1(2-2.5') mg/kg Result	Q
Aluminum	9760	
Cadmium	18.2	
Calcium	12100	
Copper	137	
Iron	21900	
Lead	779	
Nickel	335	
Silver	3.0	
Zinc	762	
Mercury	2.1	

	S-1(2-7.5') mg/kg Result	Q
Benzo[a]anthracene	3.9	
Benzo[a]pyrene	3.6	
Benzo[b]fluoranthene	5.2	
Benzo[k]fluoranthene	1.9	
Chrysene	4.1	
Dibenz(a,h)anthracene	0.52	
Di-n-butylphthalate	0.11	J
Indeno(1,2,3-cd)pyrene	1.9	

	S-1(2-2.5') mg/kg Result	Q
Total PCBs	1.2	

	Unrestricted mg/kg	Residential mg/kg	Restricted Residential mg/kg
Aluminum	NR	NR	NR
Cadmium	2.5	2.5	4.3
Calcium	NR	NR	NR
Copper	50	270	270
Iron	NR	2500	NR
Lead	63	400	400
Nickel	30	140	310
Silver	2	36	180
Zinc	109	2200	10000

	Unrestricted mg/kg	Residential mg/kg	Restricted Residential mg/kg
Benzo[a]anthracene	1	1	1
Benzo[a]pyrene	1	1	1
Benzo[b]fluoranthene	1	1	1
Benzo[k]fluoranthene	0.8	1	3.9
Chrysene	1	1	3.9
Dibenz(a,h)anthracene	0.33	0.33	0.33
Di-n-butylphthalate	NA	100	NA
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5

LEGEND:

- PROPERTY BOUNDARY
- FORMER GAS STATION AREA WITH 2 ABANDONED USTS
- APPROXIMATE ABANDONED UST AREA
- S-1 - SOIL SAMPLE NUMBER & APPROX. LOCATION
- IA-1 - INDOOR AIR SAMPLE NUMBER & APPROX. LOCATION
- SS/SP - SUB-SLAB (SS) OR SUB-PAVEMENT (SP) SOIL GAS SAMPLE LOCATION

SCALE: 1"=40'

0 40 80

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION ARE TAKEN FROM "SURVEY OF PROPERTY PREPARED FOR THE MARK 95, LLC" PREPARED BY CONTRACTORS' LINE & GRADE LLC.JUNE 8, 2017. LATEST REV DATE 10/19/2017.

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

dwg by: EW
chk by: NL
scale: 1" = 40
date: 02/02/18

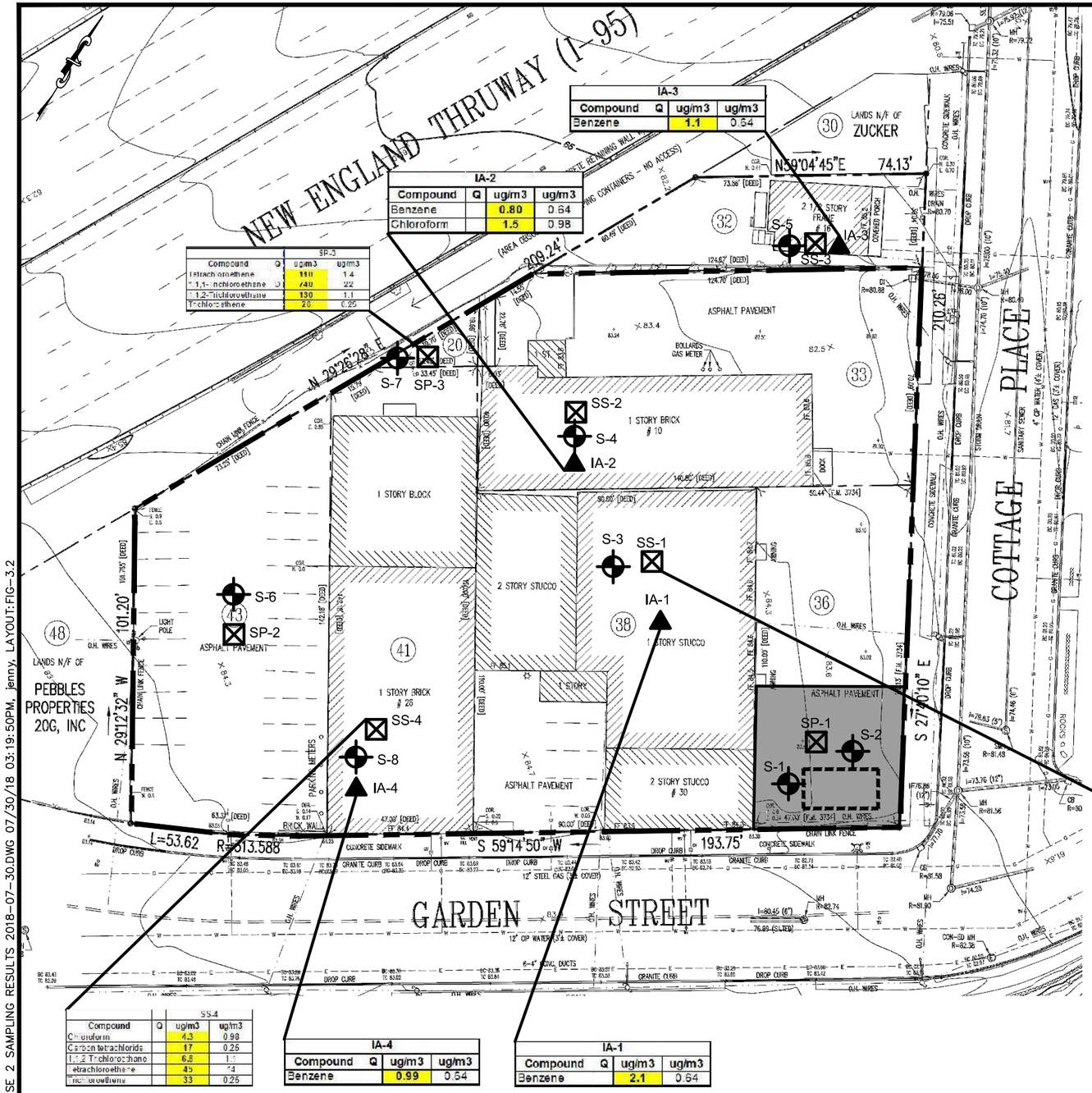
project:
GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title:
SOIL SAMPLING RESULTS PLAN

job no: 9822
drawing no:

FIG-3.1

N:\ACAD\9822\9822 PHASE 2 SAMPLING RESULTS.DWG 07/05/18 04:52:54PM, jenny, LAYOUT:FIG-3.1



IA-3			
Compound	Q	ug/m3	ug/m3
Benzene		1.1	0.64

IA-2			
Compound	Q	ug/m3	ug/m3
Benzene		0.80	0.64
Chloroform		1.5	0.98

SP-3			
Compound	Q	ug/m3	ug/m3
Tetrachloroethene		110	1.4
1,1,1- Trichloroethane		730	22
1,1,2-Trichloroethane		130	1.1
Trichloroethene		28	0.25

SS-4			
Compound	Q	ug/m3	ug/m3
Chloroform		4.3	0.98
Carbon tetrachloride		17	0.25
1,1,2 Trichloroethane		6.8	1.1
Tetrachloroethene		45	1.4
Trichloroethene		33	0.25

IA-4			
Compound	Q	ug/m3	ug/m3
Benzene		0.99	0.64

IA-1			
Compound	Q	ug/m3	ug/m3
Benzene		2.1	0.64

SS-1			
Compound	Q	ug/m3	ug/m3
Tetrachloroethene	D	200	14
Trichloroethene	D	2900	25

Compound	NYSDEC / NYSDOH Guidance	EPA Target Sub Slab Concentrat
	ug/m3	ug/m3
Chloroform	NS	4.1
Carbon tetrachloride	5	16
Tetrachloroethene	30	360
1,1,1-Trichloroethane	100	170000
1,1,2-Trichloroethane	NS	5.8
Trichloroethene	2	16
NS = No Standard		
D = Extra dilution required for this compound		

Compound	NYSDEC / NYSDOH Guidance	EPA Target Indoor Air Concentrat
	ug/m3	ug/m3
Benzene		0.36
Chloroform		0.12
(5) = Indoor Air Concentration requiring mitigation		
D = Extra dilution required for this compound		

LEGEND:

- PROPERTY BOUNDARY
- FORMER GAS STATION AREA WITH 2 ABANDONED USTS
- APPROXIMATE ABANDONED UST AREA
- S-1 - SOIL SAMPLE NUMBER & APPROX. LOCATION
- IA-1 - INDOOR AIR SAMPLE NUMBER & APPROX. LOCATION
- SUB-SLAB (SS) OR SUB-PAVEMENT (SP) SOIL GAS SAMPLE LOCATION

SCALE: 1"=40'

0 40 80

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE
SITE INFORMATION ARE TAKEN FROM "SURVEY OF PROPERTY PREPARED FOR THE MARK 95, LLC" PREPARED BY CONTRACTORS' LINE & GRADE LLC.JUNE 8, 2017. LATEST REV DATE 10/19/2017.

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-9050

dwg by: yy
chk by: JS
scale: 1" = 40
date: 01/29/18

project:
GARDEN STREET RESIDENCES
NEW ROCHELLE, WESTCHESTER COUNTY, NY

drawing title:
SOIL VAPOR SAMPLING RESULTS PLAN

job no: 9822
drawing no:

FIG-3.2

N:\ACAD\9822\9822 PHASE 2 SAMPLING RESULTS 2018-07-30.DWG 07/30/18 03:19:50PM, jenny, LAYOUT:FIG-3.2

APPENDIX B

Soil Boring/ MW Construction Logs

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-9**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED:	5/8/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/8/2019	0 Hr. 20' 24 Hr. Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0			6" Asphalt	0
							0
	32				S-9 (2.5-3)		0
							0
5				5		Brown coarse to fine SAND, some Silt, trace Clay	0
			5				0
							0
	48						0
					S-9 (8-8.5)		0
10				10		Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
			10				0
							0
	48						0
							0
15				15	S-9 (14.5-15)	Gray-Brown coarse to fine SAND, little Silt, fine Gravel	0
			15				0
							0
	44				S-9 (17.5-18)		0
							0
20							0
						(Wet)	0
							0
	28						0
				24	S-9 (23.5-24)	Gray-Brown fine SAND and fine Gravel.	0
25						Complete at 24.0 Feet	
						Geoprobe refusal	
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-10**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED:	5/8/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/8/2019	0 Hr. / NE / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
				2		Brown coarse to fine SAND, some Silt, trace Clay	0
	30		2	3		Light brown Clayey SILT	0
			3				0
5				5	S-10 (4.5-5)		0
			5				0
							0
	46						0
					S-10 (8.5-9)	Brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
10				10		with few Cobbles	0
			10				0
					S-10 (11.5-12)		0
	50						0
						(Weathered rock)	0
15				15		Gray-brown coarse to fine SAND, some coarse to fine Gravel	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-11**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED: 5/8/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/8/2019	0 Hr. / 24 Hr. / Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	30				S-11 (2-2.5)		0
							0
5						FILL: Brown coarse to fine SAND, some Silt, little coarse to fine Gravel with Brick, Concrete	0
				6			0
			6		S-11 (6.5-7)		0
	40						0
							0
10				10		Light brown coarse to fine SAND, little Silt, trace Clay	0
			10				0
							0
	48				S-11 (13-13.5)		0
							0
15				15		Gray-brown coarse to fine SAND, little Silt, trace Clay	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-12**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED: 5/7/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/7/2019	0 Hr.	24 Hr. Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	20				S-12 (2-2.5)		0
							0
5				5		Light brown coarse to fine SAND, some Silt, little coarse to fine Gravel	0
			5				0
					S-12 (6.5-7)		0
	42						0
							0
10							0
					S-12 (11-11.5)		0
	22			12		Gray-brown coarse to fine SAND, some Silt, trace Clay	0
						Complete at 12.0 Feet	
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-13**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED:	5/7/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/7/2019	0 Hr. / NE / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0			6" Asphalt	0
							0
	34				S-13 (2-2.5)		0
				4		Light brown Clayey SILT	0
5			4	5		Light brown coarse to fine SAND, some Silt, trace Gravel	0
			5				0
							0
	46						0
					S-13 (8-8.5)		0
10							0
							0
	18			12	S-13 (11.5-12)	Brown coarse to fine SAND, some Silt, trace Clay	0
						Complete at 12.0 Feet	
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-14**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED:	5/7/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/7/2019	0 Hr. / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	28			3		Light brown Clayey SILT	0
			3				0
5				5	S-14 (4-4.5)	Light brown coarse to fine SAND, some Silt, trace Clay.	0
			5			Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
				7			0
	46		7				0
							0
10					S-14 (9-9.5)		0
					S-14 (10.5-11)	Gray-brown coarse to fine SAND, some Silt, trace coarse to fine Gravel	0
	20			12			0
						Complete at 12.0 Feet	0
							0
15							0
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-15**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED:	5/7/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/7/2019	0 Hr. / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	32			3	S-15 (2-2.5)	Light brown Clayey SILT	0
			3				0
5				5		Brown coarse to fine SAND, little Silt, trace Clay	0
			5				0
							0
	42						0
					S-15 (8-8.5)	Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
10				10			0
			10				0
	18			12	S-15 (11-11.5)	Light brown coarse to fine SAND, little Silt, trace Clay	0
						Complete at 12.0 Feet	
15							
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-16**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED:	5/7/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/7/2019	0 Hr. / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	30						0
				4	S-16 (3-3.5)	Brown coarse to fine SAND, some Silt, trace Clay	0
5			4	5		White weathered rock, Boulders	0
			5			Gray-brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
				7			0
	38		7		S-16 (7-7.5)		0
							0
10				10		Light brown coarse SAND, little coarse Gravel with cobbles	0
			10				0
					S-16 (11.5-12)		0
	44						0
							0
15				15		Brown coarse to fine SAND, little coarse to fine Gravel, trace Silt.	0
						Complete at 15.0	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-17**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED:	5/7/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/7/2019	0 Hr. / NE / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	28				S-17 (3-3.5)		0
							0
5				5		Light brown coarse to fine SAND, little Silt, trace Clay	0
			5				0
							0
	38				S-17 (7-7.5)		0
							0
10				10		Light brown coarse to fine SAND, some Silt, trace coarse to fine Gravel	0
			10				0
							0
	42						0
					S-17 (13.5-14)		0
15				15		Gray-brown coarse to fine SAND, some Silt, trace Clay	0
						Complete at 15 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-18**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY:	Aarco (Tom)	DATE STARTED:	5/7/2019
INSPECTOR:	JCS	DATE COMPLETED:	5/7/2019

GROUNDWATER TABLE DEPTH: 0 Hr. | NE | 24 Hr. | Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	32				S-18 (2-2.5)		0
							0
5				5		Light brown coarse to fine SAND, some Silt, little Clay	0
			5				0
					S-18 (6-6.5)		0
	44						0
							0
10				10		Light brown coarse to fine SAND, little Silt, trace Clay	0
			10				0
							0
	48			13	S-18 (12-12.5)	Gray-brown coarse to fine SAND, little Silt, trace coarse to fine Gravel with few Cobbles.	0
			13				0
15				15		Gray-brown fine SAND, some Silt, trace Clay.	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-19**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED: 5/7/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/7/2019	0 Hr. NE 24 Hr. Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
					S-19 (1.5-2)		0
	36						0
							0
5							0
							0
					S-19 (7-7.5)		0
	40						0
							0
10				10		Light-brown coarse to fine SAND, some Silt, little Clay	0
			10				0
					S-19 (12-12.5)		0
	48						0
						Gray-brown coarse to fine SAND, little Silt, trace coarse to fine	0
15				15		Gravel	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-20**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED: 5/7/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/7/2019	0 Hr. 20' 24 Hr. Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0			6" Asphalt	0
							0
	32						0
							0
5					S-20 (4.5-5)		0
							0
				7		Gray-brown coarse to fine SAND, some Silt, trace Clay	0
	46		7			(weathered rock)	0
							0
10				10	S-20 (9-9.5)	Light brown coarse to fine SAND, little Silt, trace Clay	0
			10				0
							0
	48						0
							0
15					S-20 (14-14.5)		0
					.		0
							0
	50				S-20 (17.5-18)		0
							0
20				20		Gray-brown coarse to fine SAND, little Silt, trace Coarse to fine Gravel	0
			20		S-20 (20-20.5)		0
	26						0
				23		Gray-brown coarse to fine SAND, little coarse to fine Gravel, trace Silt (Wet)	0
						Complete at 23.0 Feet	
25						Geoprobe refusal	
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-21**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED:	5/8/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/8/2019	0 Hr. / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
				2		FILL: Brown coarse to fine SAND, some silt, trace Clay with Brick	0
	28		2	3	S-21 (3-3.5)	Light brown Clayey SILT	0
			3				0
5				5		Light brown coarse to fine SAND, some Silt, little Clay	0
			5				0
							0
	40						0
					S-21 (8-8.5)		0
10							0
							0
				12		Brown coarse to fine SAND, little Silt, trace Clay	0
	44		12				0
							0
15				15	S-21 (14-14.5)	Gray-brown fine SAND, some fine Gravel, trace Silt.	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-22**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED: 5/8/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/8/2019	0 Hr. NE 24 Hr. Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
					S-22 (1.5-2)		0
	34						0
							0
5				5		Brown coarse to fine SAND, some Silt, little Clay	0
			5		S-22 (5.5-6)		0
							0
	46						0
							0
10				10		Light brown coarse to fine SAND, little Silt, trace Clay	0
			10		S-22 (10.5-11)		0
							0
	48						0
							0
15				15		Gray-brown fine SAND, little Silt, trace fine Gravel.	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-23**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED: 5/8/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/8/2019	0 Hr. NE 24 Hr. Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
				2		Light brown Clayey SILT	0
	26		2				0
							0
5				5	S-23 (4-4.5)	Brown coarse to fine SAND, some Silt, little Clay	0
			5				0
							0
	38						0
							0
10				10	S-23 (9-9.5)	Brown coarse to fine SAND, little Silt, trace Clay	0
			10				0
							0
	50						0
					S-23 (13.5-14)		0
15				15		Gray-brown fine SAND, little Silt, trace Clay	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-24**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED: 5/7/2019	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 5/7/2019	0 Hr. NE 24 Hr. Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	30			3		Light-brown Clayey SILT, some coarse to fine Sand	0
			3				0
5				5	S-24 (4.5-5)	Light-brown coarse to fine SAND, some Silt, trace Clay	0
			5				0
							0
	46						0
							0
10				10	S-24 (9-9.5)	Brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
			10				0
							0
	50						0
							0
15				15	S-24 (14.5-15)	Gray-brown coarse to fine SAND, little Silt, trace Clay	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-25**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Sergio)	DATE STARTED:	5/8/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/8/2019	0 Hr. / NE / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	24			3	S-25 (2.5-3)	FILL: Brown coarse to fine SAND, some Silt, trace Clay with Brick.	0
			3				0
5							0
				6		Light brown coarse to fine SAND, some Silt, trace Clay.	0
			6		S-25 (6.5-7)		0
	36						0
							0
10							0
							0
							0
	48				S-25 (12-12.5)		0
							0
15				15		Light brown coarse to fine SAND, little Silt, trace Clay	0
						Complete at 15.0 Feet	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**S-26**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	90'
GEOPROBE BY: Aarco (Tom)	DATE STARTED:	5/7/2019	GROUNDWATER TABLE DEPTH:
INSPECTOR: JCS	DATE COMPLETED:	5/7/2019	0 Hr. / 24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0			FILL: Brown coarse to fine SAND, little Silt, trace Gravel with Cobbles, Brick, and Concrete	0
	32			2			0
			2		S-26 (3-3.5)		0
							0
5							0
							0
							0
	40				S-26 (8-8.5)	(White weathered rock)	0
						Light-brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
10				10			0
			10				0
							0
	54				S-26 (13-13.5)		0
							0
15							0
							0
							0
	52						0
					S-26 (18.5-19)		0
20							0
							0
	30					Gray-brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
				23	S-26 (22.5-23)		0
						Complete at 23.0 Feet	
25						Geoprobe refusal	
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-27**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/23/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JRN	DATE COMPLETED: 9/23/19	0 Hr.	24 Hr. Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	40	1					0
							0
5							0
							0
							0
	38	2					0
							0
10							0
				11		Brown coarse to fine SAND, little coarse to fine Gravel, trace Silt	0
			11				0
	42	3			SB-27 (12-14)		0
							0
15							0
					SB-27 (15-17)		0
							0
	46	4					0
					SB-27 (18-20)	(weathered rock)	0
20				20		Brown gray coarse to fine SAND, little coarse to fine Gravel, trace Silt	0
						Boring complete at ±20 Feet BGS	
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-28**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/23/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JRN	DATE COMPLETED: 9/23/19	0 Hr.	24 Hr. / Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	28	1				Light brown yellow coarse to fine SAND, little Clay, trace coarse	0
				4		to fine Gravel	0
5			4				0
							0
							0
	36	2					0
				9		Brown coarse to fine SAND, little coarse to fine Gravel, trace Silt	0
10			9				0
							0
							0
	44	3					0
					SB-28 (12-14) (DUP)		0
15				15		Gray brown coarse to fine SAND, little coarse to fine Gravel, little Silt	0
			15		SB-28 (15-17)		0
							0
	42	4					0
					SB-28 (18-20)	Gray brown coarse to fine SAND, little coarse to fine Gravel, trace	0
20				20		Silt	0
						Boring complete at ±20 Feet BGS	
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-29**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA

GEOPROBE BY:	Aarco	DATE STARTED:	9/26/19	GROUNDWATER TABLE DEPTH:			
INSPECTOR:	JRN	DATE COMPLETED:	9/26/19	0 Hr.		24 Hr.	Date

DEPTH (ft) 0	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
			0			Dark gray-brown coarse to fine SAND, little coarse to fine Gravel, little Clay	0
				2			0
	30	1	2				0
							0
5							0
							0
				7		Brown coarse to fine SAND, little coarse to fine Gravel, trace Clay	0
	38	2	7				0
							0
10							0
							0
							0
	46	3		13	SB-29 (12-14)	Gray-brown coarse to fine SAND, some coarse to fine Gravel, trace Silt	0
			13				0
15							0
							0
					SB-29 (15-17)		0
	42	4					0
							0
20				20	SB-29 (18-20)	Dark gray-brown coarse to fine SAND, little coarse to fine Gravel, little Clay	0
						Boring complete at ±20 Feet BGS	
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: ____________ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-30**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/26/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JRN	DATE COMPLETED: 9/26/19	0 Hr. / 24 Hr. / Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	36	1			SB-30 (2-3)		0
							0
5							0
							0
							0
	40	2					0
				9	SB-30 (8-9)	Brown coarse to fine SAND, little coarse to fine Gravel, trace Silt	0
10			9				0
							0
					SB-30 (11-12)		0
	42	3					0
							0
15							0
							0
							0
	46	4					0
					SB-30 (17-18)	Gray brown coarse to fine SAND, little coarse to fine Gravel, trace	0
20				20		Silt	0
						Boring complete at ±20 Feet BGS (Refusal)	
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-31**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/27/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 9/27/19	0 Hr. / 24 Hr. / Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	30	1			SB-31 (2.5-3)		0
							0
5							0
							0
							0
	34	2		8	SB-31 (7.5-8)	FILL: Brown coarse to fine SAND, little Silt, trace Clay	0
			8				0
10							0
							0
							0
	40	3			SB-31 (12.5-13)		0
							0
15							0
							0
	38	4					0
					SB-31 (18-18.5)		0
20							0
							0
	42	5			SB-31 (22.5-23)		0
							0
25						(moist)	0
							0
	46	6		28	SB-31 (27.5-28)	Brown gray coarse to fine SAND, some Silt, trace Clay	0
						Boring Complete at ±28 Feet BGS (Refusal)	
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-32**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/27/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 9/27/19	0 Hr. / 24 Hr. / Date	

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	28	1		3	SB-32 (3-3.5)	FILL: Brown coarse to fine SAND, some Silt, little Clay	0
			3				0
5				5		Brown coarse to fine SAND, little Silt, trace Clay	0
			5				0
							0
	32	2			SB-32 (7-7.5)		0
							0
10							0
							0
					SB-32 (11-11.5)		0
	36	3					0
							0
15							0
							0
					SB-32 (16-16.5)		0
	42	4					0
							0
20							0
							0
					SB-32 (21.5-22)		0
	46	5					0
							0
25				25		Brown gray coarse to fine SAND, little Silt, trace Clay	0
						Boring complete at ±25 Feet BGS (Refusal)	
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-33**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/27/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 9/27/19	0 Hr.	24 Hr. Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
							0
	30	1		3		Brown coarse to fine SAND, little Silt, trace Clay	0
			3		SB-33 (3.5-4)		0
5							0
							0
							0
	36	2					0
					SB-33 (8.5-9)		0
10				9		Brown coarse to fine SAND, trace Silt	0
			9				0
							0
	40	3					0
					SB-33 (13.5-14)		0
15							0
							0
							0
	42	4					0
					SB-33 (18.5-19)		0
20							0
							0
							0
	44	5					0
				24	SB-33 (23.5-24)	Brown gray coarse to fine SAND, little Silt, trace Clay	0
25						Boring complete at ±24 Feet BGS (Refusal)	
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #

SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage Place	GEOPROBE NO.	**SB-34**
LOCATION:	New Rochelle, NY	JOB NO.	10491
METHOD:	Direct Push	GROUND ELEVATION:	NA
GEOPROBE BY: Aarco	DATE STARTED: 9/27/19	GROUNDWATER TABLE DEPTH:	
INSPECTOR: JCS	DATE COMPLETED: 9/27/19	0 Hr.	24 Hr. Date

DEPTH (ft)	RECOVERY (in)	SAMPLE TUBE No.	DEPTH FROM (ft)	DEPTH TO (ft)	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DESCRIPTION AND STRATIFICATION	PID
0			0				0
					SB-34 (1.5-2)		0
	38	1					0
							0
5							0
							0
					SB-34 (6.5-7)		0
	42	2					0
							0
10				10		Brown coarse to fine SAND, some Silt, trace Clay	0
			10				0
					SB-34 (11.5-12)		0
	44	3					0
							0
15				15		Brown gray coarse to fine SAND, little Silt, trace Clay	0
						Boring complete at ±15 Feet BGS (Refusal)	
20							
25							
30							
35							
40							

Nominal I.D. of Hole	in.
Nominal I.D. of Barrel Sampler	1⅜ in

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Pp: Pocket Penetrometer; DP: Direct Push

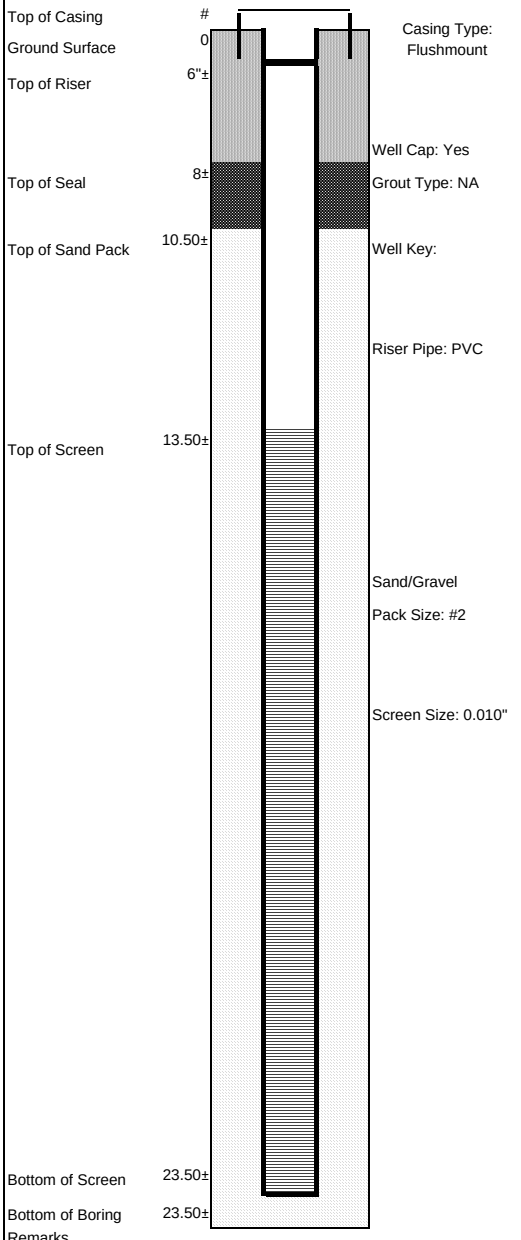
Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE

SESI CONSULTING ENGINEERS	PROJECT NAME:	Cottage place	MONITORING WELL NO.	**MW-1**
	PROJECT LOCATION:	New Rochelle, NY	JOB NO.	10491
			GROUND ELEVATION:	82.45'

BORING BY: Aarco	DATE STARTED	5/10/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2"
INSPECTOR: JCS	DATE COMPLETED	5/10/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	4"
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/13/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	15.48



DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
5							Light brown coarse to fine SAND, little Silt, trace Clay	0
								0
								0
								0
								0
10							Brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
								0
								0
								0
								0
15							Gray brown coarse to fine SAND, little Silt, coarse to fine Gravel	0
								0
							Hit refusal with auger at 15' (bedrock/weathered rock), switched to air rotary	0
								0
								0
20								0
							Fracture in rock encountered at 21'	0
								0
								0
								0
25							Complete at 23.50± Feet	
30								
35								
40								

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

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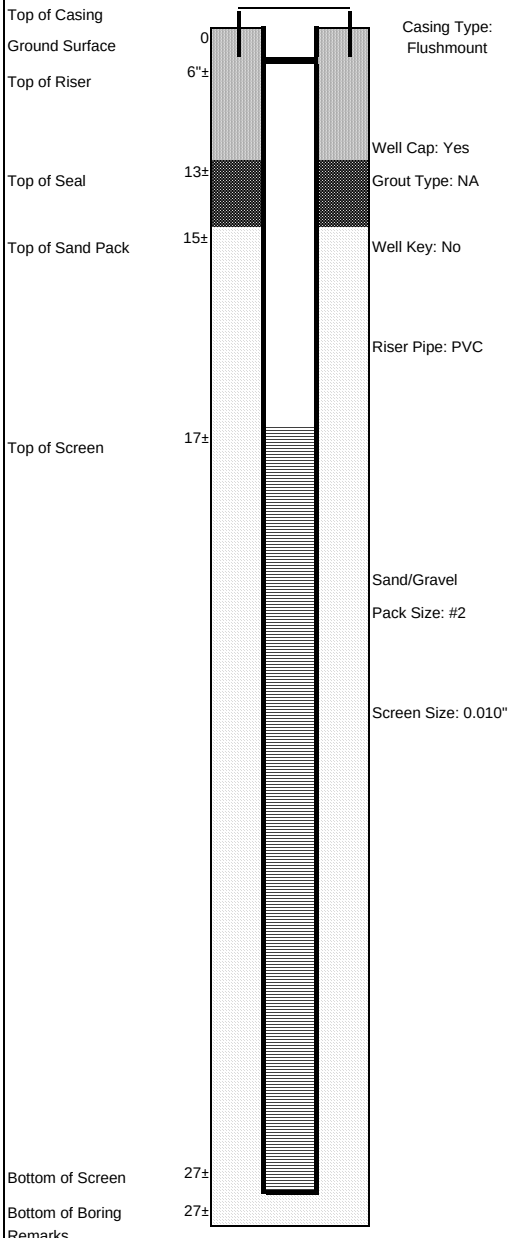
SESI CONSULTING ENGINEERS	PROJECT NAME:	Cottage place			MONITORING WELL NO.	**MW-2**
	PROJECT LOCATION:	New Rochelle, NY			JOB NO.	10491
					GROUND ELEVATION:	82.92'
BORING BY: Aarco	DATE STARTED	5/10/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2
INSPECTOR: JCS	DATE COMPLETED	5/10/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	4
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/13/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	18.83



DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
5							Brown coarse to fine SAND, some Silt, little Clay	0
								0
								0
								0
								0
10							Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
								0
								0
								0
								0
15								0
								0
								0
								0
								0
20								0
								0
								0
								0
								0
25								0
								0
							Gray brown fine SAND, little Silt, trace fine Gravel	0
							Complete at 27.00± Feet	
30								
35								
40								

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

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SESI CONSULTING ENGINEERS	PROJECT NAME:	Cottage place			MONITORING WELL NO.	**MW-3S**
	PROJECT LOCATION:	New Rochelle, NY			JOB NO.	10491
					GROUND ELEVATION:	83.25'
BORING BY: Aarco	DATE STARTED	5/13/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2
INSPECTOR: JCS	DATE COMPLETED	5/13/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	4
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/13/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	17.54

DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
5							Light brown coarse to fine SAND, some Silt, little Clay	0
								0
								0
								0
								0
10							Brown coarse to fine SAND, little Silt, trace Clay	0
								0
								0
								0
								0
15								0
								0
								0
								0
								0
20								0
								0
								0
								0
								0
25								0
								0
							Gray brown fine SAND, little Silt, trace fine Gravel	0
							Complete at 26.50± Feet	
30								
35								
40								

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

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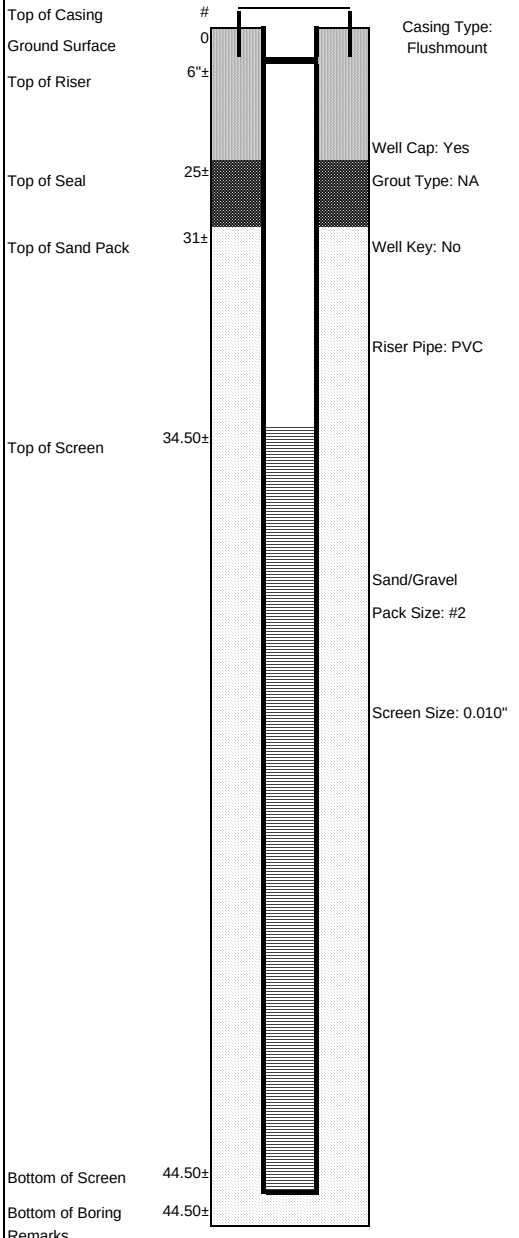
SESI CONSULTING ENGINEERS	PROJECT NAME:	Cottage place	MONITORING WELL NO.	**MW-3D**
	PROJECT LOCATION:	New Rochelle, NY	JOB NO.	10491
			GROUND ELEVATION:	83.31'

BORING BY: Aarco	DATE STARTED	5/13/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2
INSPECTOR: JCS	DATE COMPLETED	5/14/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	6
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/14/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	18.2



DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
5							Light brown coarse to fine SAND, some Silt, little Clay	0
								0
								0
								0
								0
10							Brown coarse to fine SAND, little Silt, trace Clay	0
								0
								0
								0
								0
15								0
								0
								0
								0
								0
20								0
								0
								0
								0
								0
25								0
								0
								0
								0
								0
30							Gray brown fine SAND, little Silt, trace fine Gravel	0
								0
								0
								0
								0
35								0
								0
								0
								0
								0
40							Brown fine SAND, little Silt, trace fine Gravel	

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

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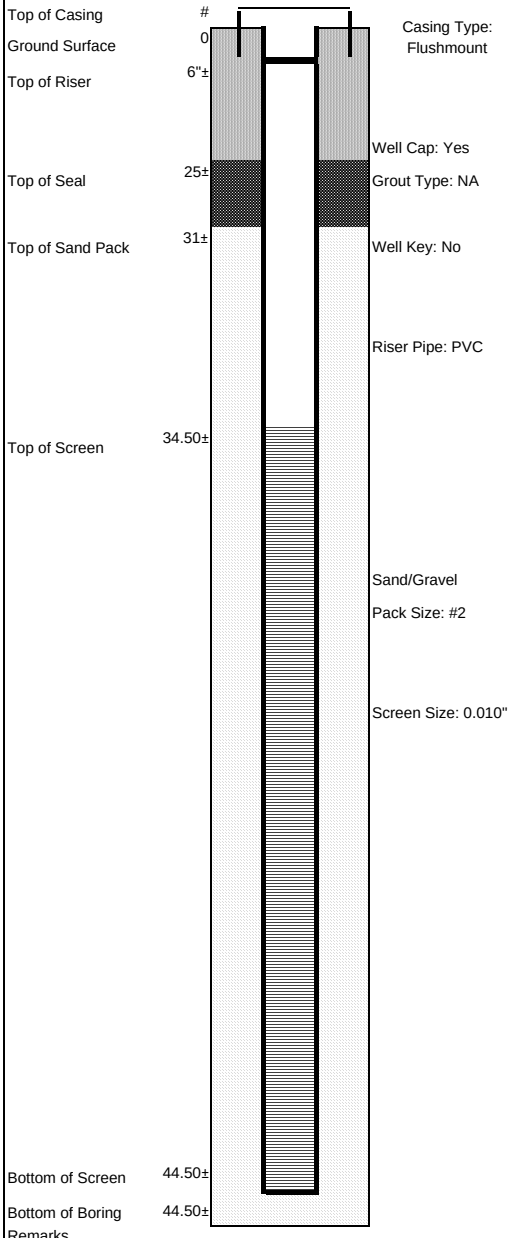
SESI CONSULTING ENGINEERS

PROJECT NAME:	Cottage place	MONITORING WELL NO.	**MW-3D**	
PROJECT LOCATION:	New Rochelle, NY	JOB NO.	10491	
		GROUND ELEVATION:	83.31	

BORING BY: Aarco	DATE STARTED	5/13/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2
INSPECTOR: JCS	DATE COMPLETED	5/13/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	6
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/14/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	18.2



DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
45							Brown fine SAND, little Silt, trace fine Gravel	0
							Complete at 44.50± Feet	
50								
55								
60								
25								
65								
70								
75								

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

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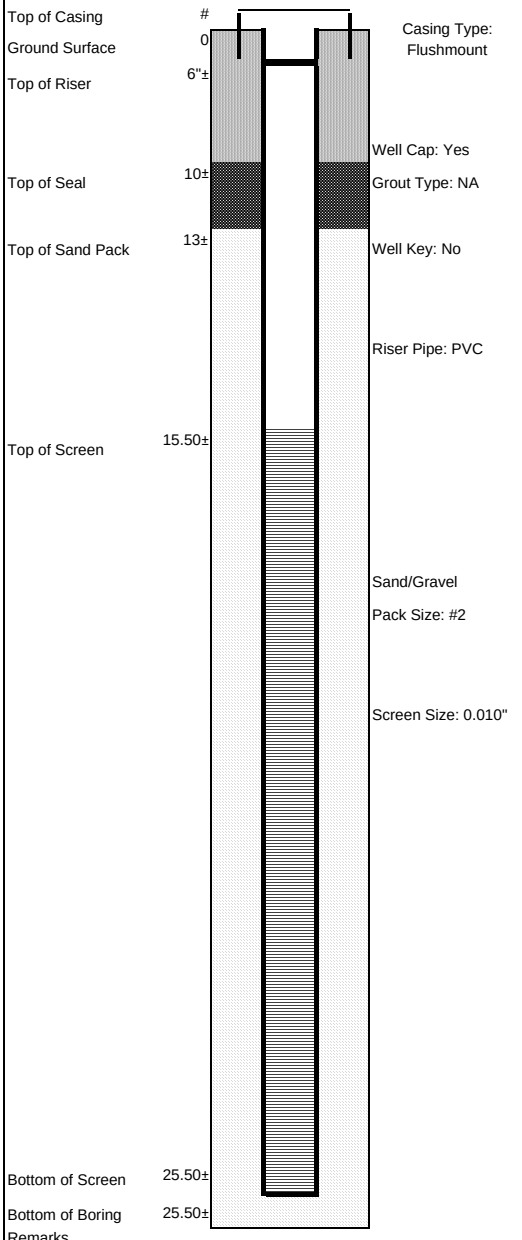
SESI CONSULTING ENGINEERS	PROJECT NAME:	Cottage place		MONITORING WELL NO.	**MW-4**
	PROJECT LOCATION:	New Rochelle, NY		JOB NO.	10491
				GROUND ELEVATION:	82.83

BORING BY: Aarco	DATE STARTED	5/14/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2
INSPECTOR: JCS	DATE COMPLETED	5/14/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	4
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/14/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	18.77



DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
5							Brown coarse to fine SAND, some Silt, little Clay	0
								0
								0
								0
								0
10							Light brown coarse to fine SAND, little Silt, trace Clay	0
								0
								0
								0
								0
15								0
								0
								0
								0
								0
20								0
								0
								0
								0
								0
25							Gray brown fine SAND, little Silt, trace fine Gravel.	0
							Complete at 25.0± Feet	
30								
35								
40								

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

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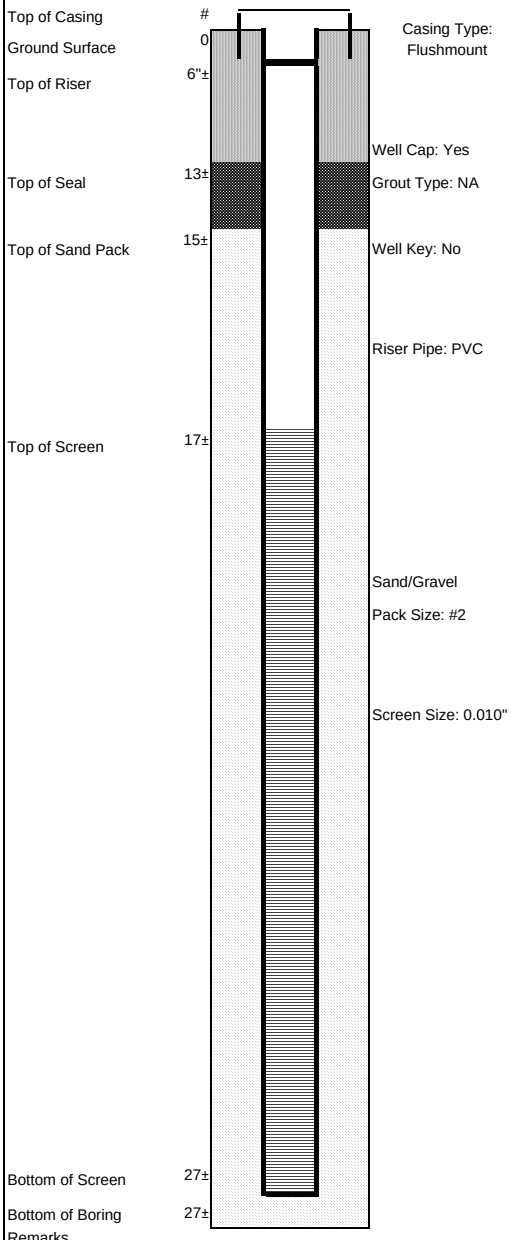
SESI CONSULTING ENGINEERS	PROJECT NAME:	Cottage place		MONITORING WELL NO.	**MW-5**
	PROJECT LOCATION:	New Rochelle, NY		JOB NO.	10491
				GROUND ELEVATION:	83.65'

BORING BY: Aarco	DATE STARTED	5/13/19	DEVELOPMENT PERIOD	1 Hour	INSIDE CASING DIAMETER (in)	2
INSPECTOR: JCS	DATE COMPLETED	5/13/19	DEVELOPMENT METHOD	Sub Pump	BOREHOLE DIAMETER (in)	4
NJ DEP PERMIT NO.:	DATE DEVELOPED	5/14/19	DEVELOPMENT RATE	NA	INITIAL WATER LEVEL (ft):	18.06



DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
0								0
								0
								0
								0
5								0
								0
								0
								0
								0
10								0
								0
								0
								0
								0
15							Light brown coarse to fine SAND, some Silt, little Clay	0
								0
								0
								0
								0
20								0
								0
								0
								0
								0
25								0
								0
								0
							Gray brown coarse to fine SAND, little Silt, trace coarse to fine Gravel	0
							Complete at 27.0± Feet	
30								
35								
40								

Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted. Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

APPENDIX C

Groundwater Monitoring Well Sampling Logs

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	Cottage Place, New Rochelle, NY			Job Number:	10491	WELL I.D. : MW-1			
Personnel:	JCS			Date:	5/15/2019				
				PID:	77.2				

Stickup? N / Distance ground to Stickup Rim/PVC	Distance From Rim to PVC	Total Depth of Well Rim/PVC	Depth to Product Rim/PVC	Depth to Water (Rim/PVC)	Standing Water Column (feet)	Middle of Saturated Zone (feet)	Depth to Sample Tube (feet)	TOV @ Well Head (ppmv)	Pump Peristaltic or Bladder
6"		23.5	NA	15.43	8.07	19.43'	19'	77.2	Bladder

Turbidity at collection (NTU):	139	(Less than 5 NTU is desirable)		Duplicate Collected? No		Filtered Sample	No
Stabilization Parameters	**+/- 0.5 deg C.**	**+/- 0.1 Unit**	**+/- 10 umhos/cm or within 3% if >300umho**	**1 ppm**	**+/- 10 mV**	**No Limit**	**<.3 feet drawdown desirable**	**No Limit**

Volume Purged (gallons)	Time (actual Time) 5 minute Intervals	TEMP. (Deg. C)	pH	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	1215	20.4	7.74	1.17	4.55	-20	163	15.87	N
	1220	19.6	7.71	1.21	3.21	-24	131	15.93	N
	1225	18.68	7.71	1.26	2.82	-19	142	15.97	N
	1230	18.52	7.7	1.28	2.74	-16	130	15.97	N
	1235	18.23	7.7	1.31	3.21	-3	139	15.97	N
	1240	18.21	7.7	1.32	3.25	3	155	15.98	N
	1245	18.1	7.7	1.32	3.31	7	155	15.98	N
	1250	17.91	7.71	1.33	3.49	10	150	15.98	N
	1255	17.8	7.71	1.33	3.51	14	151	16	N
	1300	17.77	7.72	1.35	3.52	18	147	16	N
	1305	17.66	7.71	1.35	3.6	22	155	16	N
	1310	17.6	7.71	1.37	3.65	29	144	16	N
	1315	17.53	7.71	1.37	3.71	31	152	16.03	N
	1320	17.41	7.71	1.4	3.84	35	145	16.03	N
	1325	17.33	7.71	1.4	3.9	36	135	16.03	N
4	1330	17.3	7.71	1.43	3.95	39	139	16.03	N

Well Condition Summary

Cover: Y	Bolts: Y		Concrete Pad OK: Y	Gripper: Y	

Sample Collection Information

Sample Time:	1340	Appearance: Clear	Filtered Sample Turbidity:	OTHER:

Desired purge flow rate <100mL/min (slow drip) & turbidity <10 if possible. If turbidity > 10 collect filtered and unfiltered samples. Notify PM of high turbidity and collection of filtered samples prior to lab submittal. Minimum 20 minute purge to establish stabilization.

Notes/ Calculations:

Volume? Linear Ft of well casing; 1"=0.041 gal. 2"= 0.163 gal. 4"=0.653 gal.

ABSORBENT SOCK

Sock Length (ft) =		Capacity (Qt.) =		Present:	Y / N	Product Measured (Inches) :
Sock Installation Date:			Sock Changed :		Y / N	
Sock Depth (Depth to sock mid point):						

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	Cottage place, New Rochelle, NY			Job Number:	10491	WELL I.D. : MW-2			
Personnel:	JCS			Date:	5/15/2019				
				PID:	54.8				

Stickup? No / Distance ground to Stickup Rim/PVC	Distance From Rim to PVC	Total Depth of Well Rim/PVC	Depth to Product Rim/PVC	Depth to Water (Rim/PVC)	Standing Water Column (feet)	Middle of Saturated Zone (feet)	Depth to Sample Tube (feet)	TOV @ Well Head (ppmv)	Pump Peristaltic or Bladder
		27	NA	18.83	8.17	22.91	22.50±		Bladder

Turbidity at collection (NTU):	47.3	(Less than 5 NTU is desirable)	Duplicate Collected? No		Filtered Sample	No

Stabilization Parameters	+/- 0.5 deg C.	+/- 0.1 Unit	+/- 10 umhos/cm or within 3% if >300umho	1 ppm	+/- 10 mV	No Limit	<.3 feet drawdown desirable	No Limit

Volume Purged (gallons)	Time (actual Time) 5 minute Intervals	TEMP. (Deg. C)	pH	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	945	15.79	8.77	0.622	4.15	-16	902	18.96	No
	950	15.65	7.85	0.617	2.46	-35	809	19.03	No
	955	15.33	7.64	0.612	1.81	-42	768	19.08	No
	1000	15.20	7.59	0.61	1.52	-44	697	19.10	No
	1005	15.25	7.58	0.618	1.30	-40	650	19.11	No
	1010	15.35	7.54	0.627	1.50	-34	603	19.11	No
	1015	15.31	7.55	0.636	1.07	-30	521	19.11	No
	1020	15.33	7.54	0.642	0.95	-28	472	19.12	No
	1025	15.28	7.54	0.648	0.87	-26	384	19.12	No
	1030	15.35	7.54	0.649	0.63	-25	331	19.12	No
	1035	15.20	7.54	0.652	0.74	-24	323	19.13	No
	1040	15.26	7.54	0.652	0.82	-22	250	19.13	No
	1045	15.28	7.55	0.652	0.75	-21	212	19.13	No
	1050	15.25	7.55	0.651	0.72	-21	177	19.13	No
	1055	15.20	7.56	0.651	0.70	-21	89.1	19.13	No
3	1100	15.26	7.56	0.65	0.68	-21	47.3	19.13	No

Well Condition Summary

Cover: Y / N	Bolts: Yes		Concrete Pad OK: Yes	Gripper: Yes	

Sample Collection Information

Sample Time:	1105	Appearance: Clear	Filtered Sample Turbidity:	OTHER:

Desired purge flow rate <100mL/min (slow drip) & turbidity <10 if possible. If turbidity > 10 collect filtered and unfiltered samples. Notify PM of high turbidity and collection of filtered samples prior to lab submittal. Minimum 20 minute purge to establish stabilization.

Notes/ Calculations:

Volume? Linear Ft of well casing; 1"=0.041 gal. 2"= 0.163 gal. 4"=0.653 gal.

ABSORBENT SOCK

Sock Length (ft) =		Capacity (Qt.) =		Present:	Y / N	Product Measured (Inches) :	
Sock Installation Date:			Sock Changed :		Y / N		
Sock Depth (Depth to sock mid point):							

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	Cottage place, New Rochelle, NY			Job Number:	10491	WELL I.D. : MW-3S			
Personnel:	JCS			Date:	5/17/2019	SESI CONSULTING ENGINEERS			
				PID:	198.2				
Stickup? No Distance ground to Stickup Rim/PVC	Distance From Rim to PVC	Total Depth of Well Rim/PVC	Depth to Product Rim/PVC	Depth to Water (Rim/PVC)	Standing Water Column (feet)	Middle of Saturated Zone (feet)	Depth to Sample Tube (feet)	TOV @ Well Head (ppmv)	Pump Peristaltic or Bladder
6"		26.5	NA	17.54	8.96	22.02	22.0±		Bladder
Turbidity at collection (NTU):			(Less than 5 NTU is desirable)		Duplicate Collected? No			Filtered Sample	No
Stabilization Parameters		+/- 0.5 deg C.	+/- 0.1 Unit	+/- 10 umhos/cm or within 3% if >300umho	1 ppm	+/- 10 mV	No Limit	<.3 feet drawdown desirable	No Limit

Volume Purged (gallons)	Time (actual Time) 5 minute Intervals	TEMP. (Deg. C)	pH	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	740	15.03	7.8	3.3	5.97	89	670	18	No
	745	15.17	7.55	3.52	2.51	59	604	18	No
	750	15.40	7.45	3.74	1.72	54	553	18.02	No
	755	15.57	7.43	3.81	1.42	52	527	18.02	No
	800	15.70	7.4	3.84	1.15	47	487	18.03	No
	805	15.78	7.38	3.84	0.94	44	430	18.03	No
	810	16.01	7.38	3.83	0.90	41	401	18.04	No
	815	16.13	7.38	3.84	0.70	38	372	18.04	No
	820	16.27	7.37	3.84	0.63	37	357	18.04	No
	825	16.40	7.36	3.82	0.55	36	331	18.05	No
	830	16.51	7.35	3.79	0.50	36	298	18.05	No
	835	16.67	7.35	3.79	0.42	35	224	18.05	No
	840	16.82	7.35	3.77	0.40	34	171	18.05	No
	845	17.00	7.35	3.74	0.45	33	133	18.05	No
	850	17.25	7.35	3.74	0.38	34	95.4	18.05	No
	855	17.21	7.33	3.71	0.37	32	67.2	18.05	No
3	900	17.26	7.33	3.71	0.36	32	48.9	18.05	No

Well Condition Summary

Cover: Yes	Bolts: Yes		Concrete Pad OK: Yes	Gripper: Yes	

Sample Collection Information

Sample Time:	910	Appearance: Clear	Filtered Sample Turbidity:	OTHER:

Desired purge flow rate <100mL/min (slow drip) & turbidity <10 if possible. If turbidity > 10 collect filtered and unfiltered samples. Notify PM of high turbidity and collection of filtered samples prior to lab submittal. Minimum 20 minute purge to establish stabilization.

Notes/ Calculations:

Volume? Linear Ft of well casing; 1"=0.041 gal. 2"= 0.163 gal. 4"=0.653 gal.

ABSORBENT SOCK

Sock Length (ft) =		Capacity (Qt.) =		Present:	Y / N	Product Measured (Inches) :
Sock Installation Date:			Sock Changed :		Y / N	
Sock Depth (Depth to sock mid point):						

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	Cottage place, New Rochelle, NY			Job Number:	10491	WELL I.D. : MW-3D			
Personnel:	JCS			Date:	5/16/2019	SESI CONSULTING ENGINEERS			
				PID:	27.6				
Stickup? Y/N Distance ground to Stickup Rim/PVC	Distance From Rim to PVC	Total Depth of Well Rim/PVC	Depth to Product Rim/PVC	Depth to Water (Rim/PVC)	Standing Water Column (feet)	Middle of Saturated Zone (feet)	Depth to Sample Tube (feet)	TOV @ Well Head (ppmv)	Pump Peristaltic or Bladder
6"		44.5	NA	18.2	26.3	31.35	39±		Bladder
Turbidity at collection (NTU):		48.6	(Less than 5 NTU is desirable)		Duplicate Collected? Y/N			Filtered Sample Y/N	
Stabilization Parameters		+/- 0.5 deg C.	+/- 0.1 Unit	+/- 10 umhos/cm or within 3% if >300umho	1 ppm	+/- 10 mV	No Limit	<.3 feet drawdown desirable	No Limit

Volume Purged (gallons)	Time (actual Time) 5 minute Intervals	TEMP. (Deg. C)	pH	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	1130	17.88	8.18	0.581	0	-228	65.8	27.91	No
	1135	18.01	8.17	0.583	0	-228	67.8	28.51	No
	1140	8.16	8.18	0.582	0	-226	63.5	29	No
	1145	18.27	8.18	0.582	0	-224	62.8	29.38	No
	1150	18.39	8.18	0.581	0	-226	62.2	30	No
	1155	18.45	8.18	0.578	0	-229	63.6	30.73	No
	1200	18.3	8.18	0.578	0	-232	64	31.35	No
	1205	18.11	8.19	0.573	0	-235	67.7	32.2	No
	1210	18.03	8.18	0.574	0	-237	68.1	32.87	No
	1215	17.9	8.19	0.573	0	-236	69.5	33.54	No
	1220	17.82	8.18	0.572	0	-237	68.2	33.98	No
	1225	17.73	8.18	0.573	0	-237	70.1	34.32	No
	1230	17.79	8.18	0.575	0	-239	68.3	34.9	No
	1235	17.85	8.18	0.575	0	-239	60.9	35.04	No
	1240	17.95	8.18	0.574	0	-240	57.3	35.29	No
	1245	17.98	8.18	0.574	0	-240	49.7	35.37	No
5	1250	18.02	8.18	0.575	0	-239	48.6	35.46	No

Well Condition Summary

Cover: Yes	Bolts: No		Concrete Pad OK: Yes	Gripper: Yes	

Sample Collection Information

Sample Time:	1300	Appearance: Clear	Filtered Sample Turbidity:	OTHER:

Desired purge flow rate <100mL/min (slow drip) & turbidity <10 if possible. If turbidity > 10 collect filtered and unfiltered samples. Notify PM of high turbidity and collection of filtered samples prior to lab submittal. Minimum 20 minute purge to establish stabilization.

Notes/ Calculations:

Volume? Linear Ft of well casing; 1"=0.041 gal. 2"= 0.163 gal. 4"=0.653 gal.

ABSORBENT SOCK

Sock Length (ft) =		Capacity (Qt.) =		Present:	Y / N	Product Measured (Inches) :	
Sock Installation Date:			Sock Changed :		Y / N		
Sock Depth (Depth to sock mid point):							

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	Cottage place, New Rochelle, NY			Job Number:	10491	WELL I.D. : MW-4			
Personnel:	JCS			Date:	5/16/2019	SESI CONSULTING ENGINEERS			
				PID:					
Stickup? No Distance ground to Stickup Rim/PVC	Distance From Rim to PVC	Total Depth of Well Rim/PVC	Depth to Product Rim/PVC	Depth to Water (Rim/PVC)	Standing Water Column (feet)	Middle of Saturated Zone (feet)	Depth to Sample Tube (feet)	TOV @ Well Head (ppmv)	Pump Peristaltic or Bladder
6"		25.5	NA	18.77	6.73	22.13	21±		Bladder
Turbidity at collection (NTU):		48.8	(Less than 5 NTU is desirable)		Duplicate Collected? Yes			Filtered Sample	No
Stabilization Parameters		+/- 0.5 deg C.	+/- 0.1 Unit	+/- 10 umhos/cm or within 3% if >300umho	1 ppm	+/- 10 mV	No Limit	<.3 feet drawdown desirable	No Limit

Volume Purged (gallons)	Time (actual Time) 5 minute Intervals	TEMP. (Deg. C)	pH	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	1435	17.49	8	1.65	10.05	110	428	18.92	No
	1440	16.36	7.97	1.66	7.58	111	253	19.08	No
	1445	16.37	7.94	1.65	7.14	113	179	19.16	No
	1450	17.53	7.93	1.67	6.6	116	121	19.17	No
	1455	17.7	7.94	1.69	6.52	116	94.5	19.18	No
	1500	17.42	7.96	1.68	6.52	117	78.4	19.18	No
	1505	17.33	7.98	1.72	6.52	117	62.5	19.18	No
2	1510	17.29	7.98	1.68	6.53	119	48.8	19.2	No

Well Condition Summary

Cover: Yes	Bolts: Yes		Concrete Pad OK: Yes	Gripper: Yes	

Sample Collection Information

Sample Time:	1520	Appearance: Clear	Filtered Sample Turbidity:	OTHER:

Desired purge flow rate <100mL/min (slow drip) & turbidity <10 if possible. If turbidity > 10 collect filtered and unfiltered samples. Notify PM of high turbidity and collection of filtered samples prior to lab submittal. Minimum 20 minute purge to establish stabilization.

Notes/ Calculations:

Volume? Linear Ft of well casing; 1"=0.041 gal. 2"= 0.163 gal. 4"=0.653 gal.

ABSORBENT SOCK

Sock Length (ft) =		Capacity (Qt.) =		Present:	Y / N	Product Measured (Inches) :	
Sock Installation Date:			Sock Changed :		Y / N		
Sock Depth (Depth to sock mid point):							

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	Cottage place, New Rochelle, NY			Job Number:	10491	WELL I.D. : MW-5			
Personnel:	JCS			Date:	5/16/2019				
				PID:	70.9				

Stickup? Yes / Distance ground to Stickup Rim/PVC	Distance From Rim to PVC	Total Depth of Well Rim/PVC	Depth to Product Rim/PVC	Depth to Water (Rim/PVC)	Standing Water Column (feet)	Middle of Saturated Zone (feet)	Depth to Sample Tube (feet)	TOV @ Well Head (ppmv)	Pump Peristaltic or Bladder
6"		27	NA	18.06	8.94	22.53	22±		Bladder

Turbidity at collection (NTU):		(Less than 5 NTU is desirable)		Duplicate Collected? No			Filtered Sample	No
Stabilization Parameters	**+/- 0.5 deg C.**	**+/- 0.1 Unit**	**+/- 10 umhos/cm or within 3% if >300umho**	**1 ppm**	**+/- 10 mV**	**No Limit**	**<.3 feet drawdown desirable**	**No Limit**

Volume Purged (gallons)	Time (actual Time) 5 minute Intervals	TEMP. (Deg. C)	pH	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	750	15.28	8.32	2.11	4.387	24	419	18.3	No
	755	14.84	8.24	2.15	1.45	-61	463	18.35	No
	800	14.68	8.24	2.18	0.86	-79	367	18.37	No
	805	14.69	8.22	2.2	0.51	-88	327	18.38	No
	810	14.67	8.17	2.2	0.36	-91	240	18.38	No
	815	14.71	8.14	2.17	0.32	-72	198	18.42	No
	820	14.77	8.11	2.16	0.28	-69	112	18.43	No
	825	14.8	8.09	2.14	0.24	-73	74.9	18.45	No
	830	14.82	8.07	2.13	0.21	-75	42.6	18.48	No

Well Condition Summary

Cover: Yes	Bolts: Yes		Concrete Pad OK: Yes	Gripper: Yes	

Sample Collection Information

Sample Time:	835	Appearance: Clear	Filtered Sample Turbidity:	OTHER:

Desired purge flow rate <100mL/min (slow drip) & turbidity <10 if possible. If turbidity > 10 collect filtered and unfiltered samples. Notify PM of high turbidity and collection of filtered samples prior to lab submittal. Minimum 20 minute purge to establish stabilization.

Notes/ Calculations:

Volume? Linear Ft of well casing; 1"=0.041 gal. 2"= 0.163 gal. 4"=0.653 gal.

ABSORBENT SOCK

Sock Length (ft) =		Capacity (Qt.) =		Present:	Y / N	Product Measured (Inches) :	
Sock Installation Date:			Sock Changed :		Y / N		
Sock Depth (Depth to sock mid point):							

APPENDIX D

Health and Safety Plan

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Cottage-Garden Auto Repair Site
30 Garden Street and 16 Cottage Place
New Rochelle, New York
(BCP# C360180)

Prepared For:

The Mark 95 LLC & The Mark 95 II LLC
1955 Central Park Avenue
Yonkers, New York 1071

Prepared By:

SESI CONSULTING ENGINEERS
12A Maple Avenue
Pine Brook, NJ 07058

Project No.: 10491

January 29, 2019

Disclaimer: *This Health and Safety Plan (HASP) is based upon information provided [and, if applicable, conditions discovered during a site visit], and is limited by the project scope.*

The HASP should be periodically reviewed and updated based on a number of factors, including but not limited to: (1) changes in applicable governmental requirements; (2) changes in procedures at the site; and (3) site conditions which were unknown to SESI Consulting Engineers (SESI) as of the time the HASP was prepared.

This HASP has been prepared for the sole and exclusive use of The Mark 95 LLC & The Mark 95 II LLC, and may not be relied upon by any other person without the express written consent and authorization of SESI.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

For

Cottage-Garden Auto Repair Site
30 Garden Street and 16 Cottage Place
New Rochelle, New York
(BCP# C360180)

Prepared by: _____ Date:

_____

Steven Gustems
SESI- Project Manager

Approved by: _____ Date:

_____

Fuad Dahan
SESI-Principal

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LIST OF ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
COC	Constituent(s) of Concern
CRZ	Contamination Reduction Zone
EZ	Exclusion Zone
FS	Field Supervisor
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
PO	Project Officer
PPE	Personal Protective Equipment
SESI	SESI Consulting Engineers
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
SZ	Support Zone
TLV	Threshold Limit Value
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

HEALTH AND SAFETY PLAN SUMMARY

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site Chemicals of Concern (COCs). COCs at the site include metals, some VOC compounds, some SVOC compounds and some pesticides. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate.

The following table summarizes airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Parameter	Reading	Action
Dust	0 to .5 mg/m3	Normal operations
	0.5 to 1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 1 mg/m3	Stop work, fully implement dust control plan
Oxygen	$\leq$ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	$\geq$ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to $\leq$ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the Field Supervisor and Site Safety Officer. The following table presents a selection matrix to determine appropriate Personal Protective Equipment.

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Mass Excavation, Drilling, Soil Grouting)	Modified Level D/Level C
Earthwork/Grading	Level D
Additional Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

1.0 INTRODUCTION

1.1 Objective

The objective of this Health and Safety Plan (HASP) is to provide a mechanism for establishing safe working conditions during activities at 30 Garden Street and 16 Cottage Place (also formerly known as 10 Cottage Place, and 25 and 26 Garden Street), New Rochelle, New York (the Site). The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of injury, illness, or other hazardous incident.

The HASP was written to meet the requirements of all applicable Federal, State, and local health and safety regulations, including 29 CFR 1910.120. The HASP is based on current knowledge regarding the specific chemical and physical hazards that are known or anticipated at the Site. This HASP is a dynamic document, for which changes and/or revisions may be realized as changes in scope and/or site conditions are encountered. Should revised documents be produced, said revised documents will refer to the specific changes and why they were made.

1.2 Site and Facility Description

The Site is located at 30 Cottage Place and 16 Garden Street in the City of New Rochelle, New York. The Site includes Tax Map/Parcels Numbers: 3-802-0032; 3-802-0036; and 3-802-0038. The Site acreage totals approximately 0.98-acres, which has been historically utilized for residential, commercial and manufacturing purposes.

The Site was formerly occupied by four commercial buildings and one residential building. All the buildings have been demolished down to their foundations. The residential parcel on 16 Cottage Place was a two and one-half story apartment building with approximately 1,000 sq. ft. of formerly occupied space. The residence was constructed as a residential single-family home in the early 1900's, with conversion to multiple apartments over the years, based on information from available records. The last business with an address of 10 – 12 Cottage Place was a retail tire and auto repair facility present on the Site for over 60 years. This portion of the Site was also once a gasoline station with underground tanks currently in place and prior uses are unknown. Commercial businesses were also present on the Site with prior addresses of 28 Garden Street and 34 Garden Street including a kitchen and bath dealer and other warehousing purposes. 26 Garden Street housed a Plastic Works manufacturing company called Strip-A-Way of New Rochelle Inc.

1.3 Policy Statement

The policy of SESI Consulting Engineers (SESI) is to provide a safe and healthful work environment. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety management is that all injuries, illnesses, and incidents are preventable. SESI will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or incident.

This HASP prescribes the procedures that must be followed by SESI personnel during activities at the site. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of

the Project Manager (PM) and the Health and Safety Manager (HSM). This document will be reviewed periodically by the HSM to ensure that it is current and technically correct. Any changes in site conditions and/or the scope of work will require a review and modification to this HASP. Such changes will be completed in the form of an addendum or a revision to the plan.

The provisions of this plan are mandatory for all SESI personnel and are advisory for all contractors, and subcontractors assigned to the project. ***Subcontractors will be responsible for preparing their own site-specific HASPs that meet the basic requirements outlined in this HASP.*** All visitors to SESI work areas at the site must abide by the requirements of this plan.

1.4 References

This HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, United States Environmental Protection Agency (USEPA) regulations, and SESI health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86116, October 1985).
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1910.
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (2004).
- *Threshold Limit Values*, ACGIH (2005).
- *Guide to Occupational Exposure Values*, ACGIH (2005).
- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).

1.5 Definitions

The following definitions (listed alphabetically) are applicable to this HASP:

- *Contamination Reduction Zone (CRZ)* - Area between the exclusion zone and support zone that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.
- *Exclusion Zone (EZ)* - Any portions of the site where hazardous substances are, or are reasonably suspected to be present, and pose an exposure hazard to on-site personnel.
- *Incident* - All losses, including first aid cases, injuries, illnesses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions.
- *On-Site Personnel* - All SESI and subcontractors involved with the project.
- *Project* - All on-site work performed under the scope of work.
- *Site* - The area described in Section 1.2, Site and Facility Description, where the work is to be performed by SESI personnel and subcontractors.
- *Support Zone (SZ)* - All areas of the site except the EZ and CRZ. The SZ surrounds the CRZ and EZ. Support equipment and break areas are located in this zone.
- *Subcontractor* - Includes contractor personnel hired by SESI.
- *Visitor* - All other personnel, except the on-site personnel.

- *Work Area* - The portion of the site where work activities are actively being performed. This area may change daily as work progresses and includes the SZ, CRZ, and EZ. If the work area is located in an area on the site that is not contaminated, or suspected of being contaminated, the entire work area may be a SZ.

2.0 PROJECT SCOPE OF WORK

This HASP contains information for the following tasks that SESI is anticipated to conduct at the Site. Should additional and/or different tasks be identified, amendments to this HASP will be required to address these changed items.

- Mobilization/Sample location stakeout;
- Soil Borings and Monitoring Well Installation;
- Excavation of contaminated soil “hot spots”;
- Earthwork and grading;
- Chemical sampling of soil and groundwater; and
- Decontamination and demobilization/site restoration.

3.0 ROLES AND RESPONSIBILITIES

3.1 All Personnel

All SESI project personnel must adhere to the procedures outlined in this HASP during the performance of their work. Each person is responsible for completing tasks safely and reporting any unsafe acts or conditions to their supervisor. No person may work in a manner that conflicts with these procedures. After due warnings, the PM will dismiss from the site any SESI employee or subcontractor who violates safety procedures.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all SESI personnel will attend an initial hazard briefing prior to beginning work at the site.

The roles of key safety personnel and subcontractors are outlined in the following sections. Key project personnel and contacts are summarized in Table 1.

3.2 Key Safety Personnel

3.2.1 Project Officer (PO)

The PO is responsible for providing resources to assure project activities are completed in accordance with this HASP, and for meeting all regulatory and contractual requirements.

3.2.2 Project Manager (PM)

The PM is responsible for verifying that project activities are completed in accordance with the requirements of this HASP. The PM is responsible for confirming that the Field Supervisor (FS) has the equipment, materials, and qualified personnel to fully implement the safety requirements of this HASP, and/or that subcontractors assigned to this project meet the requirements established by SESI. It is also the responsibility of the PM to:

- Consult with the HSM on site health and safety issues;

- Verify that subcontractors meet health and safety requirements prior to commencing work;
- Verify that all incidents are thoroughly investigated;
- Approve, in writing, addenda or modifications of this HASP; and
- Suspend work or modify work practices, as necessary, for personal safety, protection of property, and regulatory compliance.

3.2.3 Health and Safety Manager (HSM)

The HSM or his designee, the health and safety manager (HSM), has overall responsibility for the technical health and safety aspects of the project, including review and approval of this HASP. Inquiries regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The HSM or his designee must approve changes or addenda to this HASP.

3.2.4 Site Safety Officer (SSO)

The SSO is responsible for field health and safety issues, including the execution of this HASP. Questions in the field regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The SSO will advise the PM on health and safety issues and will establish and coordinate the project air-monitoring program if one is deemed necessary (see Section 5.1, Air Monitoring). The SSO is the primary site contact on health and safety matters. It is the responsibility of the SSO to:

- Provide on-site technical assistance, if necessary;
- Participate in all accident/incident reports and ensure that they are reported to the HSM, client, and PM within 24 hours;
- Coordinate site and personal air monitoring as required, including equipment maintenance and calibration;
- Conduct site safety orientation training and safety meetings;
- Verify that project personnel have received the required physical examinations and medical certifications;
- Review site activities with respect to compliance with this HASP;
- Maintain required health and safety documents and records; and
- Assist the FS in instructing field personnel on project hazards and protective procedures.

3.2.5 Field Supervisor (FS)

The FS is responsible for implementing this HASP, including communicating requirements to on-site personnel and subcontractors. The FS will be responsible for informing the PM of changes in the work plan, procedures, or site conditions so that those changes may be addressed in this HASP. Other responsibilities are to:

- Consult with the SSO on site health and safety issues;
- Stop work, as necessary, for personal safety, protection of property, and regulatory compliance;
- Obtain a site map and determine and post routes to medical facilities and emergency telephone numbers;

- Notify local public emergency representatives (as appropriate) of the nature of the site operations, and post their telephone numbers (i.e., local fire department personnel who would respond for a confined space rescue);
- Observe on-site project personnel for signs of ill health effects;
- Investigate and report any incidents to the SSO;
- Verify that all on-site personnel have had applicable training;
- Verify that on-site personnel are informed of the physical, chemical, and biological hazards associated with the site activities, and the procedures and protective equipment necessary to control the hazards; and
- Issue/obtain any required work permits (hot work, confined space, etc.).

3.2.6 Field Personnel (FP)

All SESI field personnel are responsible for following the Health and Safety procedures specified in this HASP and work practices specified in applicable operation procedures. Some specific responsibilities include, but are not limited to:

- Reading and understanding the HASP;
- Reporting all accidents, incidents, injuries, or illnesses to the FS;
- Complying with the requests of the SSO;
- Immediately communicating newly identified hazards or noncompliance issues to the FS or SSO; and
- Stopping work in cases of immediate danger.

3.3 Subcontractors

Subcontractors and their personnel must understand and comply with applicable regulations and site requirements established in this HASP. Subcontractors will prepare their own site-specific HASP that must be consistent with the requirements of this HASP.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the site. Additionally, on-site subcontractor personnel must conduct daily site safety meetings.

Subcontractors must designate individuals to function as the PM, HSM, SSO, and FS. In some firms the HSM to be carried out by the PM. This is acceptable provided the PM has the required knowledge, training, and experience to properly address all hazards associated with the work, and to prepare, approve, and oversee the execution of the site-specific HASP. A subcontractor may designate the same person to perform the duties of both the SSO and the FS. However, depending on the level of complexity of a contractor's scope of work, it may be infeasible for one person to perform both functions satisfactorily.

3.4 Stop Work Authority

Every SESI employee and subcontractor is empowered, expected, and has the responsibility to stop the work of another co-worker if the working conditions or behaviors are considered unsafe.

3.5 All On-Site Personnel

All on-site SESI personnel (including SESI subcontractors) must read and acknowledge their understanding of their respective HASPs before commencing work and abide by the requirements of the plans. All on-site SESI personnel shall sign their HASP Acknowledgement Form following their review of their HASP.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all on-site personnel will attend an initial hazard briefing provided by the SSO prior to beginning work at the site and conduct daily safety meetings thereafter.

On-site personnel will immediately report the following to the FS or SSO:

- Personal injuries and illnesses no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or hazardous situations;
- Unsafe or malfunctioning equipment;
- Changes in site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and
- Situations or activities for which they are not properly trained.

3.6 Visitors

All SESI personnel and subcontractors visiting the Site must check in with the FS. Visitors will be cautioned to avoid skin contact with surfaces, soils, groundwater, or other materials that may impacted or be suspected to be impacted by constituents of concern (COCs).

Visitors requesting to observe work at the site must don appropriate personal protective equipment (PPE) prior to entry to the work area and must have the appropriate training and medical clearances to do so. If respiratory protective devices are necessary, visitors who wish to enter the work area must have been respirator-trained and fit tested for a respirator within the past 12 months.

Table 1 – Key Safety Personnel

SESI Personnel		
Role	**Name**	**Address/Telephone No.**
Project Officer (PO)	TBD	
Project Manager (PM)	TBD	
Senior Project Engineer (SPE)	TBD	
Health and Safety Manager (HSM)	TBD	
Site Safety Officer (SSO)	TBD	
Field Supervisor (FS)	TBD	
Field Personnel	TBD	
Field Personnel	TBD	
Subcontractors		
Company/Role	**Name**	**Address/Telephone No.**
TBD	TBD	TBD

4.0 PERSONAL PROTECTIVE EQUIPMENT

4.1 Levels of Protection

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the levels of COCs and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level. A summary of the levels is presented in Table 2 in this section.

4.1.1 Level D Protection

The minimum level of protection that will be required of project personnel at the site will be Level D, which will be worn when site conditions or air monitoring indicates no inhalation hazard exists. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting American National Standards Institute (ANSI) Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Leather work gloves and/or nitrile surgical gloves;
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.1.2 Modified Level D Protection

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities present an increased potential for skin contact with contaminated materials. Modified Level D consists of:

- Nitrile gloves worn over nitrile surgical gloves;
- Latex/polyvinyl chloride (PVC) overboots when contact with COC-impacted media is anticipated;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Face shield in addition to safety glasses or goggles when projectiles or splash hazards exist (e.g. during Power Washing activities);
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used);
- Tyvek® suit (polyethylene coated Tyvek® suits for handling liquids) when body contact with COC-impacted media is anticipated; and
- PFD if working on or near the water.

4.1.3 Level C Protection

Level C protection will be required when the airborne concentration of COC reaches one-half of the OSHA Permissible Exposure Limit or ACGIH TLV. The following equipment will be used for Level C protection:

- Full-face, air-purifying respirator with combination organic vapor/HEPA cartridges;
- Polyethylene-coated Tyvek® suit, with ankles and cuffs taped to boots and gloves;
- Nitrile gloves worn over nitrile surgical gloves;

- Steel toe work boots, meeting ANSI Z41;
- Chemical-resistant boots with steel toes or latex/PVC overboots over steel toe boots;
- Hard hat, meeting ANSI Z89;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.2 Selection of PPE

Equipment for personal protection will be selected based on the potential for contact, site conditions, ambient air quality, and the judgment of supervising site personnel and health and safety professionals. The PPE used will be chosen to be effective against the COCs present on the site.

4.3 Site Respiratory Protection Program

Respiratory protection is an integral part of employee health and safety at the site due to potentially hazardous concentrations of airborne COCs. The site respiratory protection program will consist of the following (as a minimum):

- All on-site personnel who may use respiratory protection will have an assigned respirator.
- All on-site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months. Documentation of the fit test must be provided to the SSO prior to commencement of work.
- All on-site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the SSO, prior to commencement of site work.
- Only cleaned, maintained, NIOSH-approved respirators will be used.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is worn.
- All on-site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.
- After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

4.4 Using PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in accordance with the requirements of this HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed, to minimize the spread of COCs.

4.4.1 Donning Procedures

These procedures are mandatory only if Modified Level D or Level C PPE is used on the site:

- Remove bulky outerwear. Remove street clothes and store in clean location;
- Put on work clothes or coveralls;
- Put on the required chemical protective coveralls;
- Put on the required chemical protective boots or boot covers;
- Tape the legs of the coveralls to the boots with duct tape;
- Put on the required chemical protective gloves;
- Tape the wrists of the protective coveralls to the gloves;
- Don the required respirator and perform appropriate fit check (Level C);
- Put hood or head covering over-head and respirator straps and tape hood to facepiece (Level C); and
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

4.4.2 Doffing Procedures

The following procedures are only mandatory if Modified Level D or Level C PPE is required for the site. Whenever a person leaves the work area, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face, and neck (or shower if necessary);
- Proceed to clean area and dress in clean clothing; and
- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 7, Decontamination, for detailed information on decontamination stations.

4.5 Selection Matrix

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the FS and SSO of the potential for skin contact with COCs. The PPE selection matrix is presented in Table 2. This matrix is based on information available at the time this plan was written. The Airborne Contaminant Action Levels in Table 3, Airborne Contaminant Action Levels, should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 2 – PPE Selection Matrix

Task	Anticipated Level of Protection
Mobilization	Level D

Subsurface Intrusive Activities (Excavation, Drilling)	Modified Level D/Level C
Earthwork/Grading	Level D
Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

5.0 AIR AND NOISE MONITORING

5.1 Air Monitoring

Air monitoring, sampling, and testing will be conducted to determine employee exposure to airborne constituents. The monitoring results will dictate work procedures and the selection of PPE. The SESI SSO will be responsible for defining appropriate air monitoring procedures and for utilizing the air monitoring results to determine appropriate procedures and PPE for project personnel. Air monitoring results should be recorded in field notebooks or on an air monitoring log (see Attachment 1 for a copy of the Air Monitoring Log). Any deviations from the procedures listed here should be documented and explained in the Air Monitoring Log.

The monitoring devices to be used are a PDR1000 particulate monitor (or equivalent) and a Rae Systems MultiRAE detector (PID with a 11.7 eV lamp/oxygen/LEL/hydrogen sulfide sensors). Colorimetric detector tubes may be utilized to estimate airborne concentrations of benzene and should be onsite during any activities that may result in elevated PID readings including drilling, excavating, and groundwater sampling.

Air monitoring will be conducted continuously with the LEL/Oxygen meter during drilling in areas where flammable vapors or gases are suspect. All work activity must stop where tests indicate the concentration of flammable vapors exceeds 10% of the LEL at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

5.2 Noise Monitoring

Noise monitoring may be conducted as required. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

5.3 Monitoring Equipment Maintenance and Calibration

All direct-reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the SSO and maintained by the FS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturer's procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturer's procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the SSO must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The SSO will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

5.4 Action Levels

Table 3 presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Table 3 – Airborne Contaminant Action Levels

Parameter	Reading	Action
Total Hydrocarbons	0 ppm to ≤ 1 ppm	Normal operations; continue hourly breathing zone monitoring
	> 1 ppm to 5 ppm	Increase monitoring frequency to every 15 minutes and use benzene detector tube to screen for the presence of benzene
	≥ 5 ppm to ≤ 50 ppm	Upgrade to Level C PPE; continue screening for benzene
	> 50 ppm	Stop work; investigate cause of reading
	At any reading > 5 ppm	Monitor perimeter per CAMP
Benzene	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> 5 ppm	Stop work; investigate cause of reading
Dust	0 to .05 mg/m3	Normal operations
	0.05 to 0.1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 0.15 mg/m3	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Hydrogen Sulfide	0 ppm to ≤ 5 ppm	Normal operations
	> 5 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Flammable Vapors (LEL)	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work, ventilate area, investigate source of vapors

6.0 WORK ZONES AND DECONTAMINATION

6.1 Work Zones

6.1.1 Authorization to Enter

Only personnel with the appropriate training and medical certifications (if respirators are required) will be allowed to work at the project site. The FS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed to enter the site work areas.

6.1.2 Site Orientation and Hazard Briefing

No person will be allowed in the work area during site operations without first being given a site orientation and hazard briefing. This orientation will be presented by the FS or SSO and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. Following this initial meeting, daily safety meetings will be held each day before work begins.

All people entering the site work areas, including visitors, must document their attendance at this briefing, as well as the daily safety meetings on the forms included with this plan.

6.1.3 Certification Documents

A training and medical file may be established for the project and kept on site during all site operations. Specialty training, such as first aid/cardiopulmonary resuscitation (CPR) certificates, as well as current medical clearances for all project field personnel required to wear respirators, will be maintained within that file. All project personnel must provide their training and medical documentation to the SSO prior to starting work.

6.1.4 Entry Log

A log-in/log-out sheet will be maintained at the site by the FS. Personnel must sign in and out on a log sheet as they enter and leave the work area, and the FS may document entry and exit in the field notebook.

6.1.5 Entry Requirements

In addition to the authorization, hazard briefing, and certification requirements listed above, no person will be allowed in any SESI work area unless they are wearing the minimum PPE as described in Section 4.0.

6.1.6 Emergency Entry and Exit

People who must enter the work area on an emergency basis will be briefed of the hazards by the FS or SSO. All activities will cease in the event of an emergency. People exiting the work area because of an emergency will gather in a designated safe area for a head count. The FS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

6.1.7 Contamination Control Zones

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

6.1.8 Exclusion Zone (EZ)

An EZ may consist of a specific work area or may be the entire area of potential contamination. All employees entering an EZ must use the required PPE and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a posted site diagram will identify the location of each EZ.

6.1.9 Contamination Reduction Zone

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the support zone (SZ) discussed below.

6.1.10 Support Zone (SZ)

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to site requirements.

6.1.11 Posting

Work areas will be prominently marked and delineated using cones, caution tape, or a posted site diagram.

6.1.12 Site Inspections

The FS will conduct a daily inspection of site activities, equipment, and procedures to verify that the required elements are in place.

6.2 Decontamination

6.2.1 Personnel Decontamination

All personnel wearing Modified Level D or Level C protective equipment in the EZ must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations at a minimum:

- *Station 1*: Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.
- *Station 2*: Personnel will remove their outer garment and gloves and dispose of it in properly labeled containers. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.
- *Station 3*: Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

6.2.2 Equipment Decontamination

All vehicles that have entered the EZ will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly

contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

6.2.3 Personal Protective Equipment Decontamination

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the site with detergent and water. The rinsate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water (mixed at 2% bleach by volume), or by using a spray disinfectant.

7.0 TRAINING AND MEDICAL SURVEILLANCE

7.1 Training

7.1.1 General

All on-site project personnel who work in areas where they may be exposed to site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). Field employees also must receive a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their initial training more than 12 months prior to the start of the project must have completed an eight-hour refresher course within the past 12 months. The FS must have completed an additional eight hours of supervisory training and must have a current first-aid/CPR certificate (See Attachment 2).

7.1.2 Basic 40-Hour Course

The following is a list of the topics typically covered in a 40-hour HAZWOPER training course:

- General safety procedures;
- Physical hazards (fall protection, noise, heat stress, cold stress);
- Names and job descriptions of key personnel responsible for site health and safety;
- Safety, health, and other hazards typically present at hazardous waste sites;
- Use, application, and limitations of PPE;
- Work practices by which employees can minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements;
- Recognition of symptoms and signs which might indicate overexposure to hazards;
- Worker right-to-know (Hazard Communication OSHA 1910.1200);
- Routes of exposure to contaminants;
- Engineering controls and safe work practices;
- Components of a health and safety program and a site-specific HASP;
- Decontamination practices for personnel and equipment;
- Confined-space entry procedures; and

- General emergency response procedures.

7.1.3 Supervisor Course

Management and supervisors must receive an additional eight hours of training, which typically includes:

- General site safety and health procedures;
- PPE programs; and
- Air monitoring techniques.

7.1.4 Site-Specific Training

Site-specific training will be accomplished by on-site personnel reading this HASP, and through a thorough site briefing by the PM, FS, or SSO on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards; the protective equipment and safety procedures; and emergency procedures.

7.1.5 Daily Safety Meetings

Daily safety meetings will be held to cover the work to be accomplished, the hazards anticipated, the PPE and procedures required to minimize site hazards, and emergency procedures. The FS or SSO should present these meetings prior to beginning the day's fieldwork. No work will be performed in an EZ before a daily safety meeting has been held. An additional safety meeting must also be held prior to new tasks, or if new hazards are encountered. The daily safety meetings will be logged in the field notebook.

7.1.6 First Aid and CPR

At least one employee current in first aid/CPR will be assigned to the work crew and will be on the site during operations. Site records will document the presence of this individual. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

7.2 Medical Surveillance

7.2.1 Medical Examination

All personnel who are potentially exposed to site contaminants must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

7.2.2 Pre-placement Medical Examination

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable regulations. The pre-placement and periodic medical examinations typically include the following elements:

- Medical and occupational history questionnaire;
- Physical examination;
- Complete blood count, with differential;
- Liver enzyme profile;
- Chest X-ray, at a frequency determined by the physician;
- Pulmonary function test;

- Audiogram;
- Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- Drug and alcohol screening, as required by job assignment;
- Visual acuity; and
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

7.2.3 Other Medical Examinations

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials; and
- At the discretion of the SSO, HSM, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials.

7.2.4 Periodic Exam

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 24 months.

7.2.5 Medical Restriction

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the SSO. The terms of the restriction will be discussed with the employee and the supervisor.

8.0 GENERAL SAFETY PRACTICES

8.1 General Safety Rules

General safety rules for site activities include, but are not limited to, the following:

- At least one copy of this HASP must be in a location at the site that is readily available to personnel, and all project personnel shall review the plan prior to starting work.

- Consume or use food, beverages, chewing gum, and tobacco products only in the SZ or other designated area outside the EZ and CRZ. Cosmetics shall not be applied in the EZ or CRZ.
- Wash hands before eating, drinking, smoking, or using toilet facilities.
- Wear all PPE as required and stop work and replace damaged PPE immediately.
- Secure disposable coveralls, boots, and gloves at the wrists and legs and ensure closure of the suit around the neck.
- Upon skin contact with materials that may be impacted by COCs, remove contaminated clothing and wash the affected area immediately. Contaminated clothing must be changed. Any skin contact with materials potentially impacted by COCs must be reported to the FS or SSO immediately. If needed, medical attention should be sought.
- Practice contamination avoidance. Avoid contact with surfaces either suspected or known to be impacted by COCs, such as standing water, mud, or discolored soil. Equipment must be stored on elevated or protected surfaces to reduce the potential for incidental contamination.
- Remove PPE as required in the CRZ to limit the spread of COC-containing materials.
- At the end of each shift or as required, dispose of all single-use coveralls, soiled gloves, and respirator cartridges in designated receptacles designated for this purpose.
- Removing soil containing site COCs from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited.
- Inspect all non-disposable PPE for contamination in the CRZ. Any PPE found to be contaminated must be decontaminated or disposed of appropriately.
- Recognize emergency signals used for evacuation, injury, fire, etc.
- Report all injuries, illnesses, and unsafe conditions or work practices to the FS or SSO.
- Use the “buddy system” during all operations requiring Level C PPE, and when appropriate, during Modified Level D operations.
- Obey all warning signs, tags, and barriers. Do not remove any warnings unless authorized to do so.
- Use, adjust, alter, and repair equipment only if trained and authorized to do so, and in accordance with the manufacturer’s directions.
- Personnel are to perform only tasks for which they have been properly trained and will advise their supervisor if they have been assigned a task for which they are not trained.
- The presence or consumption of alcoholic beverages or illicit drugs during the workday, including breaks, is strictly prohibited. Notify your supervisor if you must take prescription or over-the-counter drugs that indicate they may cause drowsiness or, that you should not operate heavy equipment.
- Remain upwind during site activities whenever possible.

8.2 Buddy System

On-site personnel must use the buddy system as required by operations. Use of the “buddy system” is required during all operations requiring Level C to Level A PPE, and when appropriate, during Level D operations. Crewmembers must observe each other for

signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration;
- Changes in coordination;
- Changes in demeanor;
- Excessive salivation and pupillary response; and
- Changes in speech pattern.

Crewmembers must also be aware of the potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.

Field personnel must inform their partners or fellow crewmembers of non-visible effects of exposure to toxic materials that they may be experiencing. The symptoms of such exposure may include, but are not limited to:

- Headaches;
- Dizziness;
- Nausea;
- Blurred vision;
- Cramps; and
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

8.3 Heat Stress

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the

water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

8.4 Heat Stress Safety Precautions

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in Table 4.

Table 4 – Work/Rest Schedule

Adjusted Temperature[b]	Work/Rest Regimen Normal Work Ensemble[c]	Work/Rest Regimen Impermeable Ensemble
90ºF (32.2ºC) or above	After each 45 minutes of work	After each 15 minutes of work
87.5º - 90ºF (30.8º-32.2ºC)	After each 60 minutes of work	After each 30 minutes of work
82.5º - 87.5ºF (28.1º - 30.8ºC)	After each 90 minutes of work	After each 60 minutes of work
77.5º - 82.5ºF (25.3º - 28.1ºC)	After each 120 minutes of work	After each 90 minutes of work
72.5º - 77.5ºF (30.8º - 32.2ºC)	After each 150 minutes of work	After each 120 minutes of work

a. For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)
b. Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)
c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.
d. The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.

- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

8.5 Cold Stress

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at 18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in Table 5.

Table 5 – Wind Chill Temperature Chart

Estimated Wind Speed (in mph)	**Actual Temperature Reading (ºF)**											
	50	**40**	**30**	**20**	**10**	**0**	**-10**	**-20**	**-30**	**-40**	**-50**	**-60**
	Equivalent Chill Temperature (ºF)											
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
(Wind speeds greater than 40 mph have little additional effect.)	**LITTLE DANGER Maximum danger of false sense of security.**				**INCREASING DANGER Danger from freezing of exposed flesh within one minute.**			**GREAT DANGER Flesh may freeze within 30 seconds.**				
	Trench foot and immersion foot may occur at any point on this chart.											

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- *Frost Nip or Incipient Frostbite* - characterized by sudden blanching or whitening of skin.
- *Superficial Frostbite* - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- *Deep Frostbite* - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the

extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

8.6 Safety Precautions for Cold Stress Prevention

For air temperature of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. Wet field personnel must change into dry clothes prior to entering the cold area.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

8.7 Safe Work Practices

Direct contact between bare skin and cold surfaces (< 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing. Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

8.8 Biological Hazards

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, spiders, and other pests.

8.8.1 Tick Borne Diseases

Lyme Disease - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

Erlichiosis - The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. "Hot spots" in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull's eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, and swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (Rickettsia rickettsii) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

Control - Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

8.8.2 Poisonous Plants

Poisonous plants may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination

avoidance. If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

8.8.3 Snakes

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control - To minimize the threat of snakebites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snakebite occurs, an attempt should be made to safely identify the snake via size and markings. The victim must be transported to the nearest hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

8.8.4 Spiders

Personnel may encounter spiders during work activities.

Two spiders are of concern, the black widow and the brown recluse. Both prefer dark sheltered areas such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately one inch long, and found throughout the United States. There is a distinctive red hourglass marking on the underside of the black widows body. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. The brown recluse is more prevalent in the southern United States. The brown recluse has a distinctive violin shape on the top of its body. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

Control - To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs, and placing hands in dark places such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

8.9 Noise

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control - All personnel must wear hearing protection, with a Noise Reduction Rating (NRR) of at least 20, when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 5.2, Noise Monitoring.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

8.10 Spill Control

All personnel must take every precaution to minimize the potential for spills during site operations. All on-site personnel shall immediately report any discharge, no matter how small, to the FS.

Spill control equipment and materials will be located on the site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the FS will follow the provisions in Section 10.0, Emergency Procedures, to contain and control released materials and to prevent their spread to off-site areas.

8.11 Sanitation

Site sanitation will be maintained according to OSHA requirements.

8.11.1 Break Area

Breaks must be taken in the SZ, away from the active work area after site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

8.11.2 Potable Water

The following rules apply to all field operations:

- An adequate supply of potable water will be provided at each project site. Potable water must be kept away from hazardous materials or media, and contaminated clothing or equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.
- Containers used for drinking water must be clearly marked and shall not be used for any other purpose.
- Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

8.11.3 Sanitary Facilities

Access to facilities for washing before eating, drinking, or smoking, or alternate methods such as waterless hand-cleaner and paper towels will be provided.

8.11.4 Lavatory

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided. This requirement does not apply to mobile crews or to normally unattended site locations so long as employees at these locations have transportation immediately available to nearby toilet facilities.

8.12 Emergency Equipment

Adequate emergency equipment for the activities being conducted on site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926 will be on site prior to the commencement of project activities. Personnel will be provided with access to emergency equipment, including, but not limited to, the following:

- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 1926;
- Industrial first aid kits of adequate size for the number of personnel on site; and
- Emergency eyewash and/or shower if required by operations being conducted on site.

8.13 Lockout/Tagout Procedures

Only fully qualified and trained personnel will perform maintenance procedures. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means, such as lock, to hold an energy or material-isolating device such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system shall be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controls may not be operated until the personnel who attached the tag remove the tag.

8.14 Electrical Safety

Electricity may pose a particular hazard to site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by Underwriters Laboratories (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.
- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or USCG regulations.
- Portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.

- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.
- Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension cord outlets must be equipped with ground fault circuit interrupters (GFCI).
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

8.15 Lifting Safety

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

8.16 Ladder Safety

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least 3 feet (9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting

and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.
- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces, including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.
- The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
- The top, top step, or the step labeled that it or any step above it should not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- Ladders shall be inspected by the HSM for visible defects on a daily basis and after any occurrence that could affect their safe use.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; corroded components; or other faulty or defective components shall either be immediately marked in a manner that readily identifies them as defective or be tagged with "Do Not Use" or similar language and shall be withdrawn from service.
- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; or corroded components; shall be withdrawn from service.
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- Single-rail ladders shall not be used.

- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

8.17 Traffic Safety

The project site may be located adjacent to a public roadway where exposure to vehicular traffic is likely. Traffic may also be encountered as vehicles enter and exit the area. To minimize the likelihood of project personnel and activities being affected by traffic, the following procedures will be implemented.

Cones must be placed along the shoulder of the roadway starting 100 feet from the work area to alert passing motorists to the presence of personnel and equipment. A "Slow" or "Men Working" sign must be placed at the first cone. Barricades with flashing lights should be placed between the roadway and the work area.

During activities along a roadway, equipment will be aligned parallel to the roadway to the extent feasible, facing into the oncoming traffic so as to place a barrier between the work crew and the oncoming traffic. All crewmembers must remain behind the equipment and the traffic barrier.

All site personnel who are potentially exposed to vehicular traffic must wear an outer layer of orange warning garments, such as vests, jackets, or shirts. If work is performed in hours of dusk or darkness, workers will be outfitted with reflective garments either orange, white (including silver-coated reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.

The flow of traffic into and out of the adjacent business must be assessed, and precautions taken to warn motorists of the presence of workers and equipment. Where possible, vehicles should be aligned to provide physical protection of people and equipment.

9.0 SITE-SPECIFIC HAZARDS AND CONTROL MEASURES

9.1 Evaluation of Hazards

The evaluation of hazards is provided as a quick reference as to the known conditions for the Site, wherein the level of detail for each of the subsections is identified.

9.1.1 Hazard Characteristics

Existing information for Site:
__X__ Detailed _____ Preliminary _____ None

Hazardous/Contaminated Material Form(s):
__X__ Solid __X__ Liquid _____ Sludge ___ Gas X Vapor

Containment Type(s):
_____ Drum __X__ Tank _____ Pit _____ Debris
_____ Pond _____ Lagoon Other:

Hazardous Material Characteristics:

X Volatile	____ Corrosive	____ Reactive	____ Radioactive
____ Ignitable	X Toxic	X Unknown	

Routes of Exposure:

X Oral	X Dermal	X Eye	X Respiratory

9.1.2 Potential Health and Safety Hazards

X Heat	____ Congested areas
X Cold	X General Construction
____ Confined space entry	X Physical injury
____ Oxygen depletion	X Electrical hazards
____ Asphyxiation	X Handling and product transfer
X Excavation	X Fire
X Cave-ins	X Explosion
X Falls, slippage	X Biological Hazards
	X Plants – Poison Ivy, Poison Oak
	X Insects – Ticks
	X Insects – Mosquitoes
	X Insects – Bees and Wasps
	X Rats and Mice
X Heavy equipment	____ Non-ionizing Radiation (i.e. UV, IR, etc.)
____ Other: Potential Ignition Hazard.	

9.2 Field Activities, Hazards, and Control Procedures

The following task-specific safety analyses identify potential health, safety, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the site to identify hazards that may affect on-site personnel, the community, or the environment. The FS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The FS will keep on-site personnel informed of the changing conditions, and the PM will write and/or approve addenda or revisions to this HASP as necessary.

9.2.1 Mobilization/Construction Stakeout

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The hazards of this phase of activity are associated with heavy equipment operation, manual materials handling, installation of temporary on-site facilities, and manual site preparation.

Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Installation of temporary field office and support facilities may expose personnel to electrical hazards, underground and overhead utilities, and physical injury due to the manual lifting and moving of materials. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Controls
Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.2.2 Demolition/Site Clearing

Description of Tasks
Site clearance will involve manual or mechanical removal of objects impeding access to the construction footprint. These obstructions are both natural and man-made items and will include, but not be limited to, fabricated metal and concrete structures, trees, vegetation, rubble, and miscellaneous trash/debris.

Hazard Identification
Hazards associated with demolition and site clearance include personnel working in and around potentially unstable structures, or locations of potential contact with hazardous chemicals, utilities, and/or falling objects. This task will involve manual, as well as mechanical demolition/clearance efforts so exertion and equipment hazards exist.

Controls
PPE – Personnel shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

Preparatory Operations – Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a licensed Professional Engineer, of the structure to determine the stability of the structure. Any adjacent structure shall where personnel may be exposed shall also be similarly checked. The PO shall have in writing evidence that such a survey has been performed. All structural instabilities shall be shored or braced, under the supervision of a licensed Professional Engineer, prior to access by an FP.

Utilities – All electric, gas, water, steam, sewer, and other service lines shall be shut off, caped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company that is involved shall be notified in advance. If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary.

Hazardous Substances – It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used

in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Falling Debris/Objects – No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effective protected. Access to the area where falling objects/debris may be encountered must be gated and controlled.

Structural Collapse – Structural or load supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. Walls, which are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load. Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are not of sufficient strength to support the imposed load.

Rollover Guards – All equipment used in site clearing operations shall be equipped with rollover guards meeting the applicable requirements. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the applicable requirements.

Inspections – During demolition, continuing inspections by a licensed Professional Engineer shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No FP shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

9.2.3 Excavation and Cut/Fill Operations

9.2.3.1 Excavation/Trenching

Description of Tasks

This task includes the excavation of contaminated soils and superficial debris. Excavation depths vary across the site.

Hazard Identification

The hazards of this activity are associated with heavy equipment operation, subsurface intrusion, manual materials handling, stockpiling, and disposal. Subsurface intrusion presents hazards associated with negotiating buried utilities, cave-ins of the excavated areas, and regress methods for personnel working inside the excavated areas. Disruption of contaminated soil also presents a health hazard.

Controls

Underground Utilities – The estimated locations of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during the excavation work, shall be determined prior to opening an excavation. Utility companies or owners shall be contacted (“Call Before You Dig”) within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by save and acceptable means.

While the excavation is open, underground installations shall be protected, supported, or removed, as necessary, to safeguard site personnel.

Cave-Ins – Project personnel in an excavation shall be protected from cave-ins by an adequate protective system, except when:

- Excavations are made entirely in stable rock or excavations are less than five feet in depth and examination of the ground by the SSO provides no indication of a potential cave-in.
- Protective systems shall have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

Project personnel shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by the SSO for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the SSO prior to the start of work and as needed throughout operations. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when project personnel exposure can be reasonably anticipated.

Where the SSO finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed personnel shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Excavation Egress – A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet or lateral travel for project personnel.

9.2.3.2 Heavy Equipment Operation

Description of Tasks

Heavy equipment to be used for this task include, but are not limited to, excavators, dozers, dump trucks, and water sprayers (if required).

Hazard Identification

The most common type of accident that occurs in material handling operations is the “caught between” situation when a load is being handled and an object gets caught between two moving parts of the equipment. Operation of the heavy construction equipment may produce harmful noise.

Controls

Equipment Inspection – All vehicles in use shall be checked prior to operation to ensure that all parts, equipment, and accessories that affect safe operations are in proper

operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service.

Ground Guides – No personnel shall use any motor vehicle, earthmoving, or compacting equipment having an obstructed view to the rear, unless:

- The vehicle has a reverse signal alarm distinguishable from the surrounding noise level; or
- The vehicle is backed up only when an observer signals that it is safe to do so.

Blocking – Heavy machinery, equipment, or parts thereof that are suspended or held aloft shall be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

Noise – Control measures for noise are addressed in Section 4.9.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.3.3 Disturbance/Handling of Contaminated Material

Description of Tasks

After the contaminated soil is excavated from below the Site's surface, the material will be stockpiled, dried, and either transported offsite or relocated and backfilled on site.

Hazard Identification

The hazards associated with materials handling include contact of the contaminated material with project personnel, or cross contamination with other site soil.

Controls

Cross Contamination – Following excavation, contaminated soil stockpiles will be placed on a structure constructed to separate the material from the site soil and collect any groundwater leachate. The material shall be covered to prevent storm water erosion or migration of contaminants through storm water.

Air Monitoring – Air and particulate monitoring will be conducted during soil excavation activities to assess the potential for exposure to airborne COCs. If the results of air monitoring indicate the presence of organic vapors or particulates in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.4 Drilling/Subsurface Intrusion Activities

Description of Tasks

This component of work includes the project tasks of delineation and sampling the PCB–impacted soil, installation of the groundwater cutoff wall, and in-situ soil grouting. Geotechnical testing of the grout and existing site soils will also be conducted.

Hazard Identification

The primary physical hazards for this activity are associated with the use of soil boring and grouting equipment. The equipment is hydraulically powered and uses static force and dynamic percussion force to advance sampling and penetrating tubes.

Accidents can occur as a result of improperly placing the equipment on uneven or unstable terrain or failing to adequately secure the equipment prior to the start of operations. Overhead utility lines can create hazardous conditions if contacted by the equipment. Underground installations such as electrical lines, conduit, and product lines pose a significant hazard if contacted.

Controls

Geoprobe and Drill Rig Safety Procedures - The operator of the equipment must possess required state or local licenses to perform such work. All members of the crew shall receive site-specific training prior to beginning work.

The operator is responsible for the safe operation of the rig, as well as the crew's adherence to the requirements of this HASP. The operator must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the operator, wear all personal protective equipment, and be aware of all hazards and control procedures. The operator and crew must participate in the Daily Safety Meetings and be aware of all emergency procedures.

Equipment Inspection - Each day, prior to the start of work, the rig and associated equipment must be inspected by the operator. The following items must be inspected:

- Vehicle condition;
- Proper storage of equipment;
- Condition of all hydraulic lines;
- Fire extinguisher; and
- First aid kit.

Equipment Set Up - The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels which remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

All well sites will be inspected by the driller prior to the location of the rig to verify a stable surface exists. This is especially important in areas where soft, unstable terrain is common.

The drill rig must be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur.

When the ground surface is soft or otherwise unstable, wooden blocks, at least 24" by 24" and 4" to 8" thick shall be placed between the jack swivels and the ground. The emergency brake shall be engaged, and the wheels that are on the ground shall be chocked.

Rules for Intrusive Activity - Before beginning any intrusive activity, the existence and location of underground pipe, conduit, electrical equipment, and other installations will be

determined. This will be done, if possible, by contacting the appropriate client representative to mark the location of the lines. "Call Before You Dig" will verify the potential for encountering subsurface utilities. If the client's knowledge of the area is incomplete, an appropriate device, such as a magnetometer, will be used to locate the line.

Combustible gas readings of the general work area will be made regularly in areas where and/or during operations when the presence of flammable vapors or gases is suspected, such as during intrusive activities (see Section 5.1). Operations must be suspended and corrective action taken if the airborne flammable concentration reaches 10% of the LEL in the immediate area (a one-foot radius) of the point of drilling, or near any other ignition sources.

Overhead Electrical Clearances - If equipment is operated in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables, can come within the minimum clearances as follows:

Nominal System Voltage	**Minimum Required Clearance**
0-50kV	10 feet
51-100kV	12 feet
101-200kV	15 feet
201-300kV	20 feet
301-500kV	25 feet
501-750kV	35 feet
751-1,000kV	45 feet

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least 4 feet for voltages less than 50kV, 10 feet for voltages of 50 kV to 345 kV, and 16 feet for voltages above 345 kV.

Hoisting Operations - Drillers should never engage the rotary clutch without watching the rotary table, and ensuring it is clear of personnel and equipment.

Unless the drawworks is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.

Drill pipe, auger strings or casing should be picked up slowly. Drill pipe should not be hoisted until the driller is sure that the pipe is latched in the elevator, or the derrickman has signaled that he may safely hoist the pipe.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.

The brakes on the drawworks of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Workers should never stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Catline Operations - Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the catline. The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or catline which is under tension.

Employees rigging loads on catlines shall:

- Keep out from under the load;
- Keep fingers and feet where they will not be crushed;
- Be sure to signal clearly when the load is being picked;
- Use standard visual signals only and not depend on shouting to coworkers; and
- Make sure the load is properly rigged, since a sudden jerk in the catline will shift or drop the load.

Wire Rope - When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or re-socketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less that five full tucks.

Wire rope shall not be secured by knots. Wire rope clips shall not be used to splice rope.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Pipe/Auger Handling - Pipe and auger sections shall be transported by cart or carried by two persons. Individuals should not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

Employees should be instructed never to try to stop rolling pipe or casing; they should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift and move slips. Employees are not permitted to kick slips into position.

When pipe is being hoisted, personnel should not stand where the bottom end of the pipe could whip and strike them.

Pipe and augers stored in racks, catwalks or on flatbed trucks should be secured to prevent rolling.

9.2.5 Subsurface Chemical Sample Collection/Analysis

Description of Tasks

This sub-task consists of the collection of soil samples for subsequent field and laboratory analysis. The physical hazards of soil sampling are primarily associated with the sample collection methods, procedures utilized, and the environment itself.

Hazard Identification

Incidental contact with COCs is the primary hazard associated with sampling the stabilized material. This contact may occur through the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. The primary hazards associated with these sampling procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards directly associated with sampling procedures are generally limited to strains/sprains and potential eye hazards. Potential chemical hazards may include contact with media containing site COCs and potential contact with chemicals used for equipment decontamination.

Controls

PPE – To control dermal exposure during sampling activities, a minimum of Level D protection will be worn. If necessary, based on field observations and site conditions, air monitoring may be conducted during sediment sampling activities. If the results of air monitoring indicate the presence of airborne contaminants in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

9.2.6 UST Closure

9.2.6.1 Working in Confined Spaces

Description of Tasks

The project will involve the closure of several USTs.

Hazard Identification

Closure activities may require the entrance into confined spaces to facilitate cleaning and removal of the USTs.

Controls

All personnel required to enter into confined or enclosed spaces must be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of required protective and emergency equipment. The PO shall comply with all specific regulations that apply to work in dangerous or potentially dangerous areas.

9.2.6.2 Working with Compressed Air

Description of Tasks

The proposed method of purging the USTs includes the injection of compressed gas into the tank and attached piping network.

Hazard Identification

Uncontrolled release of the highly pressured air can cause injury to FP during this task. Cylinders must also be properly managed to ensure they are not compromised during storage and/or use.

Controls

Pressure Regulation – Compressed air used for cleaning purposes shall be reduced to less than 30 pounds per square inch and then only with effective chip guarding and personal protective equipment.

Cylinder Storage – Valve protection caps shall be in place and secured when compressed gas cylinders are transported, moved, or stored. Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved. Compressed gas cylinders shall be secured in an upright position at all times, except if necessary for short periods of time when cylinders are actually being hoisted or carried. Cylinders shall be placed in a location where they cannot become part of an electrical circuit.

9.2.7 Site Capping System Construction

Refer to Section 8.0 for general safety procedures.

9.2.8 Creek Relocation

Refer to Section 8.0 for general safety procedures.

9.2.9 Decontamination

All equipment will be decontaminated before leaving the site. Personnel involved in decontamination activities may be inadvertently exposed to skin contact with contaminated materials and chemicals brought from the EZ. Personnel involved in decontamination activities must wear PPE that is, at a minimum, one level below the level worn by personnel working in the EZ.

9.2.10 Demobilization

Demobilization involves the removal of all tools, equipment, supplies, and vehicles brought to the site. The hazards of this phase of activity are associated with heavy equipment operation and manual materials handling.

Manual materials handling may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Heavy equipment operation presents noise and vibration hazards, and hot surfaces, to operators. Personnel in the vicinity of heavy equipment operation may be exposed to physical hazards resulting in fractures, contusions, and lacerations and may be exposed to high noise levels. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat-or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.3 Chemical Hazards

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site COCs. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations. Air monitoring requirements for site tasks are outlined in Section 5.1.

COCs at the site include heavy metals, some VOC compounds, some SVOC compounds and potentially other industrial chemicals including PCBs and pesticides.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate. Table 6 lists the primary contaminants that have been identified at the Site and the media in which they are present.

Table 6 – List of Primary Contaminants

Media: Soil		
SVOCs	**Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Benzo(a)anthracene	3.9	PID
Benzo(a)pyrene	3.6	PID
Benzo(b)fluoranthene	5.2	PID
Benzo(k)fluoranthene	1.9	PID
Chrysene	4.1	PID
Dibenz(a,h)anthracene	0.52	PID
Indeno(1,2,3-cd)pyrene	1.9	PID
Metals	**Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Aluminum	12,900	Not Applicable
Cadmium: 18.2	18.2	Not Applicable
Calcium: 12,000	12,000	Not Applicable
Copper	137	Not Applicable
Iron	21,900	Not Applicable
Lead	779	Not Applicable
Nickel	335	Not Applicable
Silver	3.0	Not Applicable
Zinc	762	Not Applicable
Mercury	2.1	Not Applicable
Pesticides/PCBs	**Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Arochlor 1260	1.2	Not Applicable
4,4’-DDT	0.0078	Not Applicable

Media: Soil Vapor		
Volatile Organic Compounds	**Concentration (ug/m3)**	**Applicable Monitoring Instrument**
Carbon Tetrachloride	17	PID
Chloroform	4.3	PID
Tetrachloroethene	200	PID
Trichloroethene	3,000	PID
1,1,1-Trichloroethane	740	PID
1,1,2-Trichloroethane	130	PID

10.0 EMERGENCY PROCEDURES

10.1 General

Prior to the start of operations, the work area will be evaluated for the potential for fire, contaminant release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the FS/SSO immediately.

The FS/SSO will establish evacuation routes and assembly areas for the site. All personnel entering the site will be informed of this route and the assembly area.

10.2 Emergency Response

If an incident occurs, the following steps will be taken:

- The FS/SSO will evaluate the incident and assess the need for assistance and/or evacuation;
- The FS/SSO will call for outside assistance as needed;
- The FS/SSO will ensure the PM is notified promptly of the incident; and
- The FS/SSO will take appropriate measures to stabilize the incident scene.

10.2.1 Fire

In the case of a fire at the site, the FS/SSO will assess the situation and direct fire-fighting activities. The FS/SSO will ensure that the PM is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that site personnel are unable to safely extinguish with one fire extinguisher, the local fire department will be summoned.

10.2.2 Contaminant Release

In the event of a contaminant release, the following steps will be taken:

- Notify FS/SSO immediately;
- Evacuate immediate area of release;
- Conduct air monitoring to determine needed level of PPE; and
- Don required level of PPE and prepare to implement control procedures.

The FS/SSO has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-site areas.

10.3 Medical Emergency

All employee injuries must be promptly reported to the SSO/FS, who will:

- Ensure that the injured employee receives prompt first aid and medical attention;
- In emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- If the injured person is a SESI employee, notify SESI at 973-808-9050.

10.3.1 Emergency Care Steps

Survey the scene. Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.

- Do a primary survey of the victim. Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victim's condition, and help being given.
- Maintain airway and perform rescue breathing as necessary.
- Perform CPR as necessary.
- Do a secondary survey of the victim. Check vital signs and do a head-to-toe exam.

Treat other conditions as necessary. If the victim can be moved, take him/her to a location away from the work area where EMS can gain access.

10.4 First Aid - General

All persons must report any injury or illness to their immediate supervisor or the FS. Trained personnel will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The FS and SSO must fill out an accident/incident report as soon as emergency conditions no longer exist and first aid and/or medical treatment has been ensured. The report must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured person(s) should be transported to the medical facility. If the injured person is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is

any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.4.1 First Aid - Inhalation

Any employee complaining of symptoms of chemical overexposure as described in Section 4, General Site Safety Procedures, will be removed from the work area and transported to the designated medical facility for examination and treatment.

10.4.2 First Aid - Ingestion

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information. If the victim is unconscious, keep them on their side and clear the airway if vomiting occurs.

10.4.3 First Aid - Skin Contact

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the CRZ, to the wash area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he/she shows any sign of skin reddening, irritation, or if he/she requests a medical examination.

10.4.4 First Aid - Eye Contact

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the EZ, must immediately proceed to the eyewash station in the CRZ. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

10.5 Reporting Injuries, Illnesses, and Safety Incidents

Injuries and illnesses, however minor, will be reported to the FS immediately. The FS will complete an injury report and submit it to the HSM, and the PM by end of shift.

10.6 Emergency Information

The means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the daily safety meeting. These agencies are identified in Table 7.

Table 7 – Emergency Contacts

Local Emergency Contacts	**Telephone No.**
EMERGENCY	911
White Plains Hospital	(914) 681-0600
Police Emergency	911
Fire Emergency	911
Rescue Squad	911
Ambulance	911
Miscellaneous Contacts	**Telephone No.**
N.Y. Poison Control Center	(800) 222-1222
National Response Center and Terrorist Hotline	(800) 424-8802
Center for Disease Control	(800) 311-3435
Utility Mark-Out	(800) 962-7962

10.6.1 Directions to Hospital

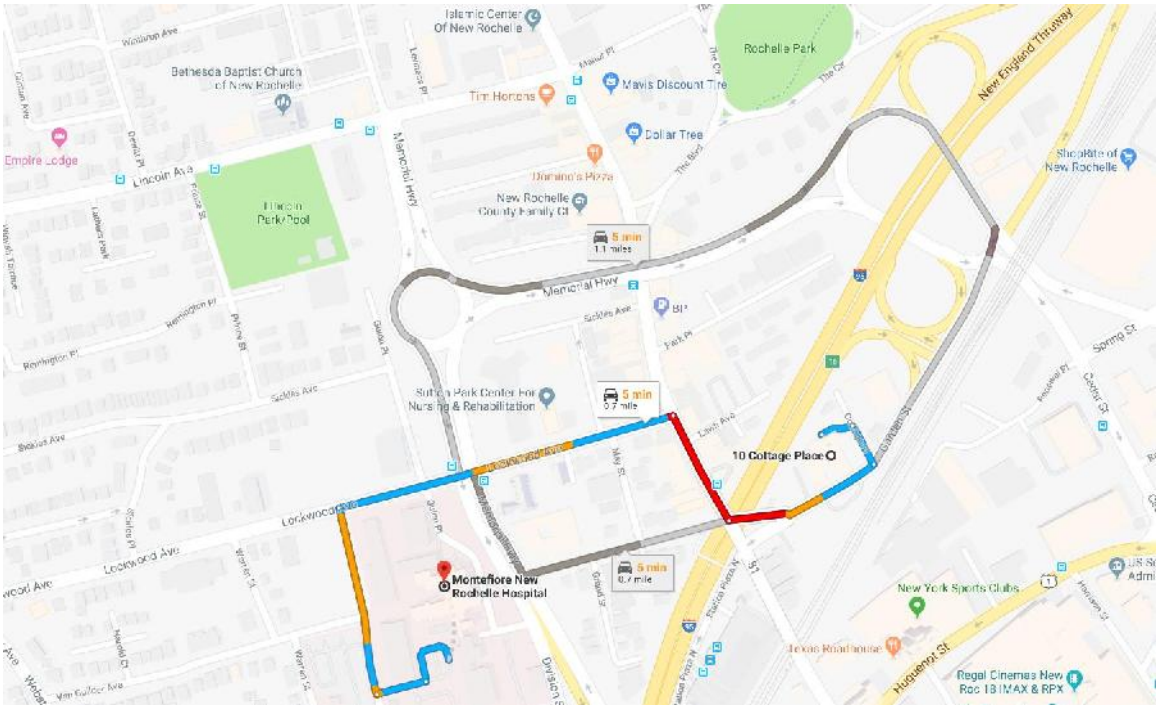
Montefiore New Rochelle Hospital
W677+52 New Rochelle, New York

(914) 632-5000

Directions to Hospital:
Take Cottage Pl to Garden St
1. Head northeast toward Cottage Pl
2. Turn right onto Cottage Pl

Take Lockwood Ave to Glover Johnson Pl
3. Turn right onto Garden St
4. Turn right onto 81/North Ave
5. Turn left onto Lockwood Ave

Continue on Glover Johnson Pl to your destination
6. Turn left onto Glover Johnson Pl
7. Turn left
8. Turn left



11.0 LOGS, REPORTS, AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping for the operations at the subject site.

11.1 HASP Field Change Request

To be completed for initiating a change to the HASP. PM approval is required. The original will be kept in the project file (See Attachment 3).

11.2 Medical and Training Records

The HSM must obtain and keep a log of personnel meeting appropriate training and medical qualifications for the site work. The log will be kept in the project file. Each company's Human Resources Department will maintain medical records, in accordance with 29 CFR 1910.1020.

11.3 Exposure Records

Any personnel monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.1020. For SESI employees, the originals will be sent to the Human Resources Manager. For subcontractor employees, the original file will be sent to the subcontractor employer with a copy maintained in the SESI project file.

11.4 Accident/Incident Report

Any accident/incident reports must be completed following procedures given in Section 10.5 of this HASP. The originals will be sent to the HSM for maintenance. A copy of the forms will be kept in the project file. (See Attachment 4)

11.5 OSHA Form 200

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Human Resources Manager for maintenance. Subcontractor employees must also meet the requirements of maintaining an OSHA 200 Form. The accident/incident report meets the requirements of the OSHA Form 101 (Supplemental Record), which must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

11.6 On-Site Health and Safety Field Logbooks

The HSM or designee will maintain an on-site health and safety log book in which daily Site conditions, activities, personnel, and significant events will be recorded. Calibration records and personnel monitoring results, if available, will also be recorded in the field logbook. The original logbook will be kept in the project file.

Whenever any personnel monitoring is conducted onsite, the monitoring results will be noted in the filed logbook. These will become part of the exposure records file and will be maintained by the HSM.

A signatory page is included (See Attachment 5) and is to be signed by those working on and/or visiting the site.

11.7 Material Safety Data Sheets

Material Safety Data Sheets (MSDS) will be obtained and kept on file at the project site for each hazardous chemical brought to, use, or stored at the Site (See Attachment E).

ATTACHMENT 1

AIR MONITOR LOG

Air Monitoring: Sample Collection and Analysis

Date & Time of Monitoring	Task / Operation Being	Substance(s)/ Hazard(s) Being	Monitoring Location	Type/Method of Monitoring (separate lines for	Monitoring Results	Exposure Limits	Required Action

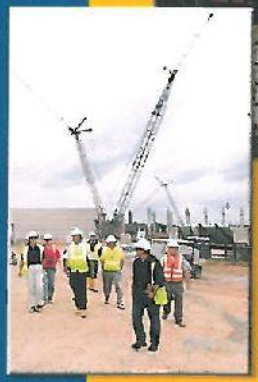
ATTACHMENT 2

OSHA POSTER

Job Safety and Health

It's the law!

OSHA®
Occupational Safety and Health Administration
U.S. Department of Labor



EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA (6742)
www.osha.gov

OSHA 3165-02 2012R

ATTACHMENT 3

FILED CHANGE REQUEST FORM

HEALTH & SAFETY PLAN
CHANGE NOTICE

Pages _____ of _____

Project: H&S-CN

1) HASP VERSION: _____ SECTION: _____ PAGE (s): _____

RE: --- Change to existing HASP Anticipated Revision Date: _____
--- Addition to existing HASP
--- Other: _____
_____CONT._____

2) PROPOSED CHANGE: _____
_____
_____
_____

3) REASON FOR PROPOSED CHANGE(s):
--- Required by SPEC or Change Order --- Other: _____
--- Disposition of Deficiency _____CONT._____
--- Change in Regulatory or Other Requirements
--- Operational Experience

4) EXHIBITS ATTACHED ____ NO ____ YES (If YES, describe) _____
_____CONT._____

5) PMK APPROVALS PROJECT MANAGER: _____ Date: _____
SITE MANAGER: _____ Date: _____
H&S MANAGER: _____ Date: _____

Client Approval Required: ____ NO ____ YES (If YES, date submitted) _____

6) CLIENT APPROVAL _____ APPROVED _____ REMANDED _____ REJECTED

Comments: _____
_____
_____ CONT._____

Client Representative: _____Date: _____

7) DISTRIBUTION AFTER APPROVAL

X HASP UPDATE LIST --- OTHER: _____
X CLIENT _____
X PROJECT FILES _____

8) PREPARED BY: _____Date: _____
Title: _____

ATTACHMENT 4

INJURY REPORT FORM

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (_____) _____ -- _____ Date ___/___/___

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ___/___/___

4) Date hired ___/___/___

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the *Log* _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ___/___/___

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ___/___/___

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20___

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name ___________

City ___________ State ___________

Identify the person			Describe the case			Classify the case — CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:					
(A) Case no.	(B) Employee's name	(C) Job title (*e.g., Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g., Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g., Second degree burns on right forearm from acetylene torch*)	(G) Death	(H) Days away from work	Remained at Work: (I) Job transfer or restriction	Remained at Work: (J) Other record-able cases	(K) Away from work	(L) On job transfer or restriction	(M) (1) Injury	(2) Skin disorder	(3) Respiratory condition	(4) Poisoning	(5) Hearing loss	(6) All other illnesses
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/ month/day			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
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					Page totals ➤	___	___	___	___	___	___	___	___	___	___	___	___
												(1) Injury	(2) Skin disorder	(3) Respiratory condition	(4) Poisoning	(5) Hearing loss	(6) All other illnesses

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Page ___ of ___

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .

	(M)		
(1) Injuries	_____	(4) Poisonings	_____
		(5) Hearing loss	_____
(2) Skin disorders	_____	(6) All other illnesses	_____
(3) Respiratory conditions	_____		

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Establishment Information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (*e.g., Manufacture of motor truck trailers*)

_____

Standard Industrial Classification (SIC), if known (*e.g., 3715*)

__ __ __ __

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

__ __ __ __ __ __

Employment Information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

( ) - / /
Phone Date

ATTACHMENT 5

SIGNATORY PAGE

Attachment 4 – Site-Specific Health and Safety Orientation Signatory Page

Title	Name	Signature
Project Manager:	TBD	
Health and Safety Manager:	TBD	

I have read the attached Health and Safety Plan (HASP) and have received site-specific information and orientation regarding the identified physical, chemical, and biological hazards anticipated at this site. My signature certifies that I understand the procedures, equipment, and restrictions applicable to this project site and agree to abide by them.

Signature	Printed Name	Company	Date

Attachment 4 – Health and Safety Orientation Signatory Page (continued)

Signature	Printed Name	Company	Date

Attachment 6

Material Safety Data Sheets

SAFETY DATA SHEET

Version 4.9
Revision Date 05/27/2016
Print Date 11/09/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Aluminum

Product Number : 11009
Brand : Aldrich
Index-No. : 013-002-00-1

CAS-No. : 7429-90-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable solids (Category 1), H228

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H228 Flammable solid.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P280 Wear protective gloves/ eye protection/ face protection.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Al
Molecular weight	:	26.98 g/mol
CAS-No.	:	7429-90-5
EC-No.	:	231-072-3
Index-No.	:	013-002-00-1
Registration number	:	01-2119529243-45-XXXX

Hazardous components

Component	Classification	Concentration
	Flam. Sol. 1; H228	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Special powder against metal fire Dry sand Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media
Water Carbon dioxide (CO2) ABC powder

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Store in original container. Do not store near combustible materials. Keep in a cool place away from acids. Keep in a cool place away from bases. Keep in a cool place away from oxidizing agents. Keep container tightly closed in a dry and well-ventilated place.

Handle and store under inert gas. Keep in a dry place.
Storage class (TRGS 510): Flammable solid hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	7429-90-5	TWA	1.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Lower Respiratory Tract irritation Pneumoconiosis Neurotoxicity Not classifiable as a human carcinogen		

		TWA	15.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	15.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Lower Respiratory Tract irritation Pneumoconiosis Neurotoxicity Not classifiable as a human carcinogen varies		
		TWA	1.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Lower Respiratory Tract irritation Pneumoconiosis Neurotoxicity Not classifiable as a human carcinogen varies		
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Lower Respiratory Tract irritation Pneumoconiosis Neurotoxicity Not classifiable as a human carcinogen varies		
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Protective gloves against thermal risks

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: silver
b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 660 °C (1,220 °F)
f)	Initial boiling point and boiling range	2,467 °C (4,473 °F)

g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	May form combustible dust concentrations in air.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	2.7 g/mL at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	not auto-flammable
q)	Decomposition temperature	Not applicable
r)	Viscosity	No data available
s)	Explosive properties	Risk of dust explosion.
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Risk of dust explosion.Reacts with water to generate Hydrogen gas.Reacts with the following substances:, Acids, Bases, Oxidizing agents, Halogens

10.4 Conditions to avoid
Humid air water
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Acids, Bases, Halogens, Oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Aluminum oxide
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - > 2,000 mg/kg

LC50 Inhalation - Rat - 4 h - > 888 mg/l

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: BD0330000

Cough, weight loss, anemia, Weakness, Incoordination.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1309 Class: 4.1 Packing group: II
Proper shipping name: Aluminum powder, coated
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG
UN number: 1309 Class: 4.1 Packing group: II EMS-No: F-G, S-G
Proper shipping name: ALUMINIUM POWDER, COATED

IATA
UN number: 1309 Class: 4.1 Packing group: II
Proper shipping name: Aluminium powder, coated

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Aluminium powder (non pyrophoric)	7429-90-5	1994-04-01

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Aluminium powder (non pyrophoric)	7429-90-5	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Aluminium powder (non pyrophoric)	7429-90-5	1994-04-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Aluminium powder (non pyrophoric)	7429-90-5	1994-04-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Flam. Sol.	Flammable solids
H228	Flammable solid.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	3

NFPA Rating
Health hazard: 0

Fire Hazard:	3
Reactivity Hazard:	3

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 05/27/2016 Print Date: 11/09/2018

SAFETY DATA SHEET

Version 5.3
Revision Date 03/27/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Aroclor 1260 Standard

Product Number : SK022
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 4), H413

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H413	May cause long lasting harmful effects to aquatic life.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.

P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight : (No data available)

Hazardous components

Component	Classification	Concentration
2,2,4-Trimethylpentane		
	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H225, H304, H315, H336, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store at room temperature.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
2,2,4-Trimethylpentane	540-84-1	TWA	300 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-106.99 °C (-160.58 °F)
f)	Initial boiling point and boiling range	98 - 99 °C (208 - 210 °F) at 1,013 hPa (760 mmHg)
g)	Flash point	-11.99 °C (10.42 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 6 %(V) Lower explosion limit: 1 %(V)
k)	Vapour pressure	55 hPa (41 mmHg) at 21 °C (70 °F) 117 hPa (88 mmHg) at 37.80 °C (100.04 °F)
l)	Vapour density	3.94 - (Air = 1.0)
m)	Relative density	0.690 g/cm3

n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 4.6
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	3.94 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a

known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence
Nerves. - (Aroclor 1260)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1262 Class: 3 Packing group: II
Proper shipping name: Octanes
Reportable Quantity (RQ): 1001 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG
UN number: 1262 Class: 3 Packing group: II EMS-No: F-E, S-E

Proper shipping name: OCTANES
Marine pollutant:yes Marine pollutant: yes

IATA
UN number: 1262 Class: 3 Packing group: II
Proper shipping name: Octanes

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
2,2,4-Trimethylpentane	540-84-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2,2,4-Trimethylpentane	540-84-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
2,2,4-Trimethylpentane	540-84-1	2007-03-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Aroclor 1260	11096-82-5	2008-08-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Aroclor 1260	11096-82-5	2008-08-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.
Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3

Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.3 Revision Date: 03/27/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 5.8
Revision Date 02/02/2018
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[*a*]pyrene

Product Number : 48564
Brand : Supelco
Index-No. : 601-032-00-3

CAS-No. : 50-32-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin sensitisation (Category 1), H317
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 1B), H360
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H317 May cause an allergic skin reaction.
H340 May cause genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzpyrene
3,4-Benzopyrene
Benzo[def]chrysene
benzo[pqr]tetraphene

Formula : $C_{20}H_{12}$
Molecular weight : 252.31 g/mol
CAS-No. : 50-32-8
EC-No. : 200-028-5
Index-No. : 601-032-00-3

Hazardous components

Component	Classification	Concentration
Benzo[a]pyrene		
	Skin Sens. 1; Muta. 1B; Carc. 1B; Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H317, H340, H350, H360, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low		

		as possible. Suspected human carcinogen		
		Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		
Benzo[a]pyrene	50-32-8	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological	Basis

				specimen	
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance — Form: solid

b) Odour — No data available

c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 177 - 180 °C (351 - 356 °F)
f)	Initial boiling point and boiling range	495 °C (923 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.35 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 5.97
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Subcutaneous - Rat - 50 mg/kg

Skin corrosion/irritation
Skin - Mouse
Result: Mild skin irritation

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
Chronic exposure may cause dermatitis.

Germ cell mutagenicity
May alter genetic material.
In vivo tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Benzo[a]pyrene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benzo[a]pyrene)
OSHA:	OSHA specifically regulated carcinogen (Benzo[a]pyrene)

Reproductive toxicity
May cause congenital malformation in the fetus.
Presumed human reproductive toxicant

May cause reproductive disorders.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.25 mg/l - 48 h
Toxicity to algae	EC50 - Pseudokirchneriella subcapitata (green algae) - 0.02 mg/l - 72 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 48 h - 0.0005 mg/l
	Bioconcentration factor (BCF): 3,208

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Benzo[a]pyrene)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[a]pyrene)
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[a]pyrene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date

Benzo[a]pyrene	50-32-8	2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	1990-01-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H317	May cause an allergic skin reaction.
H340	May cause genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Muta.	Germ cell mutagenicity

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 02/02/2018 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>b</>]fluoranthene

Product Number : 48490
Brand : Supelco
Index-No. : 601-034-00-4

CAS-No. : 205-99-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	3,4-Benzofluoranthene
Formula	:	C<SB>20</>H<SB>12</>
Molecular weight	:	252.31 g/mol
CAS-No.	:	205-99-2
EC-No.	:	205-911-9
Index-No.	:	601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benz[e]acephenanthrylene	205-99-2	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 163 - 165 °C (325 - 329 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
TDLo Oral - Mouse - 7.57 mg/kg
Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h(Benz[e]acephenanthrylene)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[e]acephenanthrylene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[e]acephenanthrylene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	205-99-2	2007-09-28
Benz[e]acephenanthrylene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350 May cause cancer.

H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/16/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>k</>]fluoranthene

Product Number : 48492
Brand : Supelco
Index-No. : 601-036-00-5

CAS-No. : 207-08-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C<SB>20</>H<SB>12</>
Molecular weight	:	252.31 g/mol
CAS-No.	:	207-08-9
EC-No.	:	205-916-6
Index-No.	:	601-036-00-5

Hazardous components

Component	Classification	Concentration
Benzo[k]fluoranthene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzo[k]fluoranthene	207-08-9	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Personal protective equipment
Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystalline Colour: yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 215 - 217 °C (419 - 423 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available

m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Carcinogenicity- Rat- Implant

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benzo[k]fluoranthene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benzo[k]fluoranthene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: DF6350000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benzo[k]fluoranthene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[k]fluoranthene)

Reportable Quantity (RQ) : 5000 lbs

no
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[k]fluoranthene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[k]fluoranthene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[k]fluoranthene	207-08-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[k]fluoranthene	207-08-9	1994-04-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	207-08-9	2007-09-28
Benzo[k]fluoranthene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/16/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Benz[*a*]anthracene
Product Number	:	48563
Brand	:	Supelco
Index-No.	:	601-033-00-9
CAS-No.	:	56-55-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 Spruce Street ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,2-Benzanthracene Tetraphene
Formula	:	C<SB>18</>H<SB>12</>
Molecular weight	:	228.29 g/mol
CAS-No.	:	56-55-3
EC-No.	:	200-280-6
Index-No.	:	601-033-00-9

Hazardous components

Component	Classification	Concentration
Benz[a]anthracene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 157 - 159 °C (315 - 318 °F)
f)	Initial boiling point and boiling range	437.6 °C (819.7 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available

n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
LD50 Intravenous - Rat - > 200 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[a]anthracene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods
IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[a]anthracene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[a]anthracene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Benz[a]anthracene	CAS-No. 56-55-3	Revision Date 2007-09-28
WARNING! This product contains a chemical known to the State of California to cause cancer. Benz[a]anthracene	CAS-No. 56-55-3	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 4.10
Revision Date 08/10/2016
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Cadmium

Product Number : 265330
Brand : Aldrich
Index-No. : 048-002-00-0

CAS-No. : 7440-43-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Inhalation (Category 2), H330
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - repeated exposure (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H330 Fatal if inhaled.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H361 Suspected of damaging fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Cd
Molecular weight	:	112.41 g/mol
CAS-No.	:	7440-43-9
EC-No.	:	231-152-8
Index-No.	:	048-002-00-0

Hazardous components

Component	Classification	Concentration
Cadmium Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
	Acute Tox. 2; Muta. 2; Carc. 1B; Repr. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H330, H341, H350, H361, H372, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Air sensitive.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Substance listed; for more information see OSHA document 1910.1027		
Cadmium	7440-43-9	TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.5-1970 This standard applies to any operations or sectors for which the		

		Cadmium standard, 1910.1027, is stayed or otherwise not in effect.		
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.5-1970 This standard applies to any operations or sectors for which the Cadmium standard, 1910.1027, is stayed or otherwise not in effect.		
		CEIL	0.3 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.5-1970 This standard applies to any operations or sectors for which the Cadmium standard, 1910.1027, is stayed or otherwise not in effect.		
		CEIL	0.6 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.5-1970 This standard applies to any operations or sectors for which the Cadmium standard, 1910.1027, is stayed or otherwise not in effect.		
		Potential Occupational Carcinogen See Appendix A		
		TWA	0.01 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen varies		
		TWA	0.002 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen varies		
		PEL	0.005 mg/m3	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1027 This standard applies to all occupational exposures to cadmium and cadmium compounds, in all forms, and in all industries covered by the Occupational Safety and Health Act, except the construction-related industries, which are covered under 29 CFR 1926.63. OSHA specifically regulated carcinogen		
		PEL	0.005 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see Sections 1532 & 5207		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Cadmium	7440-43-9	cadmium	5 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Not critical			
		cadmium	5µg/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
		Not critical			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: granular Colour: light grey
b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 320.9 °C (609.6 °F) - lit.
f)	Initial boiling point and boiling range	765 °C (1,409 °F) - lit.
g)	Flash point	Not applicable

h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	8.65 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.0023 g/l at 20 °C (68 °F)
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Cadmium/cadmium oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 2,330 mg/kg

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: 1 - Group 1: Carcinogenic to humans (Cadmium)

NTP: Known to be human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Cadmium)

OSHA: OSHA specifically regulated carcinogen (Cadmium)

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: EU9800000

Damage to the lungs., Kidney injury may occur., prolonged or repeated exposure can cause:, Vomiting, Diarrhoea, Lung irritation

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.001 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.024 mg/l - 48 h
Toxicity to algae	static test EC50 - Selenastrum capricornutum (green algae) - 0.023 mg/l - 72 h (OECD Test Guideline 201)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
Bioaccumulation: Oncorhynchus mykiss (rainbow trout) - 72 d - 1.27 µg/l

Bioconcentration factor (BCF): 55

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
Very toxic to aquatic life with long lasting effects.
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3288 Class: 6.1 Packing group: II
Proper shipping name: Toxic solid, inorganic, n.o.s. (Cadmium)
Reportable Quantity (RQ): 10 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 3288 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, INORGANIC, N.O.S. (Cadmium)
Marine pollutant:yes

IATA
UN number: 3288 Class: 6.1 Packing group: II
Proper shipping name: Toxic solid, inorganic, n.o.s. (Cadmium)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Cadmium	7440-43-9	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Cadmium	7440-43-9	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Cadmium	7440-43-9	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Cadmium	7440-43-9	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Cadmium	7440-43-9	2009-02-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Cadmium	7440-43-9	2009-02-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H330	Fatal if inhaled.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	4
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	4
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.10 Revision Date: 08/10/2016 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 4.9
Revision Date 05/24/2016
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Calcium

Product Number : 215147
Brand : Aldrich
Index-No. : 020-001-00-X

CAS-No. : 7440-70-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Substances and mixtures, which in contact with water, emit flammable gases (Category 2), H261

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H261 In contact with water releases flammable gases.

Precautionary statement(s)
P223 Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232 Handle under inert gas. Protect from moisture.
P280 Wear protective gloves/ eye protection/ face protection.
P335 + P334 Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404 Store in a dry place. Store in a closed container.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Ca
Molecular weight	:	40.08 g/mol
CAS-No.	:	7440-70-2
EC-No.	:	231-179-5
Index-No.	:	020-001-00-X

Hazardous components

Component	Classification	Concentration
Calcium		
	Water-react. 2; H261	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Handle and store under inert gas. Air sensitive.
Storage class (TRGS 510): Hazardous materials, which set free flammable gases upon contact with water

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an

industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: granular Colour: silver
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 850 °C (1,562 °F) - lit.
f)	Initial boiling point and boiling range	1,484 °C (2,703 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.54 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
Strong oxidizing agents, Alcohols

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Calcium oxide
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1401 Class: 4.3 Packing group: II
Proper shipping name: Calcium
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG
UN number: 1401 Class: 4.3 Packing group: II EMS-No: F-G, S-O
Proper shipping name: CALCIUM

IATA
UN number: 1401 Class: 4.3 Packing group: II

Proper shipping name: Calcium

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Reactivity Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Calcium	7440-70-2	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Calcium	7440-70-2	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Calcium	7440-70-2	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H261	In contact with water releases flammable gases.
Water-react.	Substances and mixtures, which in contact with water, emit flammable gases

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	0
Fire Hazard:	3
Reactivity Hazard:	1
Special hazard.I:	W

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 05/24/2016 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 5.10
Revision Date 09/28/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Carbon tetrachloride

Product Number : 289116
Brand : Sigma-Aldrich
Index-No. : 602-008-00-5

CAS-No. : 56-23-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Skin sensitisation (Sub-category 1B), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Inhalation (Category 1), Liver, Kidney, H372
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412
Hazardous to the ozone layer (Category 1), H420

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs (Liver, Kidney) through prolonged or repeated exposure if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.
P502	Refer to manufacturer/ supplier for information on recovery/ recycling.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Rapidly absorbed through skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Tetrachloromethane
Formula	:	CCl_4CCl_4
Molecular weight	:	153.82 g/mol
CAS-No.	:	56-23-5
EC-No.	:	200-262-8
Index-No.	:	602-008-00-5

Hazardous components

Component	Classification	Concentration
Tetrachloromethane		
	Acute Tox. 3; Skin Sens. 1B; Carc. 2; STOT RE 1; Aquatic Acute 3; Aquatic Chronic 3; Ozone 1; H301 + H311 + H331, H317, H351, H372, H412, H420	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Tetrachloromethane	56-23-5	TWA	5.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Suspected human carcinogen Danger of cutaneous absorption		
		STEL	10.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Liver damage Suspected human carcinogen Danger of cutaneous absorption		
		ST	2.000000 ppm 12.600000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	10.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.17-1967		
		CEIL	25.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.17-1967		
		Peak	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.17-1967		
		See Table Z-2		
		TWA	5 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Liver damage Suspected human carcinogen Danger of cutaneous absorption		
		STEL	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Liver damage Suspected human carcinogen Danger of cutaneous absorption		
		ST	2 ppm 12.6 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		See Table Z-2		
		TWA	10 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.17-1967		
		CEIL	25 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.17-1967		
		Peak	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.17-1967		

		TWA	2 ppm 12.6 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	2 ppm 12.6 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		C	200 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		STEL	10 ppm 63 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 240 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	sweet
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -23 °C (-9 °F) - lit.
f)	Initial boiling point and boiling range	76 - 77 °C (169 - 171 °F) - lit.
g)	Flash point	does not flash
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	45 hPa (34 mmHg) at 0.3 °C (32.5 °F) 120 hPa (90 mmHg) at 19.8 °C (67.6 °F) 14,549 hPa (10,913 mmHg) at 24 °C (75 °F)
l)	Vapour density	No data available
m)	Relative density	1.594 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.8461 g/l at 20 °C (68 °F)
o)	Partition coefficient: n-octanol/water	log Pow: 2.83 at 25 °C (77 °F)
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	26.7 mN/m at 20 °C (68 °F) 19.5 mN/m at 80 °C (176 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 2,350 mg/kg

LC50 Inhalation - Rat - 4 h - 8000 ppm

LD50 Dermal - Rabbit - > 20,000 mg/kg

No data available

Skin corrosion/irritation

Skin - Rabbit
Result: Mild skin irritation - 24 h
(Draize Test)

Serious eye damage/eye irritation

Eyes - Rabbit
Result: Mild eye irritation - 24 h
(Draize Test)

Respiratory or skin sensitisation

- Mouse
Result: The product is a skin sensitiser, sub-category 1B.
(OECD Test Guideline 429)

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification. Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Tetrachloromethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Tetrachloromethane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Inhalation - Causes damage to organs through prolonged or repeated exposure. - Liver, Kidney

Aspiration hazard

No data available

Additional Information

RTECS: FG4900000

Vomiting, Diarrhoea, Abdominal pain, Nausea, Dizziness, Headache, Damage to the eyes., Liver injury may occur., Kidney injury may occur., Exposure to and/or consumption of alcohol may increase toxic effects., Contact with skin can cause:, Pain, Erythema, hyperemia

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Danio rerio (zebra fish) - 24.3 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 35 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	Growth inhibition EC50 - Algae - 20 mg/l - 72 h (OECD Test Guideline 201)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 21 d - 52.3 µg/l
	Bioconcentration factor (BCF): 30

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1846 Class: 6.1 Packing group: II
Proper shipping name: Carbon tetrachloride
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1846 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: CARBON TETRACHLORIDE
Marine pollutant: yes

IATA

UN number: 1846 Class: 6.1 Packing group: II
Proper shipping name: Carbon tetrachloride

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Tetrachloromethane	56-23-5	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Tetrachloromethane	56-23-5	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Tetrachloromethane	56-23-5	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Tetrachloromethane	56-23-5	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Tetrachloromethane	56-23-5	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H311	Toxic in contact with skin.
H317	May cause an allergic skin reaction.
H331	Toxic if inhaled.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.10 Revision Date: 09/28/2017 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 3.18
Revision Date 08/14/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Chloroform

Product Number : C2432
Brand : Sigma-Aldrich
Index-No. : 602-006-00-4

CAS-No. : 67-66-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 3), H331
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 2), H361d
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Specific target organ toxicity - repeated exposure (Category 1), Liver, Kidney, H372
Acute aquatic toxicity (Category 3), H402

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H331 Toxic if inhaled.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.

H361d	Suspected of damaging the unborn child.
H372	Causes damage to organs (Liver, Kidney) through prolonged or repeated exposure.
H402	Harmful to aquatic life.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Trichloromethane Methylidyne trichloride
Formula	:	$CHCl_3$
Molecular weight	:	119.38 g/mol
CAS-No.	:	67-66-3
EC-No.	:	200-663-8
Index-No.	:	602-006-00-4

Hazardous components

Component	Classification	Concentration
Chloroform		
	Acute Tox. 4; Acute Tox. 3; Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; Repr. 2; STOT SE 3; STOT RE 1; Aquatic Acute 3; H302, H315, H319, H331, H336, H351, H361d, H372, H402	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Chloroform	67-66-3	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Liver damage Embryo/fetal damage Confirmed animal carcinogen with unknown relevance to humans		
		ST	2 ppm 9.78 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		C	50 ppm 240 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.		
		PEL	2 ppm 9.78 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	sweet
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -63 °C (-81 °F)
f)	Initial boiling point and boiling range	60.5 - 61.5 °C (140.9 - 142.7 °F)
g)	Flash point	- DIN 51755 Part 1does not flash
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	210 hPa (158 mmHg) at 20 °C (68 °F)
l)	Vapour density	4.12 - (Air = 1.0)
m)	Relative density	1.492 g/mL at 25 °C (77 °F)
n)	Water solubility	8.7 g/l at 23 °C (73 °F) - OECD Test Guideline 105
o)	Partition coefficient: n-octanol/water	log Pow: 1.97 at 25 °C (77 °F) - (ECHA), Bioaccumulation is not expected.
p)	Auto-ignition temperature	> 600 °C (> 1,112 °F) at 1,013 hPa (760 mmHg) - DIN 51794
q)	Decomposition temperature	Distillable in an undecomposed state at normal pressure.
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Solubility in other solvents	organic solvent at 20 °C (68 °F) - miscible
Surface tension	27.1 mN/m at 20.0 °C (68.0 °F)
Relative vapour density	4.12 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.
Contains the following stabiliser(s):
2-Methyl-2-butene (>=0.001 - <=0.015 %)

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
various plastics, Rubber

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 908 mg/kg
(OECD Test Guideline 401)
Remarks: Behavioral:Change in motor activity (specific assay). Behavioral:Ataxia. Lungs, Thorax, or Respiration:Respiratory stimulation.

LOEC Inhalation - Rat - male - 6 h - 500 ppm
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

LD50 Dermal - Rabbit - > 20,000 mg/kg
Remarks: (RTECS)

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Irritating to skin. - 24 h
Remarks: (ECHA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irritating to eyes.
Remarks: (ECHA)

Respiratory or skin sensitisation
Sensitisation test: - Guinea pig
Result: negative
(Maximisation Test)
Remarks: (ECHA)

Germ cell mutagenicity
Ames test
Salmonella typhimurium
Result: negative

reverse mutation assay
Escherichia coli
Result: negative
(ECHA)

OECD Test Guideline 474
Rat - male and female - Bone marrow
Result: negative

OECD Test Guideline 486
Rat - male - Other cell types
Result: negative

Carcinogenicity

Carcinogenicity - Rat - Oral
Tumorigenic:Carcinogenic by RTECS criteria. Leukaemia

Suspected of causing cancer.

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Chloroform)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Chloroform)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure. - Liver, Kidney

Aspiration hazard
No data available

Additional Information
RTECS: FS9100000

Vomiting, Cough, irritant effects, Shortness of breath, respiratory arrest, narcosis, Dizziness, Nausea, agitation, spasms, inebriation, Headache, Stomach/intestinal disorders, ataxia (impaired locomotor coordination), cardiovascular disorders Drying-out effect resulting in rough and chapped skin.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Danio rerio (zebra fish) - 121 mg/l - 48 h (OECD Test Guideline 203)
	static test LC50 - Pimephales promelas (fathead minnow) - 103 - 171 mg/l - 96 h Remarks: (ECHA)
	flow-through test LC50 - Oncorhynchus mykiss (rainbow trout) - 18.2 mg/l - 96 h Remarks: (ECHA)
	flow-through test LC50 - Micropterus dolomieui - 51 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 79 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	static test ErC50 - Chlamydomonas reinhardtii (green algae) - 13.3 mg/l - 72 h Remarks: (ECHA)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 14 d

Result: 0 % - Not readily biodegradable.
(OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation

Cyprinus carpio (Carp) - 42 d
at 25 °C - 0.1 mg/l

Bioconcentration factor (BCF): 4.1 - 13
(OECD Test Guideline 305)

Cyprinus carpio (Carp) - 42 d
at 25 °C - 1 mg/l

Bioconcentration factor (BCF): 1.4 - 4.7
(OECD Test Guideline 305)

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1888 Class: 6.1 Packing group: III
Proper shipping name: Chloroform
Reportable Quantity (RQ): 10 lbsReportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 1888 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: CHLOROFORM

IATA

UN number: 1888 Class: 6.1 Packing group: III
Proper shipping name: Chloroform

15. REGULATORY INFORMATION

SARA 302 Components

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Reportable Quantity : D022 lbs

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Chloroform	67-66-3	2008-11-03

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. Chloroform	67-66-3	2011-09-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H361d	Suspected of damaging the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.
Repr.	Reproductive toxicity
Skin Irrit.	Skin irritation
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.18 Revision Date: 08/14/2018 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 5.5
Revision Date 01/10/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Chrysene

Product Number : 35754
Brand : Sigma-Aldrich
Index-No. : 601-048-00-0

CAS-No. : 218-01-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P273 Avoid release to the environment.
P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_{18}H_{12}$
Molecular weight	:	228.29 g/mol
CAS-No.	:	218-01-9
EC-No.	:	205-923-4
Index-No.	:	601-048-00-0

Hazardous components

Component	Classification	Concentration
Chrysene		
	Muta. 2; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H341, H350, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Confirmed animal carcinogen with unknown relevance to humans		
Chrysene	218-01-9	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen		

		NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 252 - 254 °C (486 - 489 °F) - lit.
f)	Initial boiling point and boiling range	448 °C (838 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 5.73
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Mouse - > 320 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Chrysene)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	OSHA specifically regulated carcinogen (Chrysene)

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: GC0700000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1.90 mg/l - 2 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Chrysene)
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Chrysene)
Marine pollutant:yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Chrysene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Chrysene	218-01-9	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.5 Revision Date: 01/10/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 4.8
Revision Date 09/03/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Copper

Product Number : 31284
Brand : Aldrich

CAS-No. : 7440-50-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : Cu
Molecular weight : 63.55 g/mol
CAS-No. : 7440-50-8
EC-No. : 231-159-6

Hazardous components

Component	Classification	Concentration
Copper		
		90 - 100 %

SAFETY DATA SHEET

Version 5.6
Revision Date 05/07/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4,4′-DDT

Product Number : 31041
Brand : Sigma-Aldrich
Index-No. : 602-045-00-7

CAS-No. : 50-29-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 3), H311
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P281	Use personal protective equipment as required.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane 1,1-Bis(4-chlorophenyl)-2,2,2-trichloroethane
Formula	:	$C_{14}H_9Cl_5$
Molecular weight	:	354.49 g/mol
CAS-No.	:	50-29-3
EC-No.	:	200-024-3
Index-No.	:	602-045-00-7

Hazardous components

Component	Classification	Concentration
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane		
	Acute Tox. 3; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H301 + H311, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 107 - 110 °C (225 - 230 °F) - lit.
f)	Initial boiling point and boiling range	260.0 °C (500.0 °F)
g)	Flash point	72.0 - 77.0 °C (161.6 - 170.6 °F)
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	0.0000021 hPa (0.0000016 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.99 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.91
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Iron and iron salts.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 87.0 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 300.0 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Muscle weakness. Behavioral:Ataxia.

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: KJ3325000

CNS stimulation.

Pancreas. -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.01 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.01 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.003400 mg/l - 96.0 h
	LOEC - Oncorhynchus mykiss (rainbow trout) - 150 mg/l - 3.0 d
	NOEC - Oncorhynchus mykiss (rainbow trout) - 113 mg/l - 3.0 d
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 0.00108 mg/l - 48 h
Toxicity to algae	LC100 - Scenedesmus quadricauda (Green algae) - > 20 mg/l - 7 d

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus mykiss (rainbow trout) - 20 d - 0.001 mg/l
	Bioconcentration factor (BCF): 46,670

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Reportable Quantity (RQ): 1 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG

UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Marine pollutant:yes

IATA

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin.
H311	Toxic in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/07/2018 Print Date: 01/21/2019

4. FIRST AID MEASURES

4.1 Description of first aid measures

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact
Wash off with soap and plenty of water.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas.
For personal protection see section 8.

6.2 Environmental precautions
No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store under inert gas. Air sensitive.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Copper	7440-50-8	TWA	1.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Irritation Gastrointestinal metal fume fever		
		TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointestinal metal fume fever		
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.100000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointestinal metal fume fever		
		TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointestinal metal fume fever		
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	0.1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
General industrial hygiene practice.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
No special environmental precautions required.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Wire Colour: light red
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 1,083.4 °C (1,982.1 °F)
f)	Initial boiling point and boiling range	2,567 °C (4,653 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available

k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	8.940 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong acids, Strong oxidizing agents, Acid chlorides, Halogens

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Copper oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Mouse - 3.5 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: GL5325000

Symptoms of systemic copper poisoning may include: capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure. Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has lead to hemolytic anemia and accelerates arteriosclerosis.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Copper	7440-50-8	1989-08-11

	CAS-No.	Revision Date
Copper	7440-50-8	1989-08-11

New Jersey Right To Know Components

	CAS-No.	Revision Date
Copper	7440-50-8	1989-08-11

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.8 Revision Date: 09/03/2017 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Dibenz[<I>a</>,<I>h</>]anthracene
Product Number	:	48574
Brand	:	Supelco
Index-No.	:	601-041-00-2
CAS-No.	:	53-70-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 Spruce Street ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H350	May cause cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 1,2:5,6-Dibenzanthracene

Formula : C<SB>22</>H<SB>14</>
Molecular weight : 278.35 g/mol
CAS-No. : 53-70-3
EC-No. : 200-181-8
Index-No. : 601-041-00-2

Hazardous components

Component	Classification	Concentration
Dibenz[a,h]anthracene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 262 - 265 °C (504 - 509 °F) - lit.
f)	Initial boiling point and boiling range	524 °C (975 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available

n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: HN2625000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Lungs -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 0.496 mg/l - 24 h(Dibenz[a,h]anthracene)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Dibenz[a,h]anthracene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods
IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Dibenz[a,h]anthracene)

Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Dibenz[a,h]anthracene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Dibenz[a,h]anthracene	53-70-3	

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Dibenz[a,h]anthracene	53-70-3	

	CAS-No.	Revision Date
Dibenz[a,h]anthracene	53-70-3	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Dibenz[a,h]anthracene	53-70-3	

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Dibenz[a,h]anthracene	CAS-No. 53-70-3	Revision Date

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 5.6
Revision Date 12/11/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Indeno[1,2,3-*cd*]pyrene

Product Number : 48499
Brand : Supelco

CAS-No. : 193-39-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 2), H351

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H351 Suspected of causing cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_{22}H_{12}$
Molecular weight	:	276.33 g/mol
CAS-No.	:	193-39-5
EC-No.	:	205-893-2

Hazardous components

Component	Classification	Concentration
Indeno[1,2,3-cd]pyrene		
	Carc. 2; H351	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.
Hazardous components without workplace control parameters

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Indeno[1,2,3-cd]pyrene	193-39-5	1-Hydroxypyrene (1-HP)		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the

sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	163.6 °C (326.5 °F)
f)	Initial boiling point and boiling range	536.0 °C (996.8 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Indeno[1,2,3-cd]pyrene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Indeno[1,2,3-cd]pyrene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Indeno[1,2,3-cd]pyrene	CAS-No. 193-39-5	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
H351	Suspected of causing cancer.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 12/11/2017 Print Date: 11/10/2018

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006
Version 6.0 Revision Date 10.11.2016
Print Date 21.01.2019
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Iron Metal Clinical

Product Number : NIST937
Brand : Sigma-Aldrich
REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

2.2 Label elements

2.3 Other hazards - none

SECTION 3: Composition/information on ingredients

SECTION 4: First aid measures

4.1 Description of first aid measures

No data available

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media
No data available

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
No data available

5.4 Further information
No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
For personal protection see section 8.

6.2 Environmental precautions
No data available

6.3 Methods and materials for containment and cleaning up
No data available

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
No data available

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls
No data available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	No data available
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
No data available

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation

Germ cell mutagenicity

Carcinogenicity

Reproductive toxicity

Specific target organ toxicity - single exposure

Specific target organ toxicity - repeated exposure

Aspiration hazard

Additional Information
RTECS: Not available

SECTION 12: Ecological information

12.1 Toxicity

12.2 Persistence and degradability

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods
No data available

SECTION 14: Transport information

14.1 UN number

ADR/RID: -	IMDG: -	IATA: -

14.2 UN proper shipping name

ADR/RID:	Not dangerous goods
IMDG:	Not dangerous goods
IATA:	Not dangerous goods

14.3 Transport hazard class(es)

ADR/RID: -	IMDG: -	IATA: -

14.4 Packaging group

ADR/RID: -	IMDG: -	IATA: -

14.5 Environmental hazards

ADR/RID: no	IMDG Marine pollutant: no	IATA: no

14.6 Special precautions for user
No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical safety assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

SDS preview

LEAD

DANGER

7439-92-1

by Fisher Scientific

Synonyms

C.I. 77575, C.I. Pigment Metal 4, EINECS 231-100-4, Glover, HSDB 231, Lead flake, Olow, Plumbum, CI 77575, Plumbum metallicum, Blei, CI pigment metal 4, EC 231-100-4, KS-4, Lead, Lead element, Lead S2, Olow [Polish], Omaha & grant, Pb-S 100, Rough lead bullion, CCRIS 1581, Lead metal, Lead S 2, SSO 1, UNII-2P299V784P

Hazard statements

Harmful if inhaled
Harmful if swallowed
May cause cancer
May cause damage to organs through prolonged or repeated exposure
May cause drowsiness or dizziness

Precautions

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Rinse mouth
Store locked up

Hazard category

Acute toxicity, inhalation, Acute toxicity, oral, Carcinogenicity, Specific target organ toxicity, repeated exposure, Specific target organ toxicity, single exposure; Narcotic effects

View GHS label

:2008&param1=ZmRwLjFfNzE0NjEwMDNORQ==&unique=1525284976)

The information contained herein is based on data compiled from the chemical components of the (M)SDS and may not accurately represent the safety hazards for the product. Only the manufacturer of the product can make actual representations about the hazard profile of a chemical product. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

SAFETY DATA SHEET

Version 3.15
Revision Date 03/05/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Mercury

Product Number : 215457
Brand : Sigma-Aldrich
Index-No. : 080-001-00-0

CAS-No. : 7439-97-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Inhalation (Category 2), H330
Reproductive toxicity (Category 1B), H360
Specific target organ toxicity - repeated exposure (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H330 Fatal if inhaled.
H360 May damage fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Hg
Molecular weight	:	200.59 g/mol
CAS-No.	:	7439-97-6
EC-No.	:	231-106-7
Index-No.	:	080-001-00-0

Hazardous components

Component	Classification	Concentration
Mercury		
	Acute Tox. 2; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H330, H360, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. In some instances, a mercury spill kit may be used. Please consult with your site EHS representative to determine the most appropriate clean up method.Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Mercury	7439-97-6	C	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
	Remarks	Potential for dermal absorption		
		CEIL	1.0mg/10m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	0.05 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: silver, white

b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -38.87 °C (-37.97 °F) - lit.
f)	Initial boiling point and boiling range	356.6 °C (673.9 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	< 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) 1 hPa (1 mmHg) at 126 °C (259 °F)
l)	Vapour density	6.93 - (Air = 1.0)
m)	Relative density	13.55 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.00006 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	6.93 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Ammonia, Azides, Nitrates, Chlorates, Copper

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Mercury/mercury oxides.
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LC50 Inhalation - Rat - male - 2 h - < 27 mg/m3

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Presumed human reproductive toxicant

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: OV4550000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Cyprinus carpio (Carp) - 0.160 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation	Carassius auratus (goldfish) - 1,789 d - 0.25 µg/l

Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: A. W. Mercury
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

IATA
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: Mercury

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Mercury	CAS-No. 7439-97-6	Revision Date 2013-12-20

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.15 Revision Date: 03/05/2018 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 4.9
Revision Date 04/24/2018
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Nickel

Product Number : 577995
Brand : Aldrich
Index-No. : 028-002-01-4

CAS-No. : 7440-02-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Inhalation (Category 1), H372
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Ni
Molecular weight	:	58.69 g/mol
CAS-No.	:	7440-02-0
EC-No.	:	231-111-4
Index-No.	:	028-002-01-4

Hazardous components

Component	Classification	Concentration
Nickel, powder [particle diameter < 1 mm]		
	Skin Sens. 1; Carc. 2; STOT RE 1; Aquatic Acute 3; Aquatic Chronic 3; H317, H351, H372, H412	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Handle and store under inert gas. Keep in a dry place.
Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Nickel, powder [particle diameter < 1 mm]	7440-02-0	TWA	1.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Dermatitis Pneumoconiosis Not suspected as a human carcinogen		

		PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.015 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point: 1,455 °C (2,651 °F)
f)	Initial boiling point and boiling range	2,730 °C (4,946 °F)
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	1 hPa (1 mmHg) at 1,810 °C (3,290 °F)
l)	Vapour density	No data available
m)	Relative density	8.9 g/cm3 at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	Not applicable for inorganic substances
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
acids, Oxidizing agents, Sulphur compounds, Hydrogen gas, Oxygen, Methanol, organic solvents, Aluminium, Fluorine, Ammonia

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Nickel/nickel oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - > 9,000 mg/kg
(OECD Test Guideline 401)

Dermal: No data available

No data available

Skin corrosion/irritation

Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitisation

Germ cell mutagenicity

No data available

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	1 - Group 1: Carcinogenic to humans (Nickel, powder [particle diameter < 1 mm])
	2B - Group 2B: Possibly carcinogenic to humans (Nickel, powder [particle diameter < 1 mm])
IARC:	1 - Group 1: Carcinogenic to humans (Nickel, powder [particle diameter < 1 mm])
	2B - Group 2B: Possibly carcinogenic to humans (Nickel, powder [particle diameter < 1 mm])
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Nickel, powder [particle diameter < 1 mm])
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Inhalation - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

Additional Information

Repeated dose toxicity	Rat - male and female - Inhalation - LOAEL : 0.0001 mg/l - OECD Test Guideline 451

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	semi-static test LC50 - Oncorhynchus mykiss (rainbow trout) - 15.3 mg/l - 96 h

12.2 Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3089 Class: 4.1 Packing group: II
Proper shipping name: Metal powders, flammable, n.o.s.
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG

IATA
UN number: 3089 Class: 4.1 Packing group: II
Proper shipping name: Metal powder, flammable, n.o.s.

15. REGULATORY INFORMATION

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Nickel, powder [particle diameter < 1 mm]	7440-02-0	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Nickel, powder [particle diameter < 1 mm]	7440-02-0	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Nickel, powder [particle diameter < 1 mm]	7440-02-0	2007-07-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	7440-02-0	2007-09-28
Nickel, powder [particle diameter < 1 mm]		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	1
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	1
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 04/24/2018 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 4.9
Revision Date 05/04/2017
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Silver

Product Number : 576832
Brand : Aldrich

CAS-No. : 7440-22-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P273 Avoid release to the environment.
P391 Collect spillage.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : Ag
Molecular weight : 107.87 g/mol

CAS-No. : 7440-22-4
EC-No. : 231-131-3

Hazardous components

Component	Classification	Concentration
Silver		
	Aquatic Acute 1; Aquatic Chronic 1; H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Air sensitive. Handle and store under inert gas. Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Silver	7440-22-4	TWA	0.010000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.010000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.100000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Argyria		
		TWA	0.010000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.010000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.010000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.100000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Argyria		
		TWA	0.010000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Argyria		
		TWA	0.01 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	0.01 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 960 °C (1,760 °F) - lit.
f)	Initial boiling point and boiling range	2,212 °C (4,014 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available

k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	10.49 g/mL
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxygen, Strong acids and strong bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Silver/silver oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LD50 Oral - Rat - male - > 5,000 mg/kg

Inhalation: No data available

Inhalation: No data available

Dermal: No data available

Dermal: No data available

No data available

No data available

Skin corrosion/irritation
No data available

No data available

Serious eye damage/eye irritation
No data available

No data available

Respiratory or skin sensitisation
No data available

No data available

Germ cell mutagenicity
No data available

No data available

Carcinogenicity

Carcinogenicity - Rat - Unreported
Tumorigenic:Tumors at site or application.

Carcinogenicity classification not possible from current data.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

May cause argyria (a slate-gray or bluish discoloration of the skin and deep tissues due to the deposit of insoluble albuminate of silver).

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Silver)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s.

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Silver	7440-22-4	1993-04-24

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Silver	7440-22-4	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Silver	7440-22-4	1993-04-24

	CAS-No.	Revision Date
Silver	7440-22-4	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date

Silver	7440-22-4	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 05/04/2017 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 4.11
Revision Date 06/28/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Tetrachloroethylene

Product Number : 371696
Brand : Sigma-Aldrich
Index-No. : 602-028-00-4

CAS-No. : 127-18-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Perchloroethylene PCE
Formula	:	C_2Cl_4
Molecular weight	:	165.83 g/mol
CAS-No.	:	127-18-4
EC-No.	:	204-825-9
Index-No.	:	602-028-00-4

Hazardous components

Component	Classification	Concentration
Tetrachloroethylene		
	Skin Irrit. 2; Eye Irrit. 2A; Skin Sens. 1; Carc. 2; STOT SE 3; Aquatic Acute 2; Aquatic Chronic 2; H315, H317, H319, H336, H351, H411	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Tetrachloroethylene	127-18-4	TWA	25.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	100.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Potential Occupational Carcinogen Minimize workplace exposure concentrations. See Appendix A		
		See Table Z-2		
		TWA	100.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	300.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	25 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Potential Occupational Carcinogen Minimize workplace exposure concentrations. See Appendix A		
		See Table Z-2		

		TWA	100 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	25 ppm 170 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	100 ppm 685 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	25 ppm 170 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Tetrachloroethylene	127-18-4	Tetrachloroethylene	3ppm	In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	0.5000 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	3ppm	In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	0.5 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm

Break through time: 49 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -22 °C (-8 °F) - lit.
f)	Initial boiling point and boiling range	121 °C (250 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	25.3 hPa (19.0 mmHg) at 25.0 °C (77.0 °F) 17.3 hPa (13.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.623 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.15 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	log Pow: 2.53 at 23 °C (73 °F)
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available

t) Oxidizing properties No data available

9.2 Other safety information

Surface tension 32.1 mN/m at 20 °C (68 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - female - 3,385 mg/kg
(OECD Test Guideline 401)

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation
- Mouse
Result: May cause sensitisation by skin contact.
(OECD Test Guideline 429)

Germ cell mutagenicity
Hamster
ovary
Result: negative

OECD Test Guideline 474
Mouse - male
Result: negative

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC: 2A - Group 2A: Probably carcinogenic to humans (Tetrachloroethylene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Tetrachloroethylene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information

Repeated dose toxicity	Mouse - female - Oral - LOAEL : 390 mg/kg

RTECS: KX3850000

narcosis, Liver injury may occur., Kidney injury may occur.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Oncorhynchus mykiss (rainbow trout) - 5 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 7.50 mg/l - 48 h
Toxicity to algae	static test EC50 - Skeletonema costatum - > 16 mg/l - 7 h

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 11 % - Not readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 21 d - 0.00343 mg/l Bioconcentration factor (BCF): 49

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1897 Class: 6.1 Packing group: III
Proper shipping name: Tetrachloroethylene
Reportable Quantity (RQ): 100 lbsReportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1897 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TETRACHLOROETHYLENE
Marine pollutant: yes

IATA
UN number: 1897 Class: 6.1 Packing group: III
Proper shipping name: Tetrachloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

:

Reportable Quantity D039 lbs

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Tetrachloroethylene	127-18-4	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity

Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.11 Revision Date: 06/28/2017 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 4.10
Revision Date 01/04/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Trichloroethylene

Product Number : 251402
Brand : Sigma-Aldrich
Index-No. : 602-027-00-9

CAS-No. : 79-01-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear eye protection/ face protection.
P280	Wear protective gloves.
P281	Use personal protective equipment as required.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	TCE Trichloroethene
Formula	:	C_2HCl_3
Molecular weight	:	131.39 g/mol
CAS-No.	:	79-01-6
EC-No.	:	201-167-4
Index-No.	:	602-027-00-9

Hazardous components

Component	Classification	Concentration
Trichloroethylene		
	Skin Irrit. 2; Eye Irrit. 2A; Muta. 2; Carc. 1B; STOT SE 3; Aquatic Acute 3; Aquatic Chronic 3; H315, H319, H336, H341, H350, H412	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Light sensitive. Handle and store under inert gas.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Trichloroethylene	79-01-6	TWA	10.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment cognitive decrement Renal toxicity Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen		
		STEL	25.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment cognitive decrement Renal toxicity Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen		
		Potential Occupational Carcinogen See Appendix C See Appendix A		
		See Table Z-2		
		TWA	100.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		CEIL	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		Peak	300.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		TWA	100 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		CEIL	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		Peak	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		

		STEL	100 ppm 537 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	25 ppm 135 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Trichloroacetic acid	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		Trichloroethanol	0.5000 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			
		Trichloroethylene		In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			
		Trichloroethylene		In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -84.8 °C (-120.6 °F) - lit.
f)	Initial boiling point and boiling range	86.7 °C (188.1 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 10.5 %(V) Lower explosion limit: 8 %(V)
k)	Vapour pressure	81.3 hPa (61.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.463 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 2.29log Pow: 5
p)	Auto-ignition temperature	410.0 °C (770.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Strong bases, Magnesium

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 4,920 mg/kg

LC50 Inhalation - Mouse - 4 h - 8450 ppm

LD50 Dermal - Rabbit - > 20,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Severe skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Trichloroethylene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Trichloroethylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KX4550000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Exposure to and/or consumption of alcohol may increase toxic effects., Gastrointestinal disturbance, Kidney injury may occur., narcosis
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 41 mg/l - 96.0 h
	LOEC - other fish - 11 mg/l - 10.0 d
	NOEC - Oryzias latipes - 40 mg/l - 10.0 d
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 18.00 mg/l - 48 h
Toxicity to algae	IC50 - Pseudokirchneriella subcapitata (green algae) - 175.00 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
Does not bioaccumulate.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1710 Class: 6.1 Packing group: III
Proper shipping name: Trichloroethylene
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1710 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TRICHLOROETHYLENE

IATA
UN number: 1710 Class: 6.1 Packing group: III

Proper shipping name: Trichloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Trichloroethylene	79-01-6	2011-09-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Trichloroethylene	79-01-6	2011-09-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.10 Revision Date: 01/04/2018 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 4.9
Revision Date 07/27/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 1,1,1-Trichloroethane solution

Product Number : 48614
Brand : Supelco
Index-No. : 603-001-00-X

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Specific target organ toxicity - single exposure (Category 1), H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.
H370 Causes damage to organs.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P311	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Synonyms : Methyl chloroform

Molecular weight : 32.04 g/mol

Hazardous components

Component		Classification	Concentration
Methanol			
CAS-No.	67-56-1	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	90 - 100 %
EC-No.	200-659-6		
Index-No.	603-001-00-X		
Registration number	01-2119433307-44-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store at room temperature.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Headache Nausea Dizziness Eye damage		

		Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		C	1,000 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		PEL	200 ppm 260 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		
		STEL	250 ppm 325 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 30 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -98 °C (-144 °F)
f)	Initial boiling point and boiling range	64.6 - 64.7 °C (148.3 - 148.5 °F) at 1,013 hPa (760 mmHg)
g)	Flash point	11 °C (52 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 36 %(V) Lower explosion limit: 6 %(V)
k)	Vapour pressure	130.23 hPa (97.68 mmHg) at 20 °C (68 °F) 547 hPa (410 mmHg) at 50 °C (122 °F)
l)	Vapour density	No data available
m)	Relative density	0.791 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	385 °C (725 °F)
q)	Decomposition temperature	No data available

r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Acids, Oxidizing agents, Alkali metals, Acid chlorides, Acid anhydrides, Reducing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - > 1,187 - 2,769 mg/kg
Remarks: (ECHA) (Regulation (EC) No 1272/2008, Annex VI)

LDLO Oral - Human - 143 mg/kg
Remarks: Lungs, Thorax, or Respiration:Dyspnea. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

LC50 Inhalation - Rat - male and female - 4 h - 131.25 mg/l
Remarks: (ECHA) (Regulation (EC) No 1272/2008, Annex VI)

LD50 Dermal - Rabbit - 17,100 mg/kg
Remarks: (External MSDS) (Regulation (EC) No 1272/2008, Annex VI)

No data available

No data available

Skin corrosion/irritation
No data available

Skin - Rabbit
Result: No skin irritation
Remarks: (ECHA) Drying-out effect resulting in rough and chapped skin.

Serious eye damage/eye irritation
No data available

Eyes - Rabbit
Result: No eye irritation
Remarks: (ECHA) Irritation of mucous membranes

Respiratory or skin sensitisation
Maximisation Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity

No data available

Based on available data the classification criteria are not met.

Ames test
S. typhimurium
Result: negative

In vitro mammalian cell gene mutation test
fibroblast
Result: negative

OECD Test Guideline 474
Mouse - male and female - Bone marrow
Result: negative

Carcinogenicity

Did not show carcinogenic effects in animal experiments.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
No data available
Acute inhalation toxicity - Irritation symptoms in the respiratory tract.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information

Repeated dose toxicity	Rat - male and female - Inhalation - 28 d - NOAEL : 6.66 mg/l - OECD Test Guideline 412 -Subacute toxicity
	Rat - male and female - Inhalation - 365 d - NOAEL : 0.13 mg/l - LOAEL : 1.3 mg/l - OECD Test Guideline 453

RTECS: Not available

Methyl alcohol may be fatal or cause blindness if swallowed., Cannot be made non-poisonous., Effects due to ingestion may include:, Nausea, Dizziness, Gastrointestinal disturbance, Weakness, Confusion., Drowsiness, Unconsciousness, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Headache, Dizziness, Drowsiness, Coma, narcosis, Blindness, Impairment of vision, irritant effects, Nausea, Vomiting, agitation, spasms, inebriation
Drying-out effect resulting in rough and chapped skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

Toxicity to fish	flow-through test LC50 - Lepomis macrochirus (Bluegill) - 15,400.0 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - > 10,000 mg/l - 48 h Remarks: (ECHA)
	semi-static test EC50 - Daphnia magna (Water flea) - 18,260 mg/l - 96 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - ca. 22,000.0 mg/l - 96 h (OECD Test Guideline 201)
Toxicity to bacteria	EC5 - Pseudomonas fluorescens - 6,600 mg/l - 16 h Remarks: (IUCLID)
	static test IC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability

No data available

Biochemical Oxygen Demand (BOD)	600 - 1,120 mg/g Remarks: (IUCLID)
Chemical Oxygen Demand (COD)	1,420 mg/g Remarks: (IUCLID)
Theoretical oxygen demand	1,500 mg/g Remarks: (Lit.)
Ratio BOD/ThBOD	76 % Remarks: Closed Bottle test(IUCLID)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

Additional ecological information	Avoid release to the environment.
Stability in water	at 19 °C83 - 91 % - 72 h Remarks: Hydrolyses on contact with water.Hydrolyses readily.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol
Reportable Quantity (RQ): 5000 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL

IATA
UN number: 1230 Class: 3 (6.1) Packing group: II
Proper shipping name: Methanol

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
1,1,1-Trichloroethane	71-55-6	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol	67-56-1	2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.
STOT SE	Specific target organ toxicity - single exposure

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.9 Revision Date: 07/27/2018 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 6.0
Revision Date 05/25/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 1,1,2-Trichloroethane

Product Number : 46262
Brand : Sigma-Aldrich
Index-No. : 602-014-00-8

CAS-No. : 79-00-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302

Acute toxicity, Inhalation (Category 3), H331

Acute toxicity, Dermal (Category 4), H312

Carcinogenicity (Category 2), H351

Acute aquatic toxicity (Category 3), H402

Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word	Danger
Hazard statement(s)	
H302 + H312	Harmful if swallowed or in contact with skin.
H331	Toxic if inhaled.
H351	Suspected of causing cancer.
H412	Harmful to aquatic life with long lasting effects.
Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P311	Call a POISON CENTER /doctor.
P322	Specific measures (see supplemental first aid instructions on this label).
P330	Rinse mouth.
P363	Wash contaminated clothing before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_2H_3Cl_3$
Molecular weight	:	133.40 g/mol
CAS-No.	:	79-00-5
EC-No.	:	201-166-9
Index-No.	:	602-014-00-8

Hazardous components

Component	Classification	Concentration
1,1,2-Trichloroethane		
	Acute Tox. 4; Acute Tox. 3; Acute Tox. 4; Carc. 2; Aquatic Acute 3; Aquatic Chronic 3; H302 + H312, H331, H351, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,1,2-Trichloroethane	79-00-5	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Liver damage Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	10 ppm 45 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix C See Appendix A Potential for dermal absorption		
		TWA	10 ppm 45 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation The value in mg/m3 is approximate.		
		PEL	10 ppm 45 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 60 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls.

If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-37.0 °C (-34.6 °F)
f)	Initial boiling point and boiling range	110 - 115 °C (230 - 239 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.435 g/cm3 at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong bases, Strong oxidizing agents, Reacts violently with:, Sodium/sodium oxides, Potassium, Magnesium, Aluminum

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 836.0 mg/kg
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Severe skin irritation - 24 h
Skin - Rabbit
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification. The National Cancer Institute (NCI) has found clear evidence for carcinogenicity.
Limited evidence of carcinogenicity in animal studies

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KJ3150000

Central nervous system depression, prolonged or repeated exposure can cause:, narcosis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Lepomis macrochirus (Bluegill) - 40.00 mg/l - 96 h(1,1,2-Trichloroethane)
	LC50 - Pimephales promelas (fathead minnow) - 81.60 mg/l - 96 h(1,1,2-Trichloroethane)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 43.00 mg/l - 48 h(1,1,2-Trichloroethane)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(1,1,2-Trichloroethane)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2810 Class: 6.1 Packing group: III
Proper shipping name: Toxic, liquids, organic, n.o.s. (1,1,2-Trichloroethane)
Reportable Quantity (RQ) : 100 lbs

no
Poison Inhalation Hazard: No

IMDG
UN number: 2810 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC LIQUID, ORGANIC, N.O.S. (1,1,2-Trichloroethane)

IATA
UN number: 2810 Class: 6.1 Packing group: III
Proper shipping name: Toxic liquid, organic, n.o.s. (1,1,2-Trichloroethane)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,1,2-Trichloroethane	79-00-5	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,1,2-Trichloroethane	79-00-5	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,1,2-Trichloroethane	79-00-5	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,1,2-Trichloroethane	79-00-5	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
1,1,2-Trichloroethane	79-00-5	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H302	Harmful if swallowed.
H302 + H312	Harmful if swallowed or in contact with skin.
H312	Harmful in contact with skin.
H331	Toxic if inhaled.
H351	Suspected of causing cancer.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 05/25/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 5.8
Revision Date 10/12/2015
Print Date 05/01/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Zinc
Product Number	:	96454
Brand	:	Sigma-Aldrich
CAS-No.	:	7440-66-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052

1.4 Emergency telephone number

Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Combustible dust,
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word: Warning

Hazard statement(s)

	May form combustible dust concentrations in air
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P273	Avoid release to the environment.
P391	Collect spillage.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : Zn
Molecular weight : 65.39 g/mol

Hazardous components

Component		Classification	Concentration
Zinc powder (stabilized)			
CAS-No. EC-No. Index-No.	7440-66-6 231-175-3 030-001-01-9	Aquatic Acute 1; Aquatic Chronic 1; H410	<= 100 %
Zinc oxide			
CAS-No. EC-No. Index-No.	1314-13-2 215-222-5 030-013-00-7	Aquatic Acute 1; Aquatic Chronic 1; H410	>= 5 - < 10 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Special powder against metal fire Dry sandUse water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media
Water

5.2 Special hazards arising from the substance or mixture

Zinc/zinc oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.
Storage class (TRGS 510): Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Zinc oxide	1314-13-2	TWA	2.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	metal fume fever		
		STEL	10.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		metal fume fever		

		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	15.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	15.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey
b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	Not applicable
e)	Melting point/freezing point	Melting point/range: 420 °C (788 °F) - lit.
f)	Initial boiling point and boiling range	907 °C (1,665 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	May form combustible dust concentrations in air
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	Not applicable
l)	Vapour density	No data available
m)	Relative density	7.133 g/mL at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	Not applicable
p)	Auto-ignition temperature	does not ignite
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	During processing, dust may form explosive mixture in air.
t)	Oxidizing properties	No data available

9.2 Other safety information

Bulk density	1.8 - 3.2 kg/m3

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Dust may form explosive mixture in air.

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Acids and bases

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available (Zinc powder (stabilized))

Inhalation: No data available (Zinc powder (stabilized))

Dermal: No data available (Zinc powder (stabilized))

No data available (Zinc powder (stabilized))

Skin corrosion/irritation
No data available (Zinc powder (stabilized))

Serious eye damage/eye irritation
No data available (Zinc powder (stabilized))

Respiratory or skin sensitisation
Did not cause sensitisation on laboratory animals. (Zinc powder (stabilized))

Germ cell mutagenicity
No data available (Zinc powder (stabilized))

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available (Zinc powder (stabilized))

No data available (Zinc powder (stabilized))

Specific target organ toxicity - single exposure
No data available (Zinc powder (stabilized))

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available (Zinc powder (stabilized))

Additional Information
RTECS: ZG8600000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Effects due to ingestion may include:, chills, dry throat, sweet taste, Fever, Cough, Nausea, Vomiting, Weakness, Contact with eyes or skin may cause:, Irritation (Zinc powder (stabilized))

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Cyprinus carpio (Carp) - 450 µg/l - 96 h (Zinc powder (stabilized))
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 0.068 mg/l - 48 h (Zinc powder (stabilized))
	mortality NOEC - Daphnia (water flea) - 0.101 - 0.14 mg/l - 7 d (Zinc powder (stabilized))

12.2 Persistence and degradability

The methods for determining the biological degradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Bioaccumulation	Algae - 7 d at 16 °C - 5 µg/l (Zinc powder (stabilized))
	Bioconcentration factor (BCF): 466

12.4 Mobility in soil

No data available (Zinc powder (stabilized))

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Zinc powder (stabilized))
Reportable Quantity (RQ): 1020 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc powder (stabilized))
Marine pollutant:yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Zinc powder (stabilized))

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Zinc oxide	1314-13-2	2007-03-01
Zinc powder (stabilized)	7440-66-6	1993-04-24

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Zinc powder (stabilized)	7440-66-6	1993-04-24
Zinc oxide	1314-13-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Zinc powder (stabilized)	7440-66-6	1993-04-24
Zinc oxide	1314-13-2	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Zinc powder (stabilized)	7440-66-6	1993-04-24
Zinc oxide	1314-13-2	2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

	May form combustible dust concentrations in air
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 10/12/2015 Print Date: 05/01/2016

APPENDIX E

Quality Assurance Project Plan

Quality Assurance Project Plan

Cottage-Garden Auto Repair Site
30 Garden Street and 16 Cottage Place
New Rochelle, New York
(BCP# C360180)

1.0 PROJECT DESCRIPTION

This document presents the Quality Assurance Project Plan (QAPP) for the Remedial Investigation Workplan (RIWP) for the Cottage Place and Garden Street property in the City of New Rochelle, New York (Site). The Site includes Parcels 3-802-0032; 3-802-0036; and 3-802-0038. The properties total approximately 0.98-acres and have been historically been utilized for residential and commercial purposes. Figure 2.1 presents a Site Location Map.

The Site comprises four commercial buildings and one residential building. The combined parcels comprise approximately three quarters acres of land. The residential parcel on Cottage Place is a two and one-half story apartment building with approximately 1,000 sq. ft. of occupied space. The residence was constructed as a residential single-family home in the early 1900's, with conversion to multiple apartments over the years, based on information from available records. The 16 Cottage Place is a single-story masonry structure with approximately 1,200 sq. ft. of floor area used for a Kitchen and Bath dealer and other similar warehousing purposes. The property at 10 – 12 Cottage Place is a retail tire and auto repair facility present on the site for over 60 years. The property was once a gasoline station with underground tanks currently in place and prior uses are unknown. 28 Garden Street and 34 Garden Street are commercial properties with retail uses documented over the years. 26 Garden Street is a commercial property which was occupied with Plastic Works manufacturing and by Strip-A-Way of New Rochelle Inc. Figure 2.2 presents a Site Plan.

2.0 PROJECT ORGANIZATION

The RIWP will be conducted by Soils Engineering Services, Inc. (SESI), on behalf of The Mark 95 LLC and The Mark 95 II LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below.

2.1 Project Principal

Michael W. St. Pierre, P.E.
Provide technical and administrative oversight and guidance throughout the project, assist in securing company resources, participate in technical review of deliverables, and attend key meetings as needed.

2.2 Principal Engineer

Fuad Dahan, PhD, P.E.
Provide technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3 Project Manager

Steven Gustems, PG

Responsible for maintaining the day-to-day schedule for completing the fieldwork and deliverables according to BCP program requirements and client expectations.

2.4 Remedial Investigation Program Manager

Fuad Dahan, PhD, P.E.
Responsible for coordinating and directing field efforts of SESI staff and subcontractors, and for maintaining that work is done according to QAPP specifications.

2.5 Field Team Leader

Joseph Scardino
Responsible for overseeing field work during the RI and IRM, including observing subcontractors, maintaining field notes, and collecting samples of various environmental media, in accordance with the NYSDEC-approved Work Plan.

3.0 QA/QC OBJECTIVES FOR MEASUREMENT OF DATA

Sample Collection
The chemical constituents anticipated to be sampled and their analytical methods are listed in Table 7-1. In addition to the collection of investigative field samples, requirements and procedures for the collection of field QA/QC samples for the Site will be adhered to as discussed below:

Duplicate Samples: The NYSDEC specifies a duplicate sample frequency requirement of 20% (1 duplicate per 20 investigative samples of a given matrix). Duplicates will be analyzed for the same parameters as the original investigative sample. The time of duplicate sample collection will not be recorded on any documents, jars, labels, or other equipment that is to be submitted to the laboratory performing the sample analysis; instead, the duplicate sample information is to be recorded by the field personnel in the project field notes for reference. The analytical results of the duplicate will be used to check for analytical and sampling reproducibility, which is to measure the precision of laboratory methods and instrumentation, in addition to the precision of field sample collection methods employed.

Field and Trip Blanks: Field and trip blanks consisting of distilled water will be submitted to the analytical laboratory to provide the means to assess the quality of the data resulting from the field-sampling program. Field (equipment) blank samples will be analyzed to check for procedural chemical constituents at the facility that may cause sample contamination. One (1) field blank will be collected for every 20 or fewer investigative samples of a given matrix and will be analyzed for the total amount of parameters to be sampled during the sampling event. Trip blanks will be used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage. One (1) trip blank will be included with each shipment container storing at least one (1) aqueous sample collected and proposed for volatile organic compound analysis. Each trip blank will be submitted for volatile organic compound analysis.

Matrix Spike / Matrix Spike Duplicates (MS/MSD): MS/MSD and MS/Duplicate samples provide information about the effect of the sample matrix on the digestion and measurement methodology. Depending on site-specific circumstances, one MS/MSD or MS/Duplicate should be collected for every 20 or fewer investigative samples to be analyzed for organic and inorganic parameters of a given matrix.

Sample Preservation

Effective sample preservation methods increase the prevention for degradation of a sample due to precipitation, biological action, or other physical/chemical processes between the time of sample collection and analysis. Prior to sample collection in the field, all sample bottleware must be checked to ensure the proper sample containerization is provided from the laboratory for the respective sample parameters to be collected. Table 4.1 provides sample containerization elements to be referenced with the objective of achieving the proper collection and preservation of samples in accordance to their proposed laboratory method to be performed. Containerization elements to be considered include the sample analysis method by matrix, quantity of containers required for proposed analysis, the size and material construction of bottleware, the requirement for temperature-based and/or chemical preservatives to be present within select sample containers based on proposed laboratory analysis, and the consideration of parameter-specific sample holding times that must not be exceeded for collected samples awaiting delivery, processing, and extraction at the laboratory. Section 4.4 provides additional information on sample preservation and shipment.

Sample preservation must be documented on the Chain-of-Custody form either using codes provided by the laboratory or written notes.

In cases where NYSDOH ELAP Certification exists for a specific group or category of parameters, the laboratories performing analysis in connection with this project will have appropriate NYSDOH ELAP Certification.

Detection limits set by NYSDEC-ASP (July 2005) will be used for all sample analyses unless otherwise noted. If NYSDEC-ASP-dictated detection limits prove insufficient to assess project goals (i.e., comparison to drinking water standards or attainment of ARARs), then ASP Special Analytical Services (SAS) or other appropriate methods will be utilized.

The quality assurance/quality control objectives for all measurement data include completeness, representativeness, comparability, precision and accuracy.

3.1 COMPLETENESS

The analyses performed must be appropriate and inclusive. The parameters selected for analysis are chosen to meet the objectives of the study.

Completeness of the analyses will be assessed by comparing the number of parameters intended to be analyzed with the number of parameters successfully determined and validated. Data must meet QC acceptance criteria for 100 percent or more of requested determinations.

3.2 REPRESENTATIVENESS

Samples must be taken of the population and, where appropriate, the population will be characterized statistically to express the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process, or environmental condition.

Non-dedicated sampling devices will be cleaned between sampling points by washing and rinsing with pesticide-grade methanol, followed by a thorough rinse with distilled water. Specific cleaning techniques are described in the Field Sampling Procedure. Two types of blank samples will accompany each sample set where Target Compound List (TCL) volatiles are to be analyzed

(water matrix only). A trip blank, consisting of a 40 ml VOA vial of organic-free water prepared by the laboratory, will accompany each set of sample bottles from the laboratory to the field and back. This bottle will remain sealed throughout the shipment and sampling process. This blank will be analyzed for TCL volatile organic compounds along with the groundwater samples to ensure that contamination with TCL volatile compounds has not occurred during the bottle preparation, shipment and sampling phase of the project. In order to check for contaminant carryover when non-dedicated sampling equipment is used, a rinsate blank will be submitted to the laboratory. This blank will also be analyzed for TCL volatile organic compounds. The TCL compounds are identified in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program dated 7/85 or as periodically updated.

The analysis results obtained from the determination of identical parameters in field duplicate samples can be used to further assess the representativeness of the sample data.

3.3 COMPARABILITY

Consistency in the acquisition, preparation, handling and analysis of samples is necessary in order for the results to be compared where appropriate. Additionally, the results obtained from analyses of the samples will be compared with the results obtained in previous studies, if available.

To ensure the comparability of analytical results with those obtained in previous or future testing, all samples will be analyzed by NYSDEC-approved methods. The NYSDEC-ASP mandated holding times for various analyses will be strictly adhered to.

3.4 PRECISION AND ACCURACY

The validity of the data produced will be assessed for precision and accuracy. Analytical methods which will be used include gas chromatography/mass spectrometry (GC/MS), gas chromatography (GC), colorimetry, atomic spectroscopy, gravimetric and titrametric techniques. The following outlines the procedures for evaluating precision and accuracy, routine monitoring procedures, and corrective actions to maintain analytical quality control. All data evaluations will be consistent with NYSDEC-ASP procedures (July 2005). Data will be 100 percent compliant with NYSDEC-ASP requirements.

The requirements of QA/QC are both method specific and matrix dependent. The number of duplicate, spiked and blank samples analyzed will be dependent upon the total number of samples of each matrix to be analyzed, but there will be at least one split per matrix with a minimum of 1 per every 20 samples. The inclusion and frequency of analysis of field blanks and trip blanks will be on the order of one per each site. Samples to be analyzed for volatile organic compounds will be accompanied by trip and field blanks (water matrix) or field blanks (soil, sediment matrice).

Quality assurance audit samples will be prepared and submitted by the laboratory QA manager for each analytical procedure used. The degree of accuracy and the recovery of analyte to be expected for the analysis of QA samples and spiked samples is dependent upon the matrix, method of analysis, and compound or element being determined. The concentration of the analyte relative to the detection limit is also a major factor in determining the accuracy of the measurement. The lower end of the analytical range for most analyses is generally accepted to be five times the detection limit. At or above this level, the determination and spike recoveries for metals in water samples will be expected to range from 75 to 125 percent. The recovery of organic surrogate compounds and matrix spiking compounds determined by GC/MS will be compared to the guidelines for recovery of individual compounds as established by the United

States Environmental Protection Agency Contract Laboratory Program dated 7/85 or as periodically updated.

The quality of results obtained for inorganic ion and demand parameters will be assessed by comparison of QC data with laboratory control charts for each test.

4.0 SAMPLING PROCEDURES

4.1 SAMPLING PROGRAM

The sampling program for this project will include soil and groundwater. Soil samples will be collected from split spoon sampling or macrocore devices retrieved from soil borings. Groundwater samples will be collected from groundwater monitoring wells using low flow purging techniques.

4.1.1 Drilling/Sampling Procedures

Soil and groundwater samples will be collected by means of a soil boring program. Soil borings shall be completed using the hollow stem auger drilling methods, direct push methods, or rotary drilling methods, whichever methods are determined to be best suited to site conditions by the SESI project manager and SESI field team leader.

Soil samples will be collected from soil borings and analyzed in accordance with the NYSDEC-approved Work Plan. Monitoring wells for groundwater sample collection will be installed in completed soil borings. Either hollow stem auger (HSA) or direct push drilling methods may be utilized for monitoring well completion.

Samples of the encountered surface materials shall be collected continuously during drilling so that a complete soil profile is examined and described by the SESI field geologist. The sampling method employed shall be ASTM D-1586/Split Barrel Sampling using a standard 2-foot long, 2-inch outside diameter split- spoon sampler with a 140-pound hammer, in cases where HSA methods are used. Upon retrieval of the sampling barrel, the collected sample shall be placed in glass jars and labeled, stored on site (on ice in a cooler if necessary), and transmitted to the appropriate testing laboratory or storage facility. Chain-of-custody procedures will be practiced following Section 15, EPA-600/4-82-029, Handbook for Sampling and Sample Preservation of Water and Waste Waters.

A geologist or engineer will be on site during the drilling operations to fully describe each soil sample, following the New York State Soil Description Procedure, and to retain representative portions of each sample.

The drilling contractor will be responsible for obtaining accurate and representative samples, informing the geologist of changes in drilling pressure, keeping a separate general log of soils encountered including blow counts [i.e., the number of blows from a soil sampling drive weight (140 pounds)] required to drive the split-spoon sampler in 6-inch increments and installing monitoring wells to levels directed by the supervising geologist following specifications further outlined in this protocol.

4.1.2 Monitoring Well Completion

Monitoring wells will be constructed of 0.010-inch slot size PVC well screen and riser casing. Other materials utilized for completion will be washed silica sand (Q-Rock No. 4 or approved equivalent) bentonite grout, Portland cement, and a protective steel locking well casing and cap

with locks. The depth of the wells will be determined based on the depth to water and field conditions encountered.

The monitoring well installation method for wells installed within unconsolidated sediments shall be to place the screen and riser assembly into the casing once the screen interval has been selected. At that time, a washed silica sand pack will be placed around the well screen if required to prevent screen plugging. If a sand pack is not warranted, the auger string will be pulled back to allow the native aquifer material to collapse 2 to 3 feet above the top of the screen. Bentonite pellets will then be added to the annulus between the casing and the inside auger to insure proper sealing. Cement/bentonite grout will continue to be added during the extraction of the augers until the entire aquifer thickness has been sufficiently sealed off from horizontal and/or vertical flow above the screened interval. During placement of sand and bentonite pellets, frequent measurements will be made to check the height of the sand pack and thickness of bentonite layers by a weighted drop tape measure.

A bolt-down protective curb box will be installed, flush with the ground, or steel "stick-up" protective casing and secured by a Portland cement seal. The cement seal shall extend laterally at least 1 foot in all directions from the protective casing and shall slope gently away to drain water away from the well.

4.1.3 Well Development

All monitoring wells will be developed or cleared of all fine-grained materials and sediments that have settled in or around the well during installation so that the screen is transmitting representative portions of the groundwater. The development will be by one of two methods, pumping or bailing groundwater from the well until it yields relatively sediment-free water.

A decontaminated pump or bailer will be used and subsequently decontaminated after each use following procedures outlined in the Decontamination Protocol. Pumping or bailing will cease when the turbidity falls below 50 NTUs or until specific conductivity, pH, and temperature are stable (i.e., consecutive readings are within 10 percent with no overall upward or downward trends in measurements). Well development water will be disposed of on the ground surface at each well location or contained in drums as conditions warrant.

4.1.4 Decontamination

All drilling equipment and associated tools including augers, drill rods, sampling equipment, wrenches and any other equipment or tools that have come in contact with contaminated materials will be decontaminated before any drilling on site begins, between each well, and prior to removing any equipment from the site. The preferred decontamination procedure will be to use a high pressure steam cleaner to remove soils and volatile organics from the equipment. The water used for this procedure will be contained and shall come from a controlled source, preferably a municipal drinking supply. Representative samples of the contained decontamination water and well development water will be screened in the field to determine the proper method of disposal. Every effort will be made to minimize the generation of contaminated water.

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4.2 Groundwater Sampling Program.

4.2.1 Well Evacuation

Prior to sampling a monitoring well, the static water level will be recorded. All well data will be recorded on a field sampling record. The wells will be sampled in accordance with the USEPA guidelines for the Low Flow Purging Sampling (LFPS). The purpose of LFPS is to collect groundwater samples from monitoring wells that are representative of ambient groundwater conditions in the aquifer. The LFPS method reduces turbidity which is needed particularly when sampling for metals.

4.2.2 Sampling Procedure

The wells will be sampled using the LFPS technique. A flow rate of 100 ml to 250 ml per minute is used to purge the wells. Drawdown should not exceed 0.3 feet. QED bladder pumps are used for this method. The pump intake is lowered to the mid-point of the water column. At the initiation of low flow purging a water level is recorded as well as field parameters. Field parameters are then monitored every five minutes during low flow purging using a flow through cell. When three consecutive measurements of pH differ by 0.1 units or less, with ORP within 10 mv or less, turbidity varies 10 percent or less, conductivity differs by 3 percent or less and dissolved oxygen by 10 percent or less, sampling may begin. Flow through cells are used so continuous real time readings are made. When the parameters stabilize the flow through cell is disconnected and sample bottles are filled directly from the tubing.

In addition to water samples collected from the monitoring wells, two types of "blanks" will be collected and submitted to the chemical laboratory for analyses. The blanks will consist of 40 ml VOA vials, as follows:

A trip blank will be prepared before the sample bottles are sent by the laboratory. It consists of a sample of distilled, deionized water which accompanies the other sample bottles into the field and back to the laboratory. A trip blank will be included with each shipment of samples where sampling and analysis for TCL volatiles is planned (water matrix only). The trip blank will be analyzed for TCL volatile organic compounds as a measure of the internal laboratory procedures and their effect on the results.

4.3 Soil Vapor Sampling

Soil vapor sampling will be conducted in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006). Soil vapor samples will be collected in the vadose zone from shallow vapor probes installed either between 1 to 2 feet below impervious surfaces such as concrete or asphalt (sub-slab samples), or from vapor probes with a minimum distance of 3 feet below atmosphere-permeable surfaces to be sealed above the installed vapor probe to prevent atmospheric interference. In addition, indoor air samples may be collected within building interiors to evaluate ambient air conditions representative of selected locations within the building.

Each soil vapor point will be installed in a boring drilled either by hand-operated equipment (e.g. hand auger or percussion hammer drill), or by a small truck-mounted drill rig. Drilling equipment used shall be based on soil conditions, and the method that provides the most practical approach.

Each soil vapor point will consist of an inert sampling tube (polyethylene, stainless steel, or Teflon®) attached with a probe tip at the bottom through which soil vapors can be sampled. Each

designated soil vapor sampling location will be purged of a minimum of three volumes using a low volume pump, and then attached to a regulator, and secured with a clamp. The regulator will then be attached to a 1-liter summa canister.

The regulator will be set to collect a soil vapor sample at a flow rate of no less than 0.2 liters per minute. After the summa canister is filled, the valve will be closed.

Each canister will be listed according to a specific sample I.D. on a chain-of-custody form. Sample canisters will be delivered to the laboratory within 24 hours, and analyzed for VOCs by EPA method TO-15. The detection limit for VOCs will be 1 μg/m3 or less.

The soil vapor sampling effort will include the use inert helium tracer gas to verify that the soil vapor samples are not diluted by ambient air. The atmosphere around the sampling tube will be enriched with the tracer gas, and the soil vapor sample will be collected in the presence of the enriched tracer atmosphere. This will be accomplished by placing an inverted plastic pail over the sampling point and filling the pail with the tracer gas via a small tube penetrating the site of the pail. Refer to NYSDOH Guidance for Evaluating Indoor Air Intrusion in New York State (October 2006).

Weather conditions in the 48 hours prior to the test, and during the test, will be noted, including average wind speed, precipitation, temperature, and barometric pressure.

4.4 SAMPLE PRESERVATION AND SHIPMENT

Since all bottles will contain the necessary preservatives as shown in Table 4.1, they need only be filled. The 40 ml VOA vials must be filled to the container brim with no air bubbles present. The other bottles should be filled to within about 1 inch from the top.

The bottles will be sent from the laboratory in coolers which will be organized on a per site basis. Following sample collection, the bottles should be placed on ice in the shipping cooler. The samples will be cooled to 4°C, but not frozen. Final packing and shipment of coolers will be performed in accordance with ASP guidelines.

5.0 SAMPLE CUSTODY

The program for sample custody and sample transfer is in compliance with the NYSDEC-ASP, as periodically updated. If samples may be needed for legal purposes, chain-of-custody procedures, as defined by NEIC Policies and Procedures (USEPA-330/9-78-001-R, Revised June 1988) will be used. Sample chain-of-custody is initiated by the laboratory with selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized.

5.1 FIELD SAMPLE CUSTODY

A chain-of-custody record accompanies the sample from initial sample container selection and preparation at the laboratory, shipment to the field for sample containment and preservation, and return to the laboratory. Two copies of this record follow the samples to the laboratory. The laboratory maintains one file copy and the completed original is returned to the site inspection team. Individual sample containers provided by the laboratory are used for shipping samples. The shipping containers are insulated and chemical or ice water is used to maintain samples at approximately 4°C until samples are returned and in the custody of the laboratory. All sample bottles within each shipping container are individually labeled and controlled. Samples are to be shipped to the laboratory within 24-48 hours of the day of collection.

Each sample shipping container is assigned a unique identification number by the laboratory. This number is recorded on the chain-of-custody record and is marked with indelible ink on the outside of the shipping container. The field sampler will indicate the sample designation/location number in the space provided on the appropriate chain-of-custody form for each sample collected. The shipping container is closed and a seal provided by the laboratory is affixed to the latch. This seal must be broken to open the container, and this indicates possible tampering if the seal is broken before receipt at the laboratory. The laboratory will contact the site investigation team leader and the sample will not be analyzed if tampering is apparent.

5.2 LABORATORY SAMPLE CUSTODY

The site investigation team leader or Project Quality Assurance Officer notifies the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The laboratory sample program meets the following criteria:

1. The laboratory has designated a sample custodian who is responsible for maintaining custody of the samples and for maintaining all associated records documenting that custody.
2. Upon receipt of the samples, the custodian will check the original chain-of-custody documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian signs the chain-of-custody record and records the date and time received.
3. Care is exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the site investigation team leader as part of the corrective action process. A qualitative assessment of each sample container is performed to note any anomalies, such as broken or leaking bottles. This assessment is recorded as part of the incoming chain-of-custody procedure.
4. The samples are stored in a secured area at a temperature of approximately 4°C until analyses are to commence.
5. A laboratory chain-of-custody record accompanies the sample or sample fraction through final analysis for control.
6. A copy of the chain-of-custody form will accompany the laboratory report and will become a permanent part of the project records.

5.3 FINAL EVIDENCE FILES

Final evidence files include all originals of laboratory reports and are maintained under documented control in a secure area.

A sample or an evidence file is under custody if:

- It is in your possession; it is in your view, after being in your possession.
- It was in your possession and you placed it in a secure area.
- It is in a designated secure area.

6.0 CALIBRATION PROCEDURES

Instruments and equipment used to gather, generate or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of

results are consistent with the appropriate manufacturer's specifications or project specific requirements. The procedures for instrument calibration, calibration verification, and the frequency of calibrations are described in the NYSDEC-ASP. The calibration of instruments used for the determination of metals will be as described in the appropriate ASP standard operating procedures.

Calibration of other instruments required for measurements associated with these analyses will be in accordance with the manufacturer's recommendations and the standard operating procedures of the laboratory.

7.0 ANALYTICAL PROCEDURES

Analytical procedures shall conform to the most recent revision of the NYSDEC-ASP (July 2005) and are summarized on Table 7.1. In the absence of USEPA or NYSDEC guidelines, appropriate procedures shall be submitted for approval by NYSDEC prior to use.

The procedures for the sample preparation and analysis for organic compounds are as specified in the NYSDEC-ASP. Analytical cleanups are mandatory where matrix interferences are noted. No sample shall be diluted any more than 1 to 5. The sample shall be either re-extracted, re-sonicated, re-stream distilled, etc. or be subjected to any one analytical cleanup noted in SW846 or a combination thereof. The analytical laboratory shall expend such effort and discretion to demonstrate good laboratory practice and demonstrate an attempt to best achieve the method detection limit.

7.1 VOLATILE ORGANICS (VOA)

For the analysis of water samples for Target Compound List (TCL), volatile organic compounds (VOCs), no sample preparation is required. The analytical procedure for volatiles is detailed in NYSDEC-ASP (Volume I, Section D-I). A measured portion of the sample is placed in the purge and trap apparatus and the sample analysis is performed by gas chromatography/mass spectrometry for the first round. USEPA Method 8260 will be used, plus tentatively identified compounds (TICs). USEPA Methods 8010 or 8020 (gas chromatography with different detectors) will be used if subsequent rounds with lower limits of detection are warranted.

7.2 SEMI-VOLATILE ORGANIC COMPOUNDS

The extraction and analytical procedures used for preparation of water, soil and sediment samples for the analysis of the TCL semi-volatile organic compounds are described in NYSDEC-ASP Volume I, Section D-III. USEPA Method 8270 will be used, plus tentatively identified compounds (TICs).

Instrument calibration, compound identification, and quantitation are performed as described in Section 6 of this document and in the NYSDEC-ASP.

7.3 PESTICIDE AND PCB COMPOUNDS

The sample preservation procedures for gas chromatography for pesticides and PCB's will be as described in the NYSDEC-ASP methods (Section D-IV). The analysis of standard mixes, blanks and spiked samples will be performed at the prescribed frequency with adherence to the 72-hour requirement described in the method.

7.4 METALS

Water, soil and waste samples will be analyzed for the metals listed in Table 7.1. The detection limits for these metals are as specified in the NYSDEC-ASP, Section D-V. The instrument

detection limits will be determined using calibration standards and procedures specified in the NYSDEC-ASP. The detection limits for individual samples may be higher due to the sample matrix. The procedures for these analyses will be as described in the NYSDEC-ASP. The extraction and analytical procedures used for preparation of water, soil and sediment samples for the analysis of the TAL metals will be performed in accordance with EPA solid waste methods 6010, 6020, 7470, and 7471. Analysis for cyanide will be performed in accordance with EPA Method 9010/9014.

The analyses for metals will be performed by atomic absorption spectroscopy (AAS) or inductively-coupled plasma emission spectroscopy (ICPES), as specified in the ASP with regard to AAS flame analysis.

7.5 SITE SPECIFICITY OF ANALYSES

Work plans prepared for remedial investigation waste sites contain recommendations for the chemical parameters to be determined for each site. Thus, some or all of the referenced methods will apply to the analysis of samples collected at the individual waste sites. Analyses of Target Compound List (TCL) analytes will be performed on all samples.

TABLE 4.1 – SAMPLE CONTAINERIZATION

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE(1)	HOLDING TIME
Aqueous Samples				
SVOCs (BNAs) – USEPA 8270C	2	1-liter amber glass bottle	None	7 days (until extraction) 40 days (extracted)
Pesticides – USEPA 8081A	2	1-liter amber glass bottle	None	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082	2	1-liter amber glass bottle	None	7 days (until extraction) 40 days (extracted)
VOCs – USEPA 8260B	2	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2	14 days
Metals(2)	1	1-liter, plastic bottle	Nitric acid to pH <2	180 days Mercury: 28 days
Cyanide – SM 4500-CN-E	1	1-liter, plastic	Sodium Hydroxide to pH >12	14 days
Soil, Sediment, Solid Waste Samples				
VOCs – USEPA 8260B	3	15-gram EnCore samplers	None	14 days
SVOCs (BNAs) – USEPA 8270C	1	4-oz. glass jar with Teflon lid	None	7 days (until extraction, 40 days extracted)
Pesticides – USEPA 8081A	1	4-oz. glass jar with Teflon lid	None	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082	1	4-oz. glass jar with Teflon lid	None	7 days (until extraction) 40 days (extracted)
Metals(2)	1	4-oz. glass jar with Teflon lid	None	180 days Cyanide: 14 days Mercury: 28 days
Soil Vapor / Indoor Air Samples				
VOCs – USEPA TO-15	1	Summa Canister	None	30 days

(1) All samples will be preserved with ice during collection and shipment.
(2) Metals refers to the 24 metals and cyanide in the Target Compound List.

TABLE 4.2 – SAMPLING PROCEDURE FOR MONITORING WELLS

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.

2. Sampling device and electric contact probe decontaminated.
    a. Sampling device and probe are rinsed with pesticide-grade methanol and distilled water.
    b. Methanol is collected into a large funnel which empties into a five- gallon container.

3. Sampling device lowered into well.
    a. Bailer lowered by dedicated PVC or polypropylene line.

4. Sample taken.
    a. Sample is poured slowly from the open end of the bailer and the sample bottle tilted so that aeration and turbulence are minimized.
    b. Duplicate sample is collected when appropriate.

5. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.

6. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.
    a. Dedicated line is disposed of or left at well site.

7. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.

8. Chain-of-custody forms are completed in triplicate.
    a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler.

9. The original will be returned following sample analysis.
    a. A second carbon copy is kept on file.

10. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

TABLE 4.3 – SAMPLING PROCEDURE FOR MONITORING WELLS USING LOW-STESS (LOW-FLOW) METHODS

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.

2. Sampling device is lowered into well. Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well. Pump intake must be no less than 2 feet from the bottom of the well to prevent disturbance and resuspension of sediments which may be at the bottom of the well.

3. Measure water level again: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

4. Purge Well: Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

5. Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):

    a. 0.1 for pH
    b. 3% for specific conductance (conductivity)
    c. 10 mv for redox potential
    d. 10% for DO and turbidity

6. Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

7. Collect Samples: Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.

8. Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary. If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and equal volume of water (e.g., 40 ml). Groundwater purged from the well prior to sampling can be used for this purpose.

9. Remove Pump and Tubing: After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

10. Measure and record well depth.

11. Close and lock the well.

12. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.

13. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.

    a. Dedicated line is disposed of or left at well site.

14. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.

15. Chain-of-custody forms are completed in triplicate.

    a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler. The original will be returned following sample analysis.
    b. A second carbon copy is kept on file.

16. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

TABLE 7-1 – CONTRACT-REQUIRED QUANTITATION LEVELS AND ANALYTICAL METHODS FOR ASP INORGANICS, ASP VOLATILES, ASP SEMI-VOLATILES, ASP PESTICIDES, AND PCBS

Superfund Target Compound List (TCL) and Contract-Required Quantitation Limit

SECTION 1 - ASP INORGANICS Method: NYSDEC-ASP-91-4					
	PARAMETER	**CONTRACT-REQUIRED DETECTION LEVEL* (µg/L)**		**PARAMETER**	**CONTRACT-REQUIRED DETECTION LEVEL* (µg/L)**
1.	Aluminum	200	13.	Magnesium	5,000
2.	Antimony	60	14.	Manganese	15
3.	Arsenic	15	15.	Mercury	0.2
4.	Barium	200	16.	Nickel	40
5.	Beryllium	5	17.	Potassium	5,000
6.	Cadmium	5	18.	Selenium	35
7.	Calcium	5,000	19.	Silver	10
8.	Chromium	10	20.	Sodium	5,000
9.	Cobalt	50	21.	Thallium	25
10.	Copper	25	22.	Vanadium	50
11.	Iron	100	23.	Zinc	60
12.	Lead	10	24.	Cyanide	10

SECTION 2 – ASP ORGANICS (VOLATILES) Method: NYSDEC-ASP-91-1					
	VOLATILE	**CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)**		**VOLATILE**	**CONTRACT-REQUIRED QUANTITATION LIMIT** (µg/L)**
1.	Chloromethane	5.0	18.	1,2-Dichloropropane	5.0
2.	Bromomethane	5.0	19.	cis-1,3-Dichloropropene	5.0
3.	Vinyl Chloride	5.0	20.	Trichloroethene	5.0
4.	Chloroethane	5.0	21.	Dibromochloromethane	5.0
5.	Methylene Chloride	5.0	22.	1,1,2-Trichloroethane	5.0
6.	Acetone	10.0	23.	Benzene	5.0
7.	Carbon Disulfide	5.0	24.	Trans-1.3-Dichloropropene	5.0
8.	1,1-Dichloroethylene	5.0	25.	Bromoform	5.0
9.	1,1-Dichloroethane	5.0	26.	2-Hexanone	10.0
10.	1,2-Dichloroethylene (total)	5.0	27.	4-Methyl, 1,2-Pentanone	10.0
11.	Chloroform	5.0	28.	Tetrachloroethylene	5.0
12.	1,2-Dichloroethane	5.0	29.	Toluene	5.0
13.	2-Butanone	10.0	30.	Chlorobenzene	5.0
14.	1,1,1-Trichloroethane	5.0	31.	Ethylbenzene	5.0
15.	Carbon Tetrachloride	5.0	32.	Styrene	5.0
16.	Bromodichloromethane	5.0	33.	Total Xylenes	5.0
17.	1,1,2,2-Tetrachloroethane	5.0			

SECTION 3 - ASP ORGANICS (SEMI-VOLATILES) Method: NYSDEC-ASP-91-2					
	SEMI-VOLATILE	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**		**SEMI-VOLATILE**	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**
1.	Phenol	5.0	33.	Acenaphthene	5.0
2.	Bis(2-chloroethyl)ether	5.0	34.	2,4-Dinitrophenol	10.0
3.	2-Chlorophenol	5.0	35.	4-Nitrophenol	10.0
4.	1,3-Dichlorobenzene	5.0	36.	Dibenzofuran	5.0
5.	1,4-Dichlorobenzene	5.0	37.	Dinitrotoluene	5.0
6.	1,2-Dichlorobenzene	5.0	38.	Diethylphthalate	5.0
7.	2-Methylphenol	5.0	39.	4-Chlorophenyl phenyl ether	5.0
8.	2,2'oxybis(1-Chloropropane)	5.0	40.	Fluorene	5.0
9.	4-Methylphenol	5.0	41.	4-Nitroanile	10.0
10.	N-Nitroso-dipropylamine	5.0	42.	4,6-Dinitro-2-methylphenol	10.0
11.	Hexachloroethane	5.0	43.	N-nitrosodiphenyl amine	5.0
12.	Nitrobenzene	5.0	44.	4-Bromophenyl phenyl ether	5.0
13.	Isophorone	5.0	45.	Hexachlorobenzene	5.0
14.	2-Nitrophenol	5.0	46.	Pentachlorophenol	10.0
15.	2,4-Dimethylphenol	5.0	47.	Phenanthrene	5.0
16.	Bis(2-Chloroethoxy) methane	5.0	48.	Anthracene	5.0
17.	2,4-Dichlorophenol	5.0	49.	Carbazole	5.0
18.	1,2,4-Trichlorobenzene	5.0	50.	Di-n-butyl phthalate	5.0
19.	Naphthalene	5.0	51.	Fluoranthene	5.0
20.	4-Chloroaniline	5.0	52.	Pyrene	5.0
21.	Hexachlorobutadiene	5.0	53.	Butyl benzyl phthalate	5.0
22.	4-Chloro-3-methylphenol	5.0	54.	3,3'-Dichloro benzidine	5.0
23.	2-Methylnaphthalene	5.0	55.	Benz(a)anthracene	5.0
24.	Hexachlorocyclopentadiene	5.0	56.	Chrysene	5.0
25.	2,4,6-Trichlorophenol	5.0	57.	Bis(2-ethylhexyl) phthalate	5.0
26.	2,4,5-Trichlorophenol	10.0	58.	Di-n-octyl phthalate	5.0
27.	2-Chloronapthalene	5.0	59.	Benzo(b)fluoranthene	5.0
28.	2-Nitroananiline	10.0	60.	Benzo(k)fluoranthene	5.0
29.	Dimethyl phthalate	5.0	61.	Benzo(a)pyrene	5.0
30.	Acenaphthylene	5.0	62.	Indeno(1,2,3-cd) pyrene	5.0
31.	2,6-Dinitrotoluene	5.0	63.	Dibenz(a,h) anthracene	5.0
32.	3-Nitroaniline	10.0	64.	Benzo(g,h,i)perylene	5.0

SECTION 3 - ASP ORGANICS (PESTICIDES/PCBS) Method: NYSDEC-ASP-91-3					
	PESTICIDE/PCB	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**		**PESTICIDE/PCB**	**CONTRACT-REQUIRED QUANTITATION LIMIT (µg/l)**
1.	Alpha-BHC	0.05	15.	4,4'-DDT	0.10
2.	Beta-BHC	0.05	16.	Methoxychlor	0.5
3.	Delta-BHC	0.05	17.	Endrin ketone	0.10
4.	Gamma-BHC (lindane)	0.05	18.	Endrin aldehyde	0.10
5.	Heptachlor	0.05	19.	Alpha-Chlordane	0.05
6.	Aldrin	0.05	20.	Gamma-Chlordane	0.05
7.	Heptachlor epoxide	0.05	21.	Toxaphene	5.0
8.	Endosulfan I	0.05	22.	AROCHLOR-1016	1.0
9.	Dieldrin	0.10	23.	AROCHLOR-1221	1.0
10.	4,4'-DDE	0.10	24.	AROCHLOR-1232	1.0
11.	Endrin	0.10	25.	AROCHLOR-1242	1.0
12.	Endosulfan II	0.10	26.	AROCHLOR-1248	1.0
13.	4,4'-DDD	0.10	27.	AROCHLOR-1254	1.0
14.	Endosulfan sulfate	0.10	28.	AROCHLOR-1260	1.0

*Matrix: groundwater. For soil matrix, multiply CRDL by 100.

**Quantitation limit for medium-level soil is 1,200 µg/kg (wet weight basis).

APPENDIX F

Community Air Monitoring Plan

Community Air Monitoring Plan

Cottage-Garden Auto Repair Site
30 Garden Street and 16 Cottage Place
New Rochelle, New York
(BCP# C360180)

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the remedial investigation (RI) for the proposed development at 30 Garden Street and 16 Cottage Place, New Rochelle, New York.

The Site, which is the subject of this RIWP, is approximately 0.98-acres occupied by several commercial buildings. The Site properties are identified on the Westchester County Clerk's as a portion of tax parcel map Section-Block-Lot number 3-802-0032; 3-802-0036; and 3-802-0038.. The Site is depicted on a United States Geological Survey (USGS) Topographic Map (Figure 2.1) and Survey Map (Figure 2.2).

The seven lots were historically comprised of four commercial buildings, one residential building, and asphalt parking lots. The residential parcel was constructed in the early 1990s, with conversion to multiple apartments over the years. The remaining commercial buildings have been used as a Kitchen and Bath dealer, warehouses, retail tire and auto repair facility, a gasoline station with tanks that were closed in 2001, and various other commercial, retail, and light manufacturing uses. The auto repair facility, former Plastic Works manufacturing and/or Strip-A-Way of New Rochelle, Inc. company on the Site were likely responsible for the VOCs and metals contamination. The buildings were demolished by the Requestors upon acquisition or leasing in late 2017.

1.1 OBJECTIVES

The objective of this CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise as a result of the planned remedial excavation and construction, which may include temporary soil stockpiling.

1.2 METHODS

The CAMP will include monitoring for particulate matter (e.g., airborne “dust”) during the planned remedial excavation and construction activities. Readings will be recorded and will be available for State (DEC and DOH) personnel to review, as requested.

1.3 PARTICULATE MONITORING

When deemed by SESI to be applicable, particulate (e.g. “dust”) emissions will be measured continuously at the upwind and downwind work zone boundaries. Real time monitoring equipment (e.g. Trak TSI Dust monitors or equivalent), with audible alarms and capable of measuring particulate matter less than 10 micrometers in size (PM-10), will be used. If the wind is calm, the monitors should be placed between each work area and the nearest sensitive receptors. If the wind is variable, the monitors must be placed accordingly to ensure there is a monitor downwind of each work area at all times. Air monitoring locations will be selected daily based on prevailing wind conditions and specific locations where field-work is to be conducted on a daily basis.

- If the downwind particulate level is 100 micrograms per cubic meter (ug/m3) greater than background (upwind) for a 15-minute period or if airborne dust is observed leaving the work area, then the following dust suppression techniques will be employed.

  a) Applying water on haul roads (water supplied from hydrant);

  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.

  Work will continue with dust suppression provided that downwind particulate levels do not exceed 150 ug/m3 above upwind levels and provided that no visible dust is migrating from the work area.

- If, after dust suppression techniques, downwind particulate levels are greater than 150 ug/m3 above upwind levels, work will be stopped and a re-evaluation of activities

will be initiated. Work will resume, provided that dust suppression measures and other controls are successful in reducing downwind particulate concentrations to within 150 ug/m3 of the upwind level and in preventing visible dust migration.

- All readings must be recorded and be available for State (NYSDEC and NYSDOH) and County Health personnel to review.

1.4 VOC MONITORING

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.

APPENDIX G

NYSDEC Soil Cleanup Objectives

375-6.8 Soil cleanup objective tables.

(a) Unrestricted use soil cleanup objectives.

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
Metals		
Arsenic	7440-38-2	13 [c]
Barium	7440-39-3	350 [c]
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5 [c]
Chromium, hexavalent [e]	18540-29-9	1[b]
Chromium, trivalent [e]	16065-83-1	30 [c]
Copper	7440-50-8	50
Total Cyanide [e, f]		27
Lead	7439-92-1	63 [c]
Manganese	7439-96-5	1600 [c]
Total Mercury		0.18 [c]
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9[c]
Silver	7440-22-4	2
Zinc	7440-66-6	109 [c]
PCBs/Pesticides		
2,4,5-TP Acid (Silvex) [f]	93-72-1	3.8
4,4'-DDE	72-55-9	0.0033 [b]
4,4'-DDT	50-29-3	0.0033 [b]
4,4'-DDD	72-54-8	0.0033 [b]
Aldrin	309-00-2	0.005 [c]
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.036
Chlordane (alpha)	5103-71-9	0.094

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
delta-BHC [g]	319-86-8	0.04
Dibenzofuran [f]	132-64-9	7
Dieldrin	60-57-1	0.005 [c]
Endosulfan I [d, f]	959-98-8	2.4
Endosulfan II [d, f]	33213-65-9	2.4
Endosulfan sulfate [d, f]	1031-07-8	2.4
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.042
Lindane	58-89-9	0.1
Polychlorinated biphenyls	1336-36-3	0.1
Semivolatile organic compounds		
Acenaphthene	83-32-9	20
Acenapthylene [f]	208-96-8	100 [a]
Anthracene [f]	120-12-7	100 [a]
Benz(a)anthracene [f]	56-55-3	1 [c]
Benzo(a)pyrene	50-32-8	1 [c]
Benzo(b)fluoranthene [f]	205-99-2	1 [c]
Benzo(g,h,i)perylene [f]	191-24-2	100
Benzo(k)fluoranthene [f]	207-08-9	0.8 [c]
Chrysene [f]	218-01-9	1 [c]
Dibenz(a,h)anthracene [f]	53-70-3	0.33 [b]
Fluoranthene [f]	206-44-0	100 [a]
Fluorene	86-73-7	30
Indeno(1,2,3-cd)pyrene [f]	193-39-5	0.5 [c]
m-Cresol [f]	108-39-4	0.33 [b]
Naphthalene [f]	91-20-3	12
o-Cresol [f]	95-48-7	0.33 [b]

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
p-Cresol [f]	106-44-5	0.33 [b]
Pentachlorophenol	87-86-5	0.8 [b]
Phenanthrene [f]	85-01-8	100
Phenol	108-95-2	0.33 [b]
Pyrene [f]	129-00-0	100
Volatile organic compounds		
1,1,1-Trichloroethane [f]	71-55-6	0.68
1,1-Dichloroethane [f]	75-34-3	0.27
1,1-Dichloroethene [f]	75-35-4	0.33
1,2-Dichlorobenzene [f]	95-50-1	1.1
1,2-Dichloroethane	107-06-2	0.02 [c]
cis -1,2-Dichloroethene [f]	156-59-2	0.25
trans-1,2-Dichloroethene [f]	156-60-5	0.19
1,3-Dichlorobenzene [f]	541-73-1	2.4
1,4-Dichlorobenzene	106-46-7	1.8
1,4-Dioxane	123-91-1	0.1 [b]
Acetone	67-64-1	0.05
Benzene	71-43-2	0.06
n-Butylbenzene [f]	104-51-8	12
Carbon tetrachloride [f]	56-23-5	0.76
Chlorobenzene	108-90-7	1.1
Chloroform	67-66-3	0.37
Ethylbenzene [f]	100-41-4	1
Hexachlorobenzene [f]	118-74-1	0.33[b]
Methyl ethyl ketone	78-93-3	0.12
Methyl tert-butyl ether [f]	1634-04-4	0.93
Methylene chloride	75-09-2	0.05

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
n - Propylbenzene [f]	103-65-1	3.9
sec-Butylbenzene [f]	135-98-8	11
tert-Butylbenzene [f]	98-06-6	5.9
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene [f]	95-63-6	3.6
1,3,5-Trimethylbenzene[f]	108-67-8	8.4
Vinyl chloride[f]	75-01-4	0.02
Xylene (mixed)	1330-20-7	0.26

All soil cleanup objectives (SCOs) are in parts per million (ppm).

Footnotes

[a] The SCOs for unrestricted use were capped at a maximum value of 100 ppm. See Technical Support Document (TSD), section 9.3.

[b] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the Track 1 SCO value.

[c] For constituents where the calculated SCO was lower than the rural soil background concentration, as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 1 SCO value for this use of the site.

[d] SCO is the sum of endosulfan I, endosulfan II and endosulfan sulfate.

[e] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[f] Protection of ecological resources SCOs were not developed for contaminants identified in Table 375-6.8(b) with “NS”. Where such contaminants appear in Table 375-6.8(a), the applicant may be required by the Department to calculate a protection of ecological resources SCO according to the TSD.

(b) Restricted use soil cleanup objectives.

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39-3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96-5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'- DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07-8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h)anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
Methyl tert-butyl ether	1634-04-4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).
NS=Not specified. See Technical Support Document (TSD).

Footnotes

[a] The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b] The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c] The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d] The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e] For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f] For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g] This SCO is derived from data on mixed isomers of BHC.

[h] The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i] This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j] This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

APPENDIX H

Citizens Participation Plan

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Cottage-Garden Auto Repair Site

August 2019

C360180
30 Garden Street and 16 Cottage Place
New Rochelle
Westchester County, New York

Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **The Mark 95 LLC and The Mark II LLC ("Applicants")**
Site Name: **Cottage-Garden Auto Repair Site ("Site")**
Site Address: **30 Garden Street and 16 Cottage Place, New Rochelle, NY**
Site County: **Westchester**
Site Number: **C360180**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The

flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

{Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	

{Citizen Participation Activities	Timing of CP Activity(ies)
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

There will be areas on the Site where soil excavation is necessary and when underground storage tanks will be removed as part of what is caused an interim remedial measure (IRM). Therefore, once the IRM work, and then later the Site-wide remediation commences, there may be concerns regarding odors, noise or truck traffic coming from the Site. However, these impacts will be mitigated through implementation of a Health and Safety Plan and Soil Management Plan approved by the Department, which will be designed to minimize these impacts. A Community Air Monitoring Plan will also be implemented to monitor dust and vapors to ensure the community is not impacted.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

- **location – 30 Garden Street and 16 Cottage Place**
- **setting - urban**
- **site size – 0.98 acres**
- **adjacent properties – commercial, residential**

History of Site Use, Investigation, and Cleanup

- The site was historically occupied by four commercial buildings and one residential building. The combined parcels comprise approximately 0.98 acres of land according to combining the acreage listed on the Tax Roll Assessment for each of the lots. All on-Site buildings were demolished by the Requestors upon acquisition or leasing of the parcels in late 2017. The site historically housed four commercial buildings, one residential building, and asphalt parking lots. The residential parcel was constructed in the early 1990s, with conversion to multiple apartments over the years. The remaining commercial buildings were used as a Kitchen and Bath dealer, warehouses, retail tire and auto repair facility, a gasoline station with tanks that were closed in place in 2000-2001, and various other commercial, retail, and light manufacturing uses. An auto repair facility present for 60 years, former Plastic Works manufacturing and/or Strip-A-Way of New Rochelle, Inc. company present on the site for 20 years were likely

responsible for the volatile organic compound (VOC) vapor and metals soil contamination found to date. The Site is a currently vacant lot. Interstate I-95 lies along the northwesterly border of the site. The Metro North Railroad station is located to the east of the site. There are commercial and residential properties bordering the site to the north and south.

5. Investigation and Cleanup Process

Application

The Applicants have applied for and been accepted into New York's Brownfield Cleanup Program as Volunteers, which means that the Applicants were not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteers must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site**.**

The Applicants in its Application proposes that the site will be used for residential use. Whether the site can be remediated to Restricted Residential or Unrestricted soil cleanup objectives will be determined after the Remedial Investigation is complete.

To achieve this goal, the Applicant will conduct investigation activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) identify the source(s) of the contamination;
3) assess the impact of the contamination on public health and the environment; and
4) provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft “Remedial Investigation Work Plan” to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a “significant threat,” it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period. At this site and IRM will be performed to remove some underground storage tanks that were closed in place so that an investigation can be performed under the tanks once removed to determine if the tanks leaked.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a “Certificate of Completion” (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”.

The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional

control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Michael Kilmer
Project Manager
NYSDEC
21 South Putt Corners Road
New Paltz, NY 12561
Michael.kilmer@dec.ny.gov

Daniel Bendall
NYSDEC
21 South Putt Corners
New Paltz, NY 12561
Daniel.bendall@dec.ny.gov

New York State Department of Health (NYSDOH):

Maureen Schuck
Project Manager
NYSDOH
Bureau of Environmental Exposure Investigation
Empire State Plaza
Corning Tower Room 1787 Albany, NY 12237
maureen.schuck@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

New Rochelle Public Library
Tom Geoffino, Director
1 Library Plaza
New Rochelle, NY 10801
Phone: (914) 632-7878

Hours:

Mon, Tues, Thurs.	9am-8pm
Wednesday	10am-6pm
Friday, Saturday	9am-5pm
Sunday	1pm-5pm

Appendix B - Site Contact List

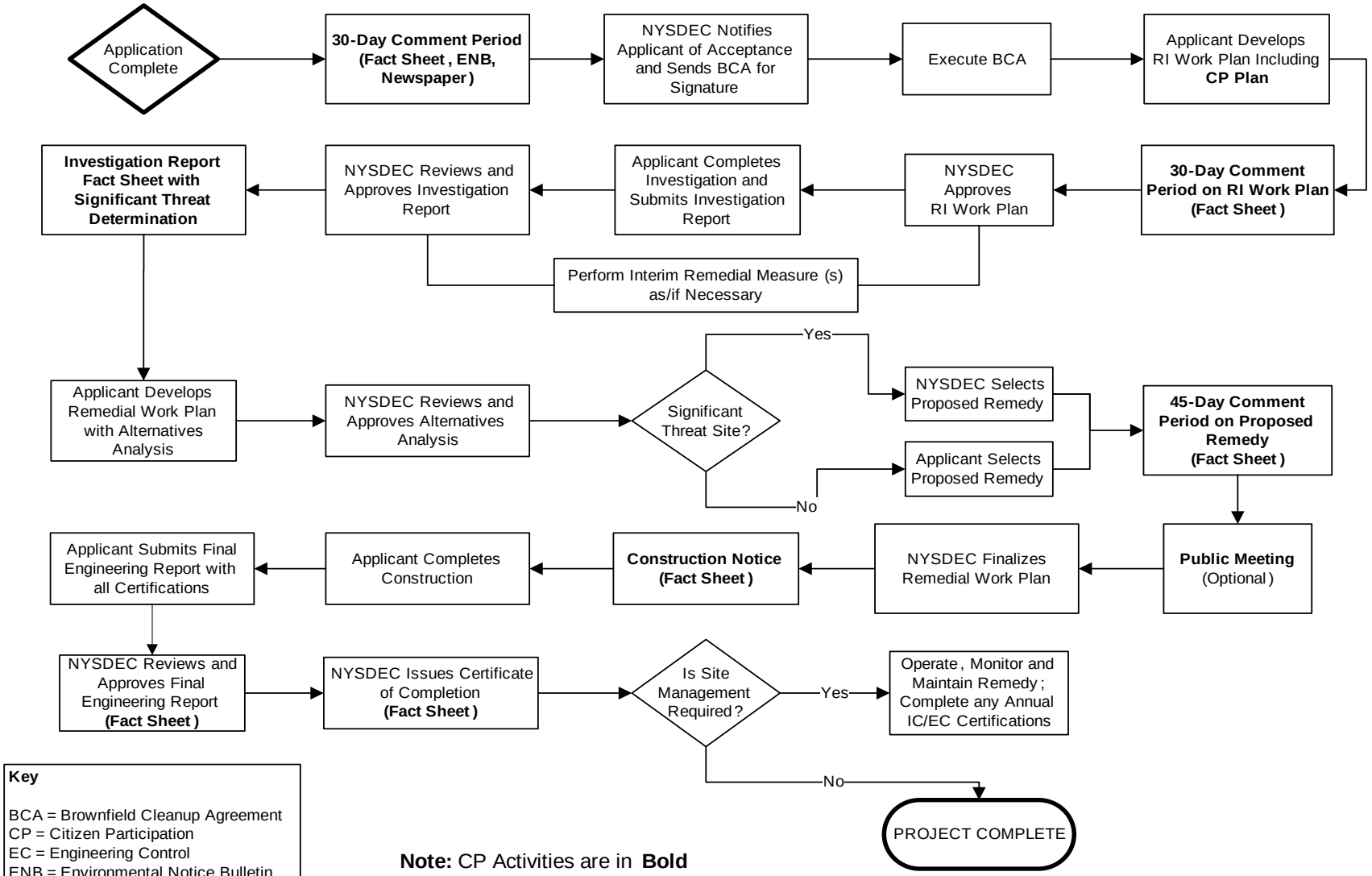
Federal & State Government Officials	
Chuck E. Schumer U.S. Senate 780 Third Avenue, Suite 2301 New York, NY 10017	Kirsten Gillibrand U.S. Senate 780 Third Avenue, Suite 2601 New York, NY 10017
Andrea Stewart-Cousins 35th Senate District New York State Senator 28 Wells Avenue, Building #3 Yonkers, NY 10701	Nita Lowery 17th District U.S. House of Representatives 222 Mamaroneck Avenue #312 White Plains, NY 10605
New York State Assemblyperson Amy Paulin 700 White Plains Road, Suite 252 Scarsdale, NY 10583	
Local Government Officials	
George Latimer Westchester County Executive 148 Martine Ave. Room 900 White Plains, NY 10601	Edward Buroughs Westchester County Commissioner of Planning 148 Martine Avenue White Plains, NY 10601
Sarah C. Dodds-Brown New Rochelle Planning Board Chairperson 515 North Avenue New Rochelle, NY 10801	Noam Bramson Mayor of The City of New Rochelle 515 North Avenue New Rochelle, NY 10801
Eileen O'Rourke New Rochelle City Zoning Board of Appeals Chairperson 90 Beaufort Place/City Hall Annex, Rm B1 New Rochelle, NY 10801	
Public Water Supplier	
Westchester Joint Water Works Westchester Public Water Supplier 1625 Mamaroneck Ave Mamaroneck, NY 10543	

Adjacent Property Owners	
Simba Properties LLC Adjacent Property Owner of 21 Cottage Place 21 Cottage Place New Rochelle, NY 10801	Eagle Auto Sales Adjacent Property Operator of 21 Cottage Place 21 Cottage Place New Rochelle, NY 10801
3 Cottage Place LLC Adjacent Property Operator of 3 Cottage Place 3 Cottage Place New Rochelle, NY 10801	Lexington Center for Recovery Adjacent Property Operator of 3 Cottage Place 3 Cottage Place New Rochelle, NY 10801
Parole Division Adjacent Property Operator of 3 Cottage Place 3 Cottage Place New Rochelle, NY 10801	Thoulton Surgeon Adjacent Property Owner of 1 Cottage Place 1 Cottage Place New Rochelle, NY 10801
ANC Veterinary Center Adjacent Property Operator of 1 Cottage Place 1 Cottage Place New Rochelle, NY 10801	Consolidated Rail Corp. Adjacent Property Owner of North Avenue 54 Meadow Street New Haven, CT 06501
City of New Rochelle Adjacent Property Owner of Garden Street 515 North Avenue New Rochelle, NY 10801	Pebbles Properties 20G Inc Adjacent Property Owner of 20 Garden Street 20 Garden Street New Rochelle, NY 10801
Stina Provisions, Inc. Adjacent Property Operator of 20 Garden Street 20 Garden Street New Rochelle, NY 10801	Tiran Rentals Adjacent Property Operator of 20 Garden Street 20 Garden Street New Rochelle, NY 10801
New York State Adjacent Property Owner of North Avenue and Garden Street 4 Burnett Blvd. Poughkeepsie, NY 12603	David Zucker Adjacent Property Owner of 20 Cottage Place 20 Cottage Place New Rochelle, NY 10801
Dave's Cast of Characters Inc Adjacent Property Operator of 20 Cottage Place 20 Cottage Place	

New Rochelle, NY 10801	

Appendix C - Site Location Map

Appendix D– Brownfield Cleanup Program Process



Key

BCA = Brownfield Cleanup Agreement
CP = Citizen Participation
EC = Engineering Control
ENB = Environmental Notice Bulletin
IC = Institutional Control
RI = Remedial Investigation

Note: CP Activities are in **Bold**

Remedial Programs
Scoping Sheet for Major Issues of Public Concern

Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern (see instructions)

Site Name: Cottage Garden Auto Repair Site

Site Number: C360180

Site Address and County: 10 & 16 Cottage Place and 25, 26 & 30 Garden Street, New Rochelle, NY
Westchester County

Remedial Party(ies): The Mark 95 LLC, The Mark 95 II LLC

Note: For Parts 1. – 3. the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**
None to date other than standard odor noise and truck traffic impacts during remediation

How were these issues and/or information needs identified?
Standard remediation impacts

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
None at this time

How were these information needs identified?
Not applicable

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
CPP and Fact Sheet process should keep community updated

How were these issues and/or information needs identified?
Standard BCP CPP process.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning at and around site:
☒ **Residential** ☐ **Agricultural** ☐ **Recreational** ☒ **Commercial** ☐ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☒ **High** ☐ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

f. Other environmental issues significantly impacted/impacting the affected community?
☒ **Yes** ☐ **No**

Provide details if appropriate:
There are other brownfield sites in the area.

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☐ **Yes** ☒ **No**

h. Special considerations:
☐ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**
Click here to enter text.

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. Are *other* individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☐ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☐ **Local Officials:** Click here to enter text.

☐ **Media:** Click here to enter text.

☐ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☐ **Citizens/Community Group(s):** Click here to enter text.

☐ **Environmental Justice Group(s):** Click here to enter text.

☐ **Environmental Group(s):** Click here to enter text.

☐ **Civic Group(s):** Click here to enter text.

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Prepared/Updated By: Linda Shaw, Esq. **Date:** 1/21/2019

ReviewedApproved By: Click here to enter text. **Date:** Click here to enter text.