

REMEDIAL ACTION WORKPLAN

For:

Proposed SNL Storage Facility 1454 39th Street (Formerly 1440-1460 39th Street) Brooklyn, New York 11218

NYSDEC BCP Site #C224311

Prepared for:

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CERTIFICATIONS

I, Justin M. Protasiewicz, 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)

Justin M. Protasiewicz

7/5/2022

NYS Professional Engineer (# 102352) Date

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LIST OF ACRONYMS

Acronym	Definition
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
ВСР	Brownfield Cleanup Program
bgs	Below ground surface
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
су	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 1440-1460 39th Street Site (herein referred to as the "Site") was accepted into the New York Brownfield Cleanup Program (BCP) by the New York Department of Environmental Conservation (NYSDEC) pursuant to execution of a Brownfield Cleanup Agreement ("BCA") on August 24, 2020 (BCP Site No. C224311). The Site was formerly improved by two (2) single-story structures and associated building slabs and foundations. The Site is located in a commercial, industrial, and residential area and is identified as Block 5346, Lot 17, totaling 0.57 acres. The Site is bounded by 39th Street to the north, beyond which lies a school (Bais Tziporah), auto repair and maintenance services, and commercial/industrial warehouses; to the east by commercial retail and warehouses; to the south by residential properties; and to the west by commercial retail and warehouses. The Site has been developed since the 1920s and was historically occupied by automotive repair, poultry storage, and unspecified manufacturing operations.

Summary of Remedial Investigation

The Remedial Investigation Report (RIR) for the Site 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 October 20, 2020, and which was approved by the NYSDEC October 28, 2020 and the NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10).

The RI was conducted in November of 2020 and included the installation of fourteen (14) soil borings advanced up to fifty-five (55) feet below ground surface (ft. bgs), two (2) additional soil borings were advanced to fifteen (15) feet for visual assessment, eight (8) groundwater monitoring wells screened at varying depths, and six (6) soil vapor sampling points advanced to twenty-five (25) ft. bgs. A total of ninety-six (96) soil samples, eight (8) initial groundwater samples, five (5) supplemental groundwater samples, and six (6) soil vapor samples were collected during the investigation. Areas of Concern (AOC) locations were used to select soil sample locations. The AOCs include former underground storage tanks (USTs), floor drains, a former hydraulic lift, historic automotive repair, and historic/urban fill.

Pesticides and volatile organic compounds (VOCs) were identified at concentrations in soil exceeding the Unrestricted Use Soil Cleanup Objectives (USCO). SVOCs, and metals were identified at concentrations in soil exceeding the USCO, Residential SCO (RSCO), Restricted Residential SCO (RRSCO) and Commercial SCO (CSCO). Previous investigations conducted in

an April 2019 sampling event identified lead at concentrations that exceeded the USEPA TCLP limit which indicated the materials in one area of the Site are hazardous. Polycyclic aromatic hydrocarbons, (PAHs), and metals are present throughout the Site within the historic fill at concentrations exceeding the USCOs, RSCOs, RRSCO, and/or CSCOs.

The historic/urban fill layer at the Site is impacted above the USCOs, RSCOs, RRSCO, and CSCOs. Vertical soil contaminant delineation was achieved during the RI. With the exception of nickel and chromium, vertical delineation was confirmed with a sample that meets the USCO levels at each boring location. The presence of nickel and chromium throughout sampling strata is indicative that metals are naturally occurring at the Site. The samples collected within native soils exhibited concentrations below USCOs for all of the other analytes. Vertical delineation is considered complete at or just below the fill layer.

The Site groundwater, which was gauged at an approximate depth of 45 ft. bgs during the November 2020 RI, has been impacted with VOCs, SVOCs, and metals at concentrations exceeding the NYSDEC Technical Operational Guidance Series (TOGS) 1.1.1 GA Ambient Water Quality Standards (AWQS). Polycyclic aromatic hydrocarbons (PAHs) and metals were detected in all eight (8) wells and was confirmed in a duplicate sample. Dissolved concentrations were relatively low, and no free product was encountered or observed in any well, or at any test location. Vertical delineation of PAHs was achieved at shallow depths between five to ten feet below grade surface and no evidence of migration from shallow soil to groundwater was observed. PAHs in groundwater are likely attributed to a potential off-Site source; however, the potential for a former discharge from the Site UST's will be confirmed during the Interim Remedial Measure and/or Remedial Action.

At the request of the NYSDEC, additional groundwater samples were collected and analyzed for dissolved (filtered) TAL Metal analysis in March 2021. Sampling was performed to evaluate dissolved (filtered) metal concentrations; specifically, to determine if naturally occurring nickel concentrations in soil have impacted groundwater quality. Dissolved concentrations of nickel were detected below the AWQS.

Several VOCs were detected in Site soil vapor. To evaluate potential indoor vapor concerns, the soil gas VOCs were compared to the applicable New York State Department of Health (NYSDOH) indoor air/soil vapor matrices values (May 2017). VOCs including tetrachloroethene (PCE), trichloroethene (TCE), methylene chloride, and 1,1,1-trichloroethylene

were detected at concentrations below of the applicable sub slab matrices' values; therefore, no further consideration is required.

Summary of Selected Remedial Actions

A summary of the Track 2 – Residential remedial actions to address the impacts identified are discussed below:

- 1. Installation of a support of excavation (SOE) will be completed along the side walls of the entire property boundary for temporary structural stability of the excavations and to prevent impact to off-site structures. A soldier beam and lagging wall system with associated features will be installed to support the excavation of the on-site contaminated soil and contaminated historic fill. The support of excavation system will be installed under the Revised IRMWP prepared by SESI and submitted to NYSDEC on March 25, 2021, and which was approved by the NYSDEC on April 7, 2021. The SOE installation will be conducted as described in the March 2021 Revised Interim Remedial Measure Workplan.
- 2. Excavation of contaminated fill soil will be completed to an approximate depth of 15 ft-bgs. Further excavation of native soil containing natural concentrations of nickel, will excavated to an approximate depth of 25 ft-bgs as required for the proposed redevelopment. A Track 2 Residential cleanup will be achieved by removal of the contaminated fill/soil. The department has indicated that nickel contamination is considered hazardous waste, which will be encountered at depths between 15 to 25 feet during supplemental excavation for Site redevelopment. The excavation and disposal of the contaminated fill/soil, as well as, the underlying native soil, will be completed under the Revised IRMWP prepared by SESI and submitted to NYSDEC on March 25, 2021. The Revised IRMWP was which was approved by the NYSDEC on April 7, 2021.
- 3. Endpoint confirmatory sampling will be performed to assess post excavation conditions. Track 2 Residential conditions are anticipated following excavation. If possible, sidewall sampling will be implemented to document any remaining contamination at the property boundary.

- 4. Removal of the abandoned in place USTs is being completed during IRM activities. The UST removals are being conducted as described in the March 2021 Revised Interim Remedial Measure Workplan prepared by SESI, which was approved by the NYSDEC on April 7, 2021.
- 5. Natural occurring concentrations of nickel were detected in soil, and the presence of regional polycyclic aromatic hydrocarbons (PAHs) were identified in groundwater at the Site during the Remedial Investigation (RI). Remediation of the naturally-occurring nickel was determined to be technically impractical, and groundwater impacts were determined to be derived from an unknown off-Site source. Following the correspondence with the department regarding this matter, it was determined that the Nickel at the Site in the native soils is considered hazardous and that a Track 1 remedy will not be feasible; however, an Environmental Easement (EE), nor a Site Management Plan would be required under a Track 2 Residential Cleanup remedy for the Site.
- 6. As previously discussed, remediation of Nickel impacted soil is not technically practical as the Nickel is considered to be naturally occurring; however, the NYSDEC considers the Nickel to be hazardous. The NYSDEC determined that a EE or SMP would not be required based on the presence of Nickel. As per correspondence with the department a Track 2 Residential cleanup will not require long term management of residual contamination, an EE or SMP as they pertain to future phases of construction, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) soil excavation and (4) reporting;
- 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;
- 8. Import of backfill materials during redevelopment construction activities, to be used for backfill and soil cover, if necessary, must be in compliance with: (1) chemical limits and other specifications included in NYCRR Sections 375-6.7(d) and 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;

9. 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.

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 Final Engineering Report (FER). **Figure 5.1** and **5.1A** present remediation area for a Track 2 – Residential Cleanup.

1.0 INTRODUCTION

The NYSDEC has entered into a BCA for the property located at 1454 39th Street (formerly 1440-1460 39th Street), in Brooklyn, Kings County, New York with the Volunteer, SNL XXII, LLC, known as the 1440-1460 39th Street Site (BCP# C224311; the "Site") on August 24, 2020. The Site is identified on the city tax map as Block 5346, Lot 17 and is located at 1454 39th Street in Brooklyn, New York. A Site Location map is illustrated on **Figure 1.1**. A Site Plan, which includes the boundaries of the Site is presented as **Figure 1.2**.

SESI (SESI) Consulting Engineers has prepared this Remedial Action Work Plan (RAWP) for the remediation of the Site on behalf of the Volunteer. This RAWP includes an analysis of the remedial alternatives available to remediate the contamination as reported in the Remedial Investigation Report (RIR), dated December 2020, 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 2 - Residential Cleanup, which will not require an Environmental Easement or Site Management Plan.

1.1 SITE LOCATION AND DESCRIPTION

The Site is identified on the city tax map as Block 5346, Lot 17, 26, 28, and 149 and is located at 1454 39th Street in Brooklyn, Kings County, New York. The Site is located in an area of mixed commercial, industrial, and residential uses. The Site, which is generally flat and consists of 0.57-acres, is currently vacant and covered with hard surfaces including previous building foundations, building slabs, and paving. The Site has been historically utilized for automotive repair, poultry storage, and unspecified manufacturing operations. **Figure 2.1** presents a Site Plan depicting the historic operations.

According to the United States Geological Survey (USGS) Coney Island, 2013/2014, 7.5-minute topographic map, the Site's average topographic elevation is approximately 52-feet above

mean sea level (msl). The topographic map indicates that the topography at the Site is relatively flat with regional topography sloping gently to the east.

There are no surface water bodies or streams on or directly adjacent to the Site. SESI did not observe any wetlands areas on the Site. Storm water drainage patterns are generally consistent with the surrounding topography and primarily flow to the east. The nearest water body is the Prospect Park Lake located approximately 1.1 miles northeast of the Site. **Figure 1.2** presents a Site Plan and the Brownfield Boundary.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed development consists of 4-story self-storage facility with a cellar and subcellar. The estimated building footprint will encompass approximately 25,000 square feet.

1.3 DESCRIPTION OF SURROUNDING PROPERTIES

The surrounding properties consist of commercial, industrial, and residential properties. Sensitive receptors such as daycare facilities, elder care facilities or hospitals were not identified in the properties immediately adjacent to the Site. The nearest sensitive receptor are the Bais Tziporah located adjacent to the Site on the northern Side of 39th Street and Public School 164 (Caesar Rodney School) located approximately 700 feet southwest of the Site.

Direction	Adjacent Property					
North	39 th Street, Commercial Properties Beyond					
South	uth 1 and 2-Story Commercial Properties					
East	2-Story Residential Properties, 40 th Street beyond					
West	1 and 2-Story Commercial Properties					

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 Workplan (RIWP), which was approved by the NYSDEC on October 28, 2020. The investigation was conducted during November 2020.

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, RSCOs, RRSCOs and CSCOs. The constituent concentrations in groundwater were compared to the applicable AWQS.

2.1 SOIL REMEDIAL INVESTIGATION FINDINGS

A total of ninety-six (96) soil samples were collected from fourteen (14) soil borings identified as S-32 to S-45. Two (2) additional borings were completed to visually assess subsurface conditions in the area of suspected USTs; no evidence of petroleum impacted soil was observed and no sampling was performed at these borings. The borings were advanced utilizing a Geoprobe drilling rig. Borings were advanced to a maximum depth of 55 ft bgs. The soil boring locations and results 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+30/TAL, 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 E* of the RIR.

SVOCs

PAHs including benzo[a]anthracene, benzo(a)pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene and 3-methylphenol/4-methylphenol were identified in six (6) soil samples from five (5) soil borings at concentrations that exceeded the USCO, and/or RSCO, and/or RRSCO, and/or CSCO. Historic fill was present at these locations to depths ranging up to twelve (12) ft bgs. The highest concentrations of PAHs were noted in surface soil samples; specifically, S-39 which was located in the southwestern portion of the Site in the vicinity of a sub-surface hydraulic lift. PAHs in exceedance of the SCOs do not extend into native soils, and are concentrated within shallow fill

layers up to a maximum depth of 5 ft bgs. The soil samples with PAHs exceeding the USCO RSCO, and CSCO are presented on **Figure 2.2** and **Table 2.1** below.

Table 2.1 Summary of PAHs Exceeding the NYSDEC USCO, RSCO, RRSCO, and CSCO

				LOC	ATION	S-34 SURFACE	S-34 (4-5)	S-35 (11-12)	S-39 SURFACE	S-42 SURFACE	S-44 SURFACE
		SAN	APLING	DATE	11/6/2020	11/6/2020	11/6/2020	11/4/2020	11/5/2020	11/9/2020	
SAMPLE DEPTH INTERVAL (FEET)						0-1	4-5	11-12	0-1	0-1	0-1
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Benzo(a)anthracene	1	1	1	5.6	mg/kg	5.4	2.3	0.9	21	1.3	2.1
Benzo(a)pyrene	1	1	1	1	mg/kg	4.4	1.8	0.82	17	1.1	2.8
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	6.1	2.3	0.95	24	1.5	3.4
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	1.7	0.89	0.42	7.4	0.4	1.2
Chrysene	1	1	3.9	56	mg/kg	4.6	1.8	0.84	17	1.2	1.8
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	1	0.28	0.12	2.8	0.14	0.4
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	3	1.2	0.5	12	0.7	1.8
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	0.12J	0.03J	ND	0.35J	ND	ND

Notes:

S-34(4-5) = Sample Location and Sample Depth

J = Estimated Concentration
ND – Compound Not Detected
Mg/kg – milligrams per kilogram

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Highlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

Metals

Metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and zinc were identified in sixty-seven (67) soil samples in each of the fourteen (14) soil borings at concentrations exceeding their USCO, RSCO, RRSCO, and/or CSCO. The depth of metals impacts ranged from surface to 14 ft. bgs; however, chromium and nickel were identified at deeper intervals within native soils and appear to be naturally occurring. Metal exceedances were concentrated in surface and shallow soil samples across the Site exceeding their respective USCOs RSCOs and CSCOs.

Arsenic, nickel, lead, and mercury were detected at concentrations which exceed the CSCO. Mercury was detected in two (2) samples collected from S-34 at concentrations ranging from 3.5 to 19.9 mg/kg, above the CSCO of 2.8 mg/kg. Arsenic was detected in one (1) surface sample collected from S-39 at a concentration of 20.5 mg/kg, above the CSCO of 16 mg/kg. Lead was detected in one (1) surface sample collected from S-40 at a concentration of 1,050 mg/kg, above the CSCO of 1,000 mg/kg. Vertical delineation was achieved at these locations, and no horizontal distribution was identified. The soil samples with metals exceeding the SCOs are presented on **Figure 2,2** and **Table 2.2** as follows.

Table 2.2 Summary of Metals Exceeding the NYSDEC USCO, RSCO, RRSCO and CSCO

				LO	CATION	S-32 SURFACE	S-32 (3-4)	S-32 (13-14)	S-32 (17-18)	S-32 (22-23)	S-32 (45-46)
				SAMPLIN	NG DATE	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/10/2020	11/17/2020
		SAMPI	E DEPTH	INTERVA	L (FEET)	0-1	3-4	13-14	17-18	22-23	45-46
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	4.21	0.608J	0.518J	0.458J	0.415J	0.241J
Copper, Total	50	270	270	270	mg/kg	112	64.8	39.7	20.4	15.5	8.05
Lead, Total	63	400	400	1000	mg/kg	187	45.3	15.9	4.16	7.55	3.97J
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	0.828	0.155	ND	ND	ND	ND
Nickel, Total	30	140	310	310	mg/kg	42	9.45	34.2	94.6	48.6	49.6
Zinc, Total	109	2200	10000	10000	mg/kg	152	33.1	42.2	29.8	33.5	18.5
				LC	CATION	S-33 SURFACE		S-33 (16-17)	S-33 (44-45)	S-34 SURFACE	S-34 (4-5)
				SAMPLIN		11/4/2020	11/4/2020	11/4/2020	11/17/2020	11/6/2020	11/6/2020
		SAMPI	E DEPTH			0-1	13-14	16-17	44-45	0-1	4-5
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Lead. Total	63	400	400	1000	mg/kg	32.5	6.49	17.6	3.03J	51.8	73.2
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	0.311	ND	ND	ND	3.15	19.9
Nickel. Total	30	140	310	310	mg/kg	28	106	107	30.1	6.99	16.8
				LC	CATION	S-34 (13-14)	S-34 (18-19)	S-34 (23-24)	S-34 (49-50)	S-35 (SURFACE)	S-35 (18-19)
				SAMPLIN		11/6/2020	11/6/2020	11/6/2020	11/17/2020	11/6/2020	11/6/2020
		SAMPI	E DEPTH			13-14	18-19	23-24	49-50	0-1	18-19
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Lead, Total	63	400	400	1000	mg/kg	46.7	6.06	4.22	8.63	66.4	3.06J
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	ND	ND	ND	0.278	ND
Nickel, Total	30	140	310	310	mg/kg	76.7	48.7	31.4	40.4	14.4	31.7
				LC	CATION	S-35 (21-22)	S-35 (51-52)	S-36 (8-9)	S-36 (13-14)	S-36 (22-23)	S-36 (53-54)
				SAMPLIN		11/6/2020	11/16/2020	11/6/2020	11/6/2020	11/6/2020	11/16/2020
		SAMPI	E DEPTH			21-22	51-52	8-9	13-14	22-23	53-54
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Chromium, Total	30	36	180	400	mg/kg	21.9	12.8	14.2	45.3	16.3	28
Nickel. Total	30	140	310	310	mg/kg	38.7	98.8	33.4	66.4	54.2	75.1
				LC	CATION			S-37 (16-17)	S-37 (50-51)	S-38 SURFACE	S-38 (4-5)
				SAMPLIN		11/10/2020	11/10/2020	11/10/2020	11/16/2020	11/10/2020	11/10/2020
		SAMPI	E DEPTH			0-1	12-13	16-17	50-51	0-1	4-5
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Chromium, Total	30	36	180	400	mg/kg	12.4	25.4	21.2	40.2	13.2	18.4
Lead, Total	63	400	400	1000	mg/kg	68.1	5.8	5.86	7.77	98.1	83.7
Nickel, Total	30	140	310	310	mg/kg	13.4	37.1	30.5	56.4	18.9	33.6
				0.0	CATION	S-38 (6-7)	S-38 (13-14)	S-38 (16-17)	S-38 (23-24)	S-38 (51-52)	S-39 SURFACE
				SAMPLIN		11/10/2020	11/10/2020	11/12/2020	11/12/2020	11/12/2020	11/4/2020
		SAMPI	E DEPTH			6-7	13-14	16-17	23-24	51-52	0-1
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Arsenic, Total	13	16	16	16	mg/kg	3.58	2.9	1.91	1.96	1.06	20.5
Barium, Total	350	350	400	400	mg/kg	33.6	69.7	37.9	19.6	16.5	397
Copper, Total	50	270	270	270	mg/kg	24.2	29.3	18.8	9.15	6.97	92.7
Lead, Total	63	400	400	1000	mg/kg	6.82	7.25	12.7	3.26J	3.27J	567
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	ND	ND	ND	ND	0.65
Nickel, Total	30	140	310	310	mg/kg	41.9	59.4	31.6	30.4	77.7	26.5
Zinc, Total	109	2200	10000	10000	mg/kg	43.9	41.7	35.2	19.3	17.4	259
, row	100		10000	.0000	71197119	70.0	71.7	00.2	10.0	17.7	200

						G 40 (= 6)	Ia -a				[a to arms:
					CATION	S-39 (7-8)	S-39 (12-13)	S-39 (18-19)	S-39 (21-22)	S-39 (42-43)	S-40 SURFACE
				SAMPLIN		11/4/2020	11/4/2020	11/5/2020	11/11/2020	11/18/2020	11/11/2020
	****		LE DEPTH			7-8	12-13	18-19	21-22	42-43	0-1
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Arsenic, Total	13	16	16	16	mg/kg	9.58	5.18	3.59	3.42	1.78	15
Chromium, Total	30	36	180	400	mg/kg	26.4	154	16.1	16.4	8.53	18.1
Copper, Total	50	270	270	270	mg/kg	25.2	29	12	12.4	10.8	57.4
Lead, Total	63	400	400	1000	mg/kg	10.4	14.4	5.2	4.52	4.95	1050
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	1.58	ND	ND	ND	0.535
Nickel, Total	30	140	310	310	mg/kg	39.8	35.4	129	126	87	24.3
Zinc, Total	109	2200	10000	10000	mg/kg	53.8	36.9	54.7	25	27.2	558
					CATION	S-40 (11-12)	S-40 (16-17)	S-40 (23-24)	S-40 (51-52)	S-41 SURFACE	S-41 (4-5)
				SAMPLIN		11/11/2020	11/11/2020	11/11/2020	11/11/2020	11/5/2020	11/5/2020
		SAMPI	E DEPTH	INTERVA	L (FEET)	11-12	16-17	23-24	51-52	0-1	4-5
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Chromium, Total	30	36	180	400	mg/kg	20.4	18.7	27.4	49.2	14.7	10.1
Lead, Total	63	400	400	1000	mg/kg	6.5	6.29	11.8	8.79	67.4	28.3
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	ND	ND	ND	0.13	0.749
Nickel, Total	30	140	310	310	mg/kg	30	41.2	40.6	54.9	22.2	8.49
Zinc, Total	109	2200	10000	10000	mg/kg	30.4	29.6	64.7	57.6	142	28.1
				LO	CATION	S-41 (7-8)	S-41 (12-13)	S-41 (17-18)	S-41 (21-22)	S-42 SURFACE	S-42 (3-4)
				SAMPLIN	NG DATE	11/5/2020	11/5/2020	11/11/2020	11/11/2020	11/5/2020	11/5/2020
		SAMPI	LE DEPTH	INTERVA	L (FEET)	7-8	12-13	17-18	21-22	0-1	3-4
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Chromium, Total	30	36	180	400	mg/kg	30.5	23.9	18.6	23.1	15.7	13.2
Lead, Total	63	400	400	1000	mg/kg	6.22	6.06	6.45	12.4	166	37.9
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	ND	ND	ND	0.227	0.196
Nickel, Total	30	140	310	310	mg/kg	66.4	49.9	76.6	50.8	19	11.2
				LC	CATION	S-42 (17-18)	S-42 (21-22)	S-42 (53-54)	S-43 SURFACE	S-43 (8-9)	S-43 (13-14)
				SAMPLIN	NG DATE	11/5/2020	11/5/2020	11/5/2020	11/9/2020	11/9/2020	11/9/2020
		SAMPI	LE DEPTH	INTERVA	L (FEET)	17-18	21-22	53-54	0-1	8-9	13-14
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Chromium, Total	30	36	180	400	mg/kg	34	23.2	14.2	30.6	12.1	21.2
Nickel, Total	30	140	310	310	mg/kg	48.6	42.7	95.8	75.7	35.3	70.8
				LO	CATION	S-43 (16-17)	S-43 (22-23)	S-44 SURFACE	S-44 (13-14)	S-44 (22-23)	S-44 (51-52)
				SAMPLIN	NG DATE	11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/9/2020	11/16/2020
		SAMPI	LE DEPTH	INTERVA	L (FEET)	16-17	22-23	0-1	13-14	22-23	51-52
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.601J	0.507J	7.5	0.609J	0.444J	0.43J
Chromium, Total	30	36	180	400	mg/kg	32.3	25	18.1	22.7	12.2	26.1
Copper, Total	50	270	270	270	mg/kg	27	25.1	62.4	24.3	13.2	24.9
Lead, Total	63	400	400	1000	mg/kg	12.6	8.52	283	13.3	3.26J	9.15
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	0.115	ND	0.395	ND	ND	ND
Nickel, Total	30	140	310	310	mg/kg	146	92.3	19.1	320	40	45.1
Zinc. Total	109	2200	10000	10000	mg/kg	47.2	48.4	4070	90	28.4	48.1
-,					CATION	S-45 (3-4)	S-45 (23-24)	S-45 (52-53)			
				SAMPLIN		11/10/2020	11/10/2020	11/12/2020			
		SAMPI	LE DEPTH		-	3-4	23-24	52-53			
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results			
Nickel. Total	30	140	310	310	mg/kg	39.5	62.2	127			
onoi, Total	- 00	1 70	010	010	mg/ng	00.0	UZ.Z	121	ı		

Notes:

S-44 (13-14) = Sample Location and Depth

ND = Compound Not Detected

J = Estimated Concentration

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Highlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

<u>Pesticides</u>

The pesticides 4,4-DDE and 4,4-DDT were detected at concentrations exceeding the USCO, but below the RSCO, RRSCO and CSCO. Pesticide exceedances were limited to two (2) borings, S-34 and S-39. Pesticide impacts were limited to the upper fill material and one deeper

exceedance to thirteen feet below ground surface at S-34. Pesticide exceedances are presented on Figure 2.2 and Table 2.3 as follows.

Table 2.3 Summary of Pesticides Exceeding the NYSDEC USCOs

				LOC	ATION	S-34 SURFACE	S-34 (4-5)	S-34 (7-8)	S-34 (13-14)	S-39 SURFACE	S-39 (2-3)
SAMPLING DATE						11/6/2020	11/6/2020	11/6/2020	11/6/2020	11/4/2020	11/4/2020
SAMPLE DEPTH INTERVAL (FEET)				0-1	4-5	7-8	13-14	0-1	2-3		
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	Results	Results	Results	Results	Results
4,4'-DDE	l'-DDE 0.0033 1.8 8.9 62 mg/kg		0.014	0.00648	0.00398	0.00424	0.0388IP	ND			
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	0.0236P	ND	0.00279J	ND	ND	0.00452

SB-14 3.5' = Sample Location and Depth Below Ground Surface

Bold = Compound Detected U = Compounds Not Detected

J = Estimated Concentration

Compound Exceeds NYSDEC USCO

Emerging Contaminants

PFOS was detected at concentrations exceeding the USCO, but below the RSCO, RRSCO, and CSCO. PFOS exceedances were limited to one (1) boring, S-39, and were identified in consecutive samples from surface and 2-3 ft-bgs. PFOS was not identified in exceedance of the USCO at deeper soil intervals. A summary of PFAS exceedances is presented on Figure 2.2 and Table 2.4 as follows.

Table 2.4 Summary of PFAS Exceeding the NYSDEC USCOs

	S-39 SURFACE	S-39 (2-3)								
	11/4/2020	11/4/2020								
	SAMPLE DEPTH INTERVAL (FEET)									
PFAs by Ispotope Dilution	Results	Results								
Perfluorooctanesulfonic Acid (PFOS)	0.00088	0.0088	0.044	0.440	mg/kg	0.00868	0.00138			

SB-39 (2-3) = Sample Location and Depth Below Ground Surface

Bold = Compound Detected U = Compounds Not Detected

Compound Exceeds NYSDEC USCO

VOCs

Acetone exceeded the NYSDEC USCO; however, no additional exceedances were observed and this occurrence is suspected to be a laboratory contaminant.

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

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

- The layer of historic fill at the Site is impacted above the USCOs, RSCOs, RRSCOs, and CSCOs. Vertical soil contaminant delineation was achieved during this RI for constituents that are not naturally occurring. The samples collected within native soils exhibited concentrations mostly below the USCOs, with the exception of naturally occurring compounds.
- PAHs were detected at concentrations which exceeded the USCOs, RSCOs, RRSCOs, and CSCOs across the Site in soil samples collected from grade and 5 ft. bgs. Historic/urban fill depths range between 8 and 12 ft bgs and correlates with PAH analytical results. Historic/urban fill or past site uses are the probable source of PAH contamination due to the absence of a clear trend across the Site.
- Pesticides at concentrations which exceeded the USCOs were detected in soils between surface and 14 ft. bgs and were limited to the western portion of the Site. Because of the limited presence of pesticides in exceedance of the USCOs, a pesticide source could not be identified.
- Metals were detected at concentrations which exceeded the USCOs, RSCOs, and RRSCOs and CSCOs across the Site in soil samples collected from grade to 14 ft. bgs. Historic fill depths up to twelve (12) ft. bgs correlate with these metal exceedances and is the source of metal contamination.
- Nickel and chromium were detected at concentrations in exceedance of the SCOs within
 the native soil material. Because these metals were detected within native material and to
 depths up to 52 feet, their presence were considered naturally occurring, which is
 consistent with our experience with soils in this area.
- Elevated concentrations of Lead in excess of 1,000 mg/kg were identified in one (1) Phase II ESA soil sample in the central portion of the Site, and one (1) RI soil sample in the western portion of the Site. No additional elevated concentrations exceeding the CSCOs were observed. Although Lead was detected across the Site, based on current data the elevated lead concentrations appear isolated to these two (2) locations.
- Two exceedances of PFOS were identified. The samples were located at boring S-39 from the surface and subsequent sample collected from 2-3 ft-bgs. Although detected at

elevated concentrations, no on-Site source or suspected historic use of PFOS was identified. Therefore, this exceedance is likely attributed to possible cross-contamination from surface runoff into soils and/or diffuse anthropogenic sources.

2.2 GROUNDWATER REMEDIAL INVESTIGATION FINDINGS

Eight (8) permanent groundwater monitoring wells identified as MW-1 to MW-8 were installed in November 2020 to characterize groundwater. Groundwater samples were analyzed for TCL+30/TAL, PFAS, and 1-4 dioxane. The depth of the wells ranged from 49 to 65 ft bgs. The depth of water table was recorded at an approximate depth of 45 ft bgs across the Site. 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.

VOCs

One (1) VOC, 1,2,4,5-tetramethylbenzene, was detected in groundwater in exceedance of the NYSDEC AWQS in MW-7. This compound was not detected in any of the remaining seven (7) wells. A summary of the VOC exceedances is presented on Figure 2.4 and Table 2.5 as follows.

Table 2.5 Summary of VOCs Exceeding the NYSDEC AWQS

LOC	MW-7	
SAMPLIN	11/24/2020	
	ug/l	
	AWQS	Results
Volatile Organics by GC/MS		
1,2,4,5-Tetramethylbenzene	5	8.4

Notes:

MW-7 = Monitoring Well Location **Bold** = Compound Detected

Compound Exceeds NYSDEC AWQS

Metals

Antimony, arsenic, beryllium, chromium, iron, lead, magnesium nickel, sodium and thallium were detected at levels that exceeded their AWQS in the monitoring wells as presented on Figure 2.4 and Table 2.6 below. With the exception of nickel and chromium which were detected in soils at the groundwater interface, these compounds were not detected at elevated concentrations. The compounds are suspected to be a result of natural background or may be the result of sample turbidity.

TABLE 2.6 Summary of Metals Exceeding the NYSDEC AWQS

LO	CATION	MW-1	MW-2	MW-3	MW-4	MW-5
SAMPLIN	G DATE	11/24/2020	11/24/2020	11/24/2020	11/24/2020	11/20/2020
	UNITS	ug/l	ug/l	ug/l	ug/l	ug/l
	AWQS	Results	Results	Results	Results	Results
Antimony, Total	3	4 U	40 U	0.68 J	0.47 J	0.69 J
Arsenic, Total	25	3.8	29.64	7.26	8.05	4.41
Beryllium, Total	3	0.42 J	4.27 J	0.76	0.8	0.34 J
Chromium, Total	50	64.44	237.6	118.7	210.7	23.42
Iron, Total	300	13400	87500	20200	22400	10900
Lead, Total	25	18.34	304	66.91	25.18	22.15
Magnesium, Total	35000	52200	109000	65200	54100	59100
Manganese, Total	300	3865	4910	1740	1745	791.9
Nickel, Total	100	71.73	617.2	157.4	211.4	81.83
Sodium, Total	20000	97500	88400	129000	52400	117000
Thallium, Total 0.5		0.19 J	10 U	0.28 J	0.31 J	0.19 J
LO	CATION	MW-6	MW-DUP-1	MW-7	MW-8	
SAMPLIN	G DATE	11/20/2020	11/20/2020	11/24/2020	11/24/2020	
	UNITS	ug/l	ug/l	ug/l	ug/l	
	AWQS	Results	Results	Results	Results	
Antimony, Total	3	0.62 J	4 U	4.71	4 U	
Arsenic, Total	25	1.87	1.77	16.39	3.05	
Beryllium, Total	3	0.11 J	0.12 J	2.14	0.25 J	
Chromium, Total	50	4.08	4.09	88.92	36.76	
Iron, Total	300	2840	2630	44700	7760	
Lead, Total	25	8.13	6.4	87.95	13.46	
Magnesium, Total	35000	66100	65400	96000	70800	
Manganese, Total	300	249.4	276.7	4284	949.1	
Nickel, Total	100	46.43	45.09	468	57.47	
Sodium, Total	20000	172000	167000	95600	137000	
Thallium, Total	0.5	0.14 J	0.5 U	0.95 J	1 U	

Notes:

MW-1 = Monitoring Well Location

Bold = Compound Detected

U = Compounds Not Detected

J = Estimated Concentration

Compound Exceeds NYSDEC AWQS

At the request of the NYSDEC, supplemental groundwater sampling was performed. Five (5) groundwater wells (MW-1, MW-2, MW-3, MW-7, and MW-8) were sampled during the supplemental March 2021 sampling event and were analyzed for dissolved TAL metals.

Magnesium, manganese, and sodium were detected at levels that exceeded their AWQS in the monitoring wells. The dissolved metals were attributed to natural background concentrations.

Table 2.7 Summary of Dissolved Metals Exceeding the NYSDEC AWQS

LOCATION		MW-1	MW-2	MW-3	MW-7	MW-8
SAMPLING DATE		3/19/2021	3/19/2021	3/23/2021	3/23/2021	3/19/2021
UNITS		ug/l	ug/l	ug/l	ug/l	ug/l
	NY-AWQS	Results	Results	Results	Results	Results
Magnesium, Dissolved	35000	55700	133000	53700	49300	63100
Manganese, Dissolved	300	2852	78.72	82.75	397.5	4.95
Nickel, Dissolved	100	13.57	6.44	8.28	16.59	8.17
Sodium, Dissolved	20000	106000	44800	142000	65800	137000

Notes:

MW-1 = Monitoring Well Location

Bold = Compound Detected

U = Compounds Not Detected

J = Estimated Concentration

Compound Exceeds NYSDEC AWQS

SVOCS

Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno)1,2,3-cd)pyrene were detected in groundwater in exceedance of the NYSDEC AWQS in all eight (8) groundwater monitoring wells as shown on **Figure 2.4** and **Table 2.8** below. Because a vertical delineation of these compounds was established within soil, the presence of these compounds is considered to be attributed to regional groundwater impacts. A summary of the SVOC exceedances is provided in the following table.

Table 2.8 Summary of SVOC Exceeding the NYSDEC AWQS

LO	MW-1	MW-2	MW-3	MW-4	
SAMPLING DATE		11/24/2020	11/24/2020	11/24/2020	11/24/2020
UNITS		ug/l	ug/l	ug/l	ug/l
	AWQS	Results	Results	Results	Results
Benzo(a)anthracene	0.002	0.05 J	1.4	5	0.05 J
Benzo(a)pyrene	0	0.05 J	1.3	4.9	0.04 J
Benzo(b)fluoranthene	0.002	0.08 J	1.8	6.4	0.06 J
Benzo(k)fluoranthene	0.002	0.03 J	0.52	2.4	0.03 J
Chrysene	0.002	0.05 J	1.2	4.4	0.04 J
Indeno(1,2,3-cd)pyrene	0.002	0.04 J	0.94	3.4	0.03 J
LOCATION		MW-5	MW-6	MW-7	MW-8

SAMPLIN	11/20/2020	11/20/2020	11/24/2020	11/24/2020	
UNITS		ug/l	ug/l	ug/l	ug/l
	AWQS	Results	Results	Results	Results
Benzo(a)anthracene	0.002	0.04 J	0.1 U	1	0.06 J
Benzo(a)pyrene	0	0.02 J	0.1 U	0.95	0.05 J
Benzo(b)fluoranthene	0.002	0.03 J	0.01 J	1.4	0.08 J
Benzo(k)fluoranthene	0.002	0.01 J	0.1 U	0.44	0.03 J
Chrysene	0.002	0.02 J	0.1 U	1	0.07 J
Indeno(1,2,3-cd)pyrene	0.002	0.02 J	0.01 J	0.71	0.04 J

Notes:

MW-1 = Monitoring Well Location

Bold = Compound Detected

U = Compounds Not Detected

J = Estimated Concentration

Compound Exceeds NYSDEC AWQS

Emerging Contaminants

PFAS concentrations were detected in 8 of 8 wells in exceedance of the GWQS and were limited to perfluorooctacnoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) only. PFOA concentrations exceeded the AWQS in 8 of 8 samples and PFOS concentrations exceeded the AWQS in 5 of 8 samples. The highest detection was identified in a sample collected from MW-2 where PFOA was detected at 111.0 nanograms per liter (ng/L). A summary of the PFAS exceedances is provided below.

Table 2.9 Summary of PFAS Exceeding the NYSDEC AWQS

LOC	MW-1	MW-2	MW-3	MW-4	
SAMPLING	11/24/2020	11/24/2020	11/24/2020	11/24/2020	
	ug/l	ug/l	ug/l	ug/l	
Perfluorinated Alkyl Acids AWQS		Results	Results	Results	Results
Perfluorooctanoic Acid (PFOA)	0.01	0.0812	0.0164	0.0824	0.0431
Perfluorooctanesulfonic Acid (PFOS) 0.01		0.0196	0.00699	0.0133	0.007
LOC	MW-5	MW-6	MW-7	MW-8	
SAMPLING	11/20/2020	11/20/2020	11/24/2020	11/24/2020	
	UNITS	ug/l	ug/l	ug/l	ug/l
Perfluorinated Alkyl Acids	AWQS	Results	Results	Results	Results
Perfluorooctanoic Acid (PFOA)	0.01	0.088	0.111	0.0629	0.0919
Perfluorooctanesulfonic Acid (PFOS) 0.01		0.0214	0.0162	0.00896	0.015

Notes:

MW-1 = Monitoring Well Location

Bold = Compound Detected

U = Compounds Not Detected

J = Estimated Concentration

Compound Exceeds NYSDEC AWQS

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

- The groundwater depth is approximately 45 ft. bgs and flows to the west as measured during the November 2020 RI. The geological strata consist of the fill layer, which extends to depths of up to 14 ft-bgs underlain with a native sand formation.
- Vertical delineation of impacted soil was completed, and migration of soil contamination is disrupted by approximately twenty-seven (27) feet of native compliant soil.
- An evaluation of total and dissolved metal concentrations indicates that suspended sediments and turbidity resulted in elevated concentration of metals in the unfiltered samples collected in November 2020.
- Although nickel exceeded the soil SCOs which intersected the water table, dissolved nickel was not identified in exceedance of the AWQS. Therefore, suspended sediments resulting in sample turbidity was attributed to the elevated metal concentrations in groundwater.
- PFOS and PFOA were detected in exceedance of the AWQS across the Site. The
 random distribution and relative depth to groundwater suggest the presence of
 regional PFAS impacts. Additionally, PFAS utilizing operations were not identified onSite and no further evaluation for PFAS is recommended.

2.3 SOIL VAPOR CONTAMINATION

Six (6) soil vapor samples (SV-5 to SV-10) were collected from temporary vapor points screened from 24-25 feet bgs. PCE and TCE exceeded the NYSDOH Soil Vapor Matrix Guidance Values. TCE was detected in SV-7 at a concentration of 1.57 ug/m, above matrix guidance value of 0.2 mg/kg. PCE was detected in SV-5, SV-6 and SV-7 and ranged between 6.07 ug/m3 to 7.12 ug/m3 above the matrix guidance value of 3 ug/m3. SV-5, SV-6 and SV-7 were located in the northern portion of the Site and may indicate a nearby off-Site source of chlorinated vapor encroachment. A summary of soil vapor exceedances is provided below.

Table 2.10 Summary of Soil Vapor Detections

	SV-5	SV-6	SV-7	
COLLE	CTION DATE:	11/12/2020	11/12/2020	11/12/2020
S	AMPLE DEPTH	25'	25'	25'
	DOH-SSC			
ANALYTE	(ug/m3)	Conc	Conc	Conc
Trichloroethene	0.2	ND	ND	1.57
Tetrachloroethene	3	7.12	6.67	6.07

Notes:

SV-5 = Soil Vapor Sampling Location ID

ND = Non-Detect

Bold = Constituent Detected Above Laboratory Minimum Detection Limit

Yellow Highlight - Exceeds NYSDOH SSC

As presented in **Table 2.10** previously, TCE was detected in SV-7 at a concentration of 1.57 ug/m. PCE was detected in SV-5, SV-6 and SV-7 and ranged between 6.07 ug/m3 to 7.12 ug/m3. SV-5, SV-6 and SV-7 were located in the northern portion of the Site and may indicate a nearby off-Site source of chlorinated vapor encroachment. It is also important to note that these contaminants were not identified in the RI.

2.4 GEOLOGICAL CONDITIONS

According to the 1970 Geologic Map of New York – Lower Hudson Sheet published by the University of the State of New York, the Site is underlain by coastal plain deposits of silty clay, sandy clay, sand, and gravel of upper cretaceous age. Soil borings were advanced by Structural Engineering Technologies (SET) during their geotechnical investigation in April 2019, as summarized above. Historic fill was observed immediately below ground surface extending to estimated depths up to 12 ft-bg. The fill material consisted of sand, silt, gravel, wood, cobbles, boulders and concrete. The fill material is underlain by coastal plain deposits of fine to coarse sand, with varying amounts of silt, gravel and cobbles. No bedrock was encountered in any of the borings, which reached a maximum depth of 102 ft-bg.

The depth to groundwater was measured at an approximate depth of 45 ft bgs. The groundwater gradient was determined to be in a westerly direction across the Site.

2.5 CONCEPTUAL SITE MODEL

The environmental investigation revealed that the Site is underlain with a layer of impacted historic/urban fill. Contaminants include PAHs, pesticides, and metals which exceed one or more of the applicable SCOs (USCOs, RSCOs, RRSCOs, and CSCOs) across the Site. PAH impacts

to soil exceeding the USCOs, RSCOs, RRSCOs, and CSCOs were identified to depths up to 5 ft. bgs, and metal impacts to soil exceeding the USCOs were identified at depths up to 14 ft bgs. Contaminants identified in native soils beneath the historic fill are suspected to be natural background.

The applicable standards criteria and guidance (SCGs) for the Site groundwater are the NYSDEC AWQS (cf. Section 703.5). VOCs, SVOCs, and metals were detected at concentrations exceeding the AWQS throughout the Site. Although a groundwater contaminant source was not identified within on-Site soil, vertical soil delineation of these compounds and an approximately 26-foot clean buffer of soil suggest the results to be associated with a regional contamination source.

Well gauging during the November 2020 RI and surveying data was used to determine groundwater at the site to flow in a westerly direction with an elevation of 5.82-6.37 ft-msl. This elevation corresponds to a depth of 45 ft bgs. The depth to groundwater should be expected to vary seasonally and with wet weather.

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 Brooklyn 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 1.1miles northeast of the Site.

Finally, although VOCs were detected in soil vapor, they were below the threshold that would be considered a concern relative to soil vapor intrusion into the future on-Site buildings and are considered to be associated with regional groundwater and soil vapor impacts. In addition, the building will be installed with a heavy waterproofing membrane which will also act as a vapor barrier. As such, no vapor mitigation is proposed as part of the remedial action.

2.6 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)
- CP-43 Groundwater Monitoring Well Decommissioning Policy (November 2009)
- Sampling, Analysis, and Assessment of Per-and-Polyfluoroalkyl Substances (October 2020).
- 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.

2.7 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.7.1 Qualitative Human Health Exposure Assessment

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

PAHs, pesticides and metal exceedances of the USCOs 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 without the implementation of the remedial action identified in this RAWP. The presence of nickel may require a Track 2 – Residential Cleanup Remedy. The implementation of the HASP and CAMP will also protect on-site remediation and construction workers and off-site receptors.

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 Brooklyn is not used for drinking water. Vertical soil contaminant delineation was achieved. Groundwater impacts were attributed to regional contamination. The groundwater will naturally attenuate with time and is not anticipated to be a pathway for human heath exposure.

The VOC levels in the Site soil vapors were identified above the applicable NYSDOH Matrices threshold concentrations. It is likely that these vapors are associated with offsite/regional contamination sources due to the lack of the soil vapor contaminants in the Site soils or groundwater. As such, no vapor mitigation is proposed as part of the remedial action.

2.7.2 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 Prospect Park Lake, is located

approximately 1.1 miles northeast of the Site.

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

2.8 REMEDIAL ACTION OBJECTIVES

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

2.8.1 Groundwater

RAOs for Public Health Protection

 Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

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

2.8.2 Soil

RAOs for Public Health Protection

Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

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

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The objective of the remedy, as needed for a commercial development, 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 be accomplished under a Track 2 – Residential Cleanup by achieving the USCOs for contaminants other than nickel; however, an EE or SMP will not be required.

Track 1

A remedy pursuant to this track must achieve compliance with the USCOs set forth in 6 NYCRR Table 375-6.8(a). This alternative would involve the complete removal and/or remediation of the soil with exceedances to the USCO, which were encountered up to 14 ft-bgs. 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, if it is determined that groundwater contamination originated from the Site, which is discussed in the next section. The groundwater remedial investigation identified low concentrations of VOCs, SVOCs, and metals exceeding the AWQS. Because vertical delineation of impacted soil was completed and migration of soil contamination is disrupted by approximately twenty-six (26) feet of native compliant soil, groundwater impacts in exceedance of the NYSDEC AWQS were attributed to regional impacts and/or are naturally occurring.

Low concentrations of VOCs in soil vapor were detected and were attributed to a regional contamination source(s). No remedial activity or mitigation system is proposed relative to soil vapor.

Conditional Track 1 or Track 2

In a conditional Track 1 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. 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 use, 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. Under a Track 2 – Residential Cleanup 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 – Residential Cleanup would involve excavation and disposal of the contaminated soils to 14 feet to meet the USCOs.

Soils on the Site will be excavated up to approximately 25 feet, however, the presence of nickel in exceedance of the USCOs will require a Track 2 - Residential cleanup remedy for soil. A groundwater monitoring well network would only be required for the Track 2 - Residential Cleanup remedy as an engineering control if it is determined that groundwater contamination originated from the Site.

Although naturally-occurring nickel concentrations in exceedance of the USCOs may be present following remediation, NYSDEC correspondence determined that an EE or SMP will not be required as institutional controls.

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 layer 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 cover in landscaped areas requires soil that meets the restricted use SCOs in the upper two feet by means of either soil removal or installation of the cover system. The system must consist of 24 inches of soil, with the upper six inches of soil of sufficient quality to maintain a vegetative Short and long-term IC and ECs are allowed to achieve protection of public health and the environment. A Track 4 remedy would consist of surface soil excavation of two feet and then a cover system over exposed residual soil contamination. Soils, which are not otherwise covered by structures such as buildings, sidewalks or pavement must be covered with 18 inches of soil that complies with the unrestricted or restricted residential SCOs and clean unrestricted topsoil in the top 6 inches.

Track 4 also includes a Site Management Plan (SMP) and Environmental Easement (EE) as institutional controls to ensure that all of the institutional and engineering controls are maintained, and any soil 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, groundwater and soil vapor. The no action alternative is thus unacceptable and has not been compared to the factors below and due to the proposed development at the Site.

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 aim to remove all soil contamination. Moreover, because a Track 1 remedy requires no long term ongoing institutional or engineering controls to manage contamination indefinitely into the future (other than possibly some short term soil vapor mitigation measures), the cleanup does not rely on human intervention or mechanical equipment to remain effective in protecting human health and the environment. A conditional Tack 1 or Track 2 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. A Track 4 remedy, if needed, would also be protective of human health and the environment with source removal, a proper cover system and implementation of the proper long-term engineering and institutional controls to be managed in an SMP.

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. A conditional Track 1, or 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, Conditional Track 1, and Track 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 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 requires ECs and ICs to ensure there is no exposure to residual contamination.

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 on Site, a properly maintained cover system is effective at eliminating the risk of dermal exposure and the planned soil vapor mitigation measures will also help to ensure lack of exposure to any remaining on-Site vapors.

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

Tracks 1 through 4 will reduce of toxicity and mobility. A Track 1, Conditional 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, Conditional Track 1, or Track 2 Site wide will be more costly than Track 4. 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. In addition, a Track 1 or 2 remedy should eliminate any on-Site soil source that maybe contributing to soil vapor issues at the Site. Therefore, a Track 1 or 2 remedy for the Site is cost effective.

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 a commercial storage facility. The community should accept any of the remedies, however, the Track 1, Conditional Track 1, or Track 2 remedy is likely preferable to the community since it will eliminate most of the contamination and prevent future off-Site issues.

Land use:

All cleanup tracks would achieve remediation for the planned commercial use of the Site. Developing the property will create short term construction impacts, but the creation of a new commercial storage facility will benefit the community.

Zoning: All of the proposed remedies under each track will facilitate the Site to be utilized for a proposed commercial 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 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.
- <u>Citizen Participation:</u> Citizen Participation during implementation of a remedial program will proceed in accordance with the Citizen Participation Plan included as Appendix C of this RAWP and as noted above will have minimal community impact. Any short-term impacts will be addressed by the CAMP and HASP.
- <u>Environmental justice concerns:</u> 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 commercial Track 2 will have very minimal restrictions on the future land use of the property. According to NYSDEC correspondence, a Track 2

 Residential Cleanup remedy will be required due to naturally occurring nickel concentrations in soil; however, these will not require long term monitoring under an EE or SMP.
- <u>Population growth patterns:</u> Any of the proposed remedies will not impact reasonably anticipated population growth patterns in the area other than to better accommodate growth by providing commercial self-storage.
- 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.
- <u>Proximity to natural resources:</u> The closest surface water body, a tributary of Prospect Park Lake, is located approximately 1.1 miles northeast of the Site. Storm water drainage patterns are generally consistent with the surrounding topography and primarily flow to the east.

Off-Site groundwater impacts: Evidence of regional groundwater impacts were identified during the RI.

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

<u>Current Institutional Controls:</u> There are no current institutional controls associated with the Site.

An institutional control may be required to address the long-term management of soil vapor remaining at the Site following remediation.

3.2 SELECTION OF THE PREFERRED REMEDY

The remedial alternatives analysis determined that a Track 2 – Residential Cleanup will be the goal for the Site.

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

A summary of the Track 2 – Residential Cleanup/remedial actions to address the impacts identified are discussed below:

- 1. Installation of a support of excavation (SOE) will be completed along the side walls of the entire property boundary for temporary structural stability of the excavations and to prevent impact to off-site structures. A soldier beam and lagging wall system with associated features will be installed to support the excavation of the on-site contaminated soil and contaminated historic fill. The support of excavation system will be installed under the Revised IRMWP prepared by SESI and submitted to NYSDEC on March 25, 2021, and which was approved by the NYSDEC on April 7, 2021. The SOE installation will be conducted as described in the March 2021 Revised Interim Remedial Measure Workplan.
- 2. Excavation of contaminated fill soil will be completed to an approximate depth of 15 ft-bgs. Further excavation of native soil containing natural concentrations of nickel, will excavated to an approximate depth of 25 ft-bgs as required for the proposed redevelopment. A Track 2 Residential Cleanup will be achieved by removal of the contaminated fill/soil. The department has indicated that nickel contamination is considered hazardous waste, which will be encountered at depths between 15 to 25 feet during supplemental excavation for Site redevelopment. The excavation and

disposal of the contaminated fill/soil, as well as, the underlying native soil, will be completed under the Revised IRMWP prepared by SESI and submitted to NYSDEC on March 25, 2021. The Revised IRMWP was which was approved by the NYSDEC on April 7, 2021.

- 3. Endpoint confirmatory sampling will be performed to assess post excavation conditions. Track 2 Residential conditions are anticipated following excavation. If possible, sidewall sampling will be implemented to document any remaining contamination at the property boundary.
- 4. Removal of the abandoned in place USTs is being completed during IRM activities. The UST removals are being conducted as described in the March 2021 Revised Interim Remedial Measure Workplan prepared by SESI, which was approved by the NYSDEC on April 7, 2021.
- 5. Natural occurring concentrations of nickel were detected in soil, and the presence of regional polycyclic aromatic hydrocarbons (PAHs) were identified in groundwater at the Site during the Remedial Investigation (RI). Remediation of the naturally-occurring nickel was determined to be technically impractical, and groundwater impacts were determined to be derived from an unknown off-Site source. Following the correspondence with the department regarding this matter, it was determined that the Nickel at the Site in the native soils is considered hazardous and that a Track 1 remedy will not be feasible; however, an Environmental Easement (EE), nor a Site Management Plan would be required under a Track 2 Residential Cleanup remedy for the Site.
- 6. As previously discussed, remediation of Nickel impacted soil is not technically practical as the Nickel is considered to be naturally occurring; however, the NYSDEC considers the Nickel to be hazardous. The NYSDEC determined that a EE or SMP would not be required based on the presence of Nickel. As per correspondence with the department a Track 2 Residential Cleanup will not require long term management of residual contamination, an EE or SMP as they pertain to future phases of construction, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) soil excavation and (4) reporting;

- 7. 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;
- 8. Import of backfill materials during redevelopment construction activities, to be used for backfill and soil cover, if necessary, must be in compliance with: (1) chemical limits and other specifications included in NYCRR Sections 375-6.7(d) and 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;
- 9. 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.

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 Final Engineering Report (FER). **Figure 5.1** and **5.1A** present remediation area for a Track 2 – Residential Cleanup.

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 will also include 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

SNL XXII, LLC is the BCP Volunteer and redeveloper of the Site. SESI is the environmental consultant for SNL XXII, 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
Grady Humphrey & Philip Lepine	SNL XXII, LLC	Volunteer Contact	3333 New Hyde Park Road, Suite 200, Lake Success, NY 11042	(516) 472-7880
Justin M. Protasiewicz, PE	SESI Consulting Engineers, P.C.	Environmental Consultant's Project Manager	12A Maple Avenue Pine Brook, NJ 07058	(973) 808-9050
Justin M. Protasiewicz, PE	SESI Consulting Engineers, P.C.	Remedial Engineer	12A Maple Avenue Pine Brook, NJ 07058	(973) 808-9050
Steven Walsh	NYSDEC	Project Manager	625 Broadway, Albany, NY 12233	(518) 402-9824

4.2.2 Remedial Engineer

The Remedial Engineer for this project will be Justin M. Protasiewicz, 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 1440-1460 39th Street Site (Site No. C224311). 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	
Revised RIR Submission	June 2021	
IRMWP Submission	March 2021	
IRMWP Approval	April 2021	
RAWP Submission	June 2021	
45-day Public Comment Period for RAWP is Initiated	July 2021	
Public Comment Period for RAWP Ends	September 2021	
NYSDEC Approves RAWP and Issues Decision Document	September 2021	
Complete Remedial Action	September 2021	
Draft Final Engineering Report (FER), Submit FER to NYSDEC and SMP (if required)	September 2021	
Certificate of Completion is Issued	December 2021	

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the City of Brooklyn 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	
One can contor.	(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	
Justin M. Protasiewicz – Remedial Engineer	(973) 808-9050	
(SESI Consulting Engineers)	(0.0,000	
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 Support of Excavation

A SOE system consisting of soldier beams and lagging and other associated features will be installed prior to excavation activities during the IRM.

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 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 45 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

A tracking pad will be required for any vehicles going off-site that have come in contact with on-site soils. The decontamination area construction and operational requirements are provided in the HASP. All vehicle 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;
- 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;
- A description of any CAMP exceedances recorded, and actions taken to remedy any
 exceedances. In addition to the weekly reporting, any CAMP exceedances recorded
 will reported to the NYSDEC and NYSDOH project managers on a daily basis; and
- A description of CAMP noise, odor, and/or vibration complaints will be reported to the NYSDEC and NYSDOH project managers on a daily basis.

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 and 5.1A**.

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. All Site soils will be excavated to 15 ft-bgs within the final SOE boundary as required to achieve the Track 2 – Residential Cleanup remediation. The excavation will be advanced to 25 ft-bgs for construction purposes. Endpoint verification sampling every 900 square feet (SF) will then be implemented, verified and documented by field personnel. Sidewall samples per DER-10 requirements will not be possible because of the SOE that will be placed along the Site boundaries and the proposed removal of Site soils to the property lines. However, when possible within the Site during interim excavations, such as UST excavations, side wall sampling will be implemented to document any contamination present in the excavation. Documentation will be presented in the FER.

5.2.2 Groundwater Sampling

One additional round of groundwater sampling will be conducted in order to further demonstrate groundwater flow direction and to verify that no groundwater remedy is required.

5.2.4 Methodology

Soil samples will be collected in accordance with the QAPP using disposable gloves/trowels or dedicated, decontaminated stainless steel spoons. Any additional groundwater samples required will be collected in accordance with the QAPP using the low-flow purging and sampling (LFPS) method and associated decontamination and quality control procedures.

5.2.5 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).

5.2.6 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**. Duplicate samples associated with daily sampling activities will be collected as a part of the QA/QC practices. Field blanks will be collected if non-disposable sampling equipment is utilized. Trip blanks will accompany all aqueous TCL VO samples.

5.2.7 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.

5.2.8 Reporting of End-Point Data in FER

The FER will include a table of final soil and groundwater sample data with highlights or a summary of exceedances of the USCOs and AWQS.

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. A post excavation sampling plan is shown in **Figure 5.1**, where the grids are 30 by 30 feet. Post excavation samples will be collected from center of each grid as the excavation proceeds. The results will be shared with the NYSDEC in the weekly report. 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 completed accordance with the Interim Remedial Measures Work Plan (IRMWP), which was approved by the NYSDEC on April 7, 2021, and during redevelopment activities within the proposed building footprint. Based on the RI, the depth of fill/soil contamination at the Site extends to an approximate depth of 12 to 14 ft bgs. The Site will be excavated to depths up to 14 ft bgs. No backfilling is anticipated. Following the completion of the remedial excavations and subsequent excavations to the proposed elevation of the development subgrade, end-point remedial performance sampling will be completed to ensure the Site meets USCOs or RRSCO before the Site development is constructed.

The estimated quantity of soil/fill to be removed from the Site is approximately 7,000 CY. The actual excavated volume will be reported in the Final Engineering Report (FER) as a tally of the manifests and tickets of the contaminated soils disposed off-site at regulated facilities. An estimated 16,000 additional CY of soil will be removed during construction related excavation.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

Source removal excavation activities will be implemented during the course of the remediation activities throughout the footprint of the Site. Based on the RI, the depth of contaminated fill/ soil was observed to depths up to 14 ft-bgs depth. The entire Site within the SOE will be excavated to remove all soil exceedances, with the exception of naturally occurring nickel, in order to achieve a Track 2 – Residential Cleanup remedy. Endpoint and sidewall sampling will document remaining soil conditions. Backfilling is expected to be needed in certain of areas on the Site.

The estimated quantity of contaminated soil/fill to be removed from the Site is 7,000 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.

5.4.1 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 7,000 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 was 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.

5.4.6 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.

5.4.7 Demarcation

A land survey will be performed by a New York State licensed surveyor, of the Site if a conditional 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.

5.4.8 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 October 2020 Sampling, Analysis and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) guidance document.

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. 5.4.9 Contingency Plan

If additional 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.

5.4.10 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.

5.4.11 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

No long-term engineering controls are proposed for the Site based on the results of the Remedial Investigation and the IRM work completed to date.

7.0 INSTITUTIONAL CONTROLS

It is not anticipated that the Site will require any Institutional Controls (ICs) based on the results of the Remedial Investigation and the IRM work completed to date.

7.1 ENVIRONMENTAL EASEMENT

Based on recent correspondence with the NYSDEC, a Track 2 – Residential Cleanup is anticipated for the project, which will not require an EE or SMP. If it is determined that a conditional Track 2 remedy is required based on the results of the remediation, then engineering controls (EC) (i.e. groundwater monitoring well network) and institutional controls (IC) for groundwater would 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.

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

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.

7.2 SITE MANAGEMENT PLAN

Based on recent correspondence with the NYSDEC, a Track 2 – Residential Cleanup is anticipated for the project, which will not require an EE or SMP. If a conditional Track 2 remedy is required at the Site based on the results of the remediation, then a SMP 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, 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.

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 Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 2002, 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.

No exclusions for handling of any residual contaminated soils will be provided in the Site SMP. All handling of any residual contaminated material above Track 1 if Track 1 has not been achieved throughout the entire Site footprint may 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 Justin M. Protasiewicz 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.



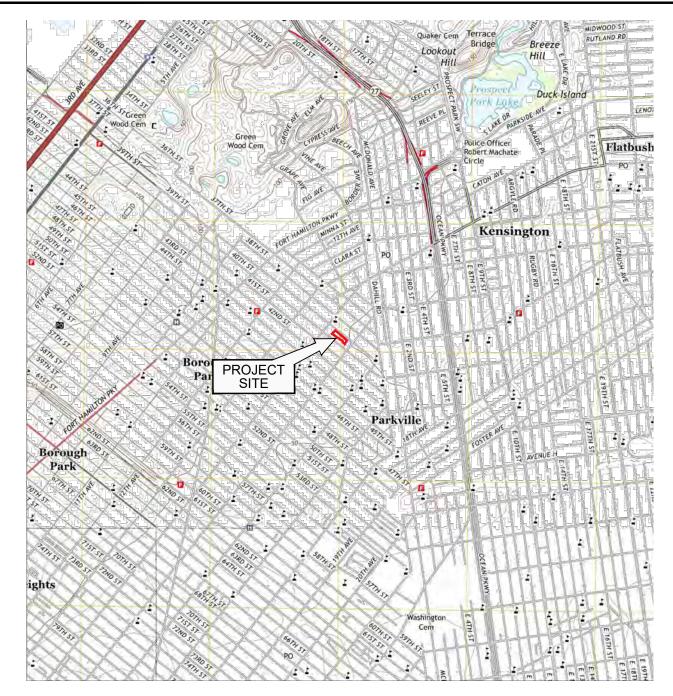
PLAN.DWG 11/30/20 09:07:55AM, aas, LAYOUT:FIG-1.1

LOCATION

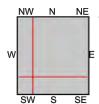
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FIG-1.1 -

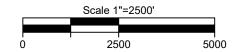
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This report includes information from the following map sheet(s).



TP, Brooklyn, 2013, 7.5-minute SE, Coney Island, 2013, 7.5-minute SW, The Narrows, 2013, 7.5-minute NW, Jersey City, 2014, 7.5-minute



1440-1460 39TH STREET BLOCK 5346; LOTS 17, 26, 28, 149 BROOKLYN, 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

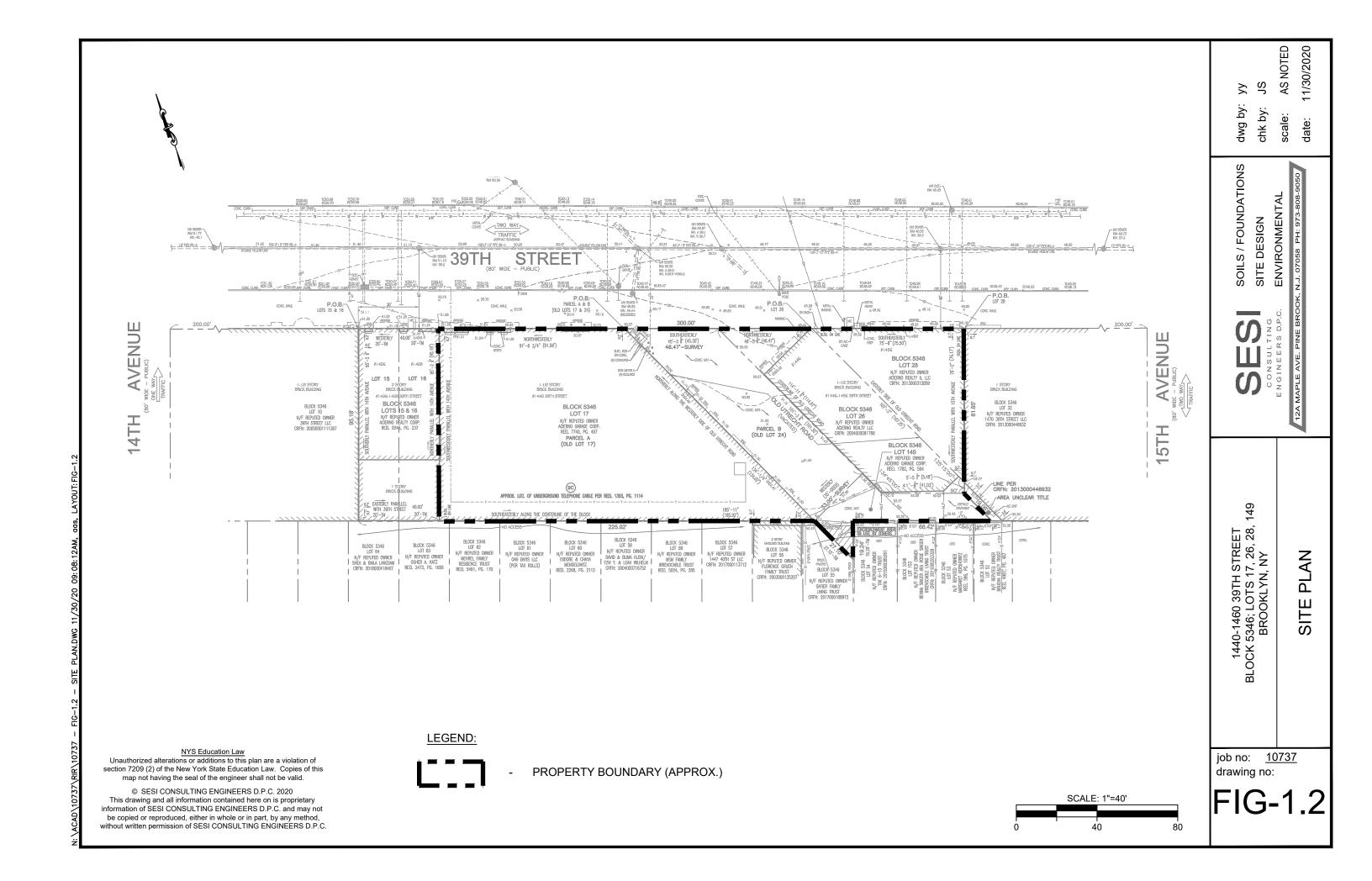
DRAWN BY: yy

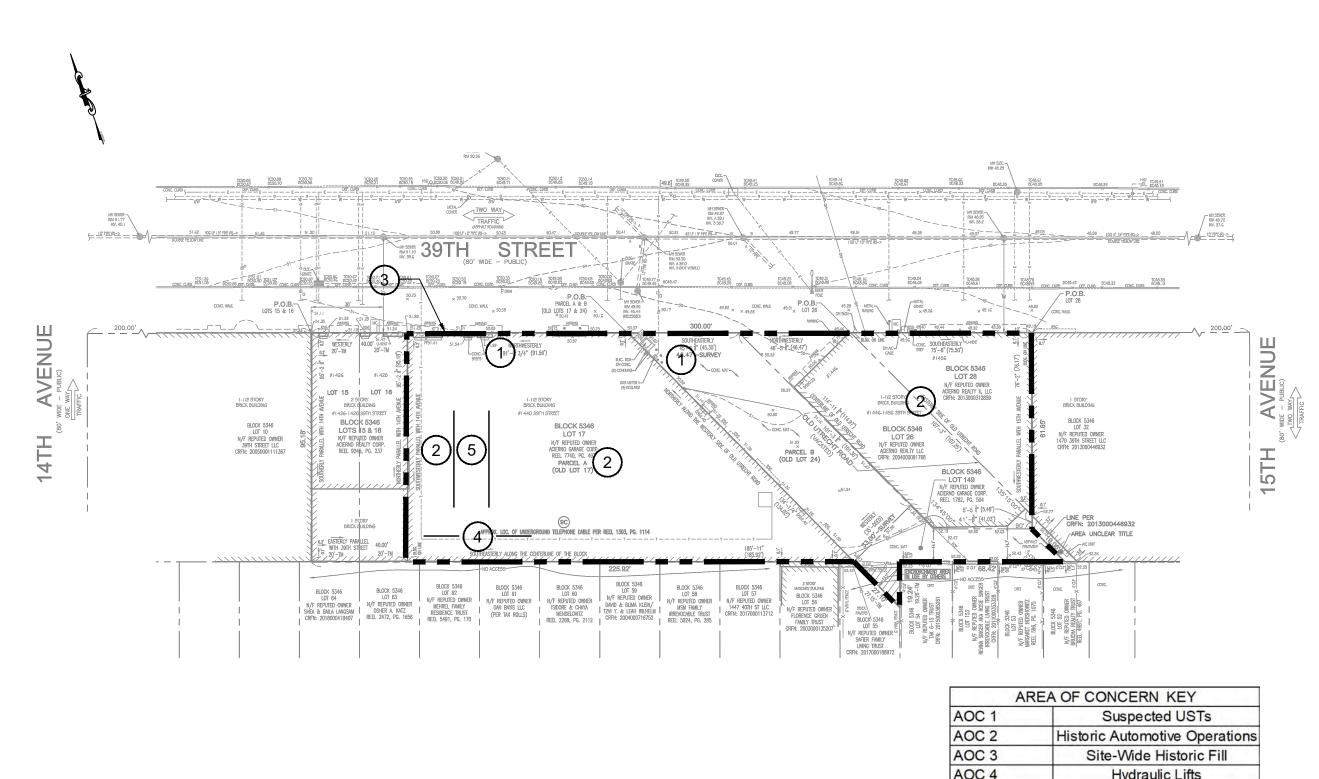
CHECKED BY: TTK

SCALE: AS NOTED

DATE: 11/30/2020

JOB NO.: 10737





AOC 4 Hydraulic Lifts AOC 5 Floor Drains

NYS Education Law

Unauthorized alterations or additions to this plan are a violation of section 7209 (2) of the New York State Education Law. Copies of this map not having the seal of the engineer shall not be valid.

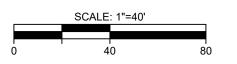
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LEGEND:

PROPERTY BOUNDARY (APPROX.)



AREA OF ENVIRONMENTAL CONCERN



PLAN **OPERATIONS / AOC** 1420-1460 39TH STREET BLOCK 5346; LOTS 17, 26, 28, 149 BROOKLYN, NY HISTORIC

AS NOTED

scale:

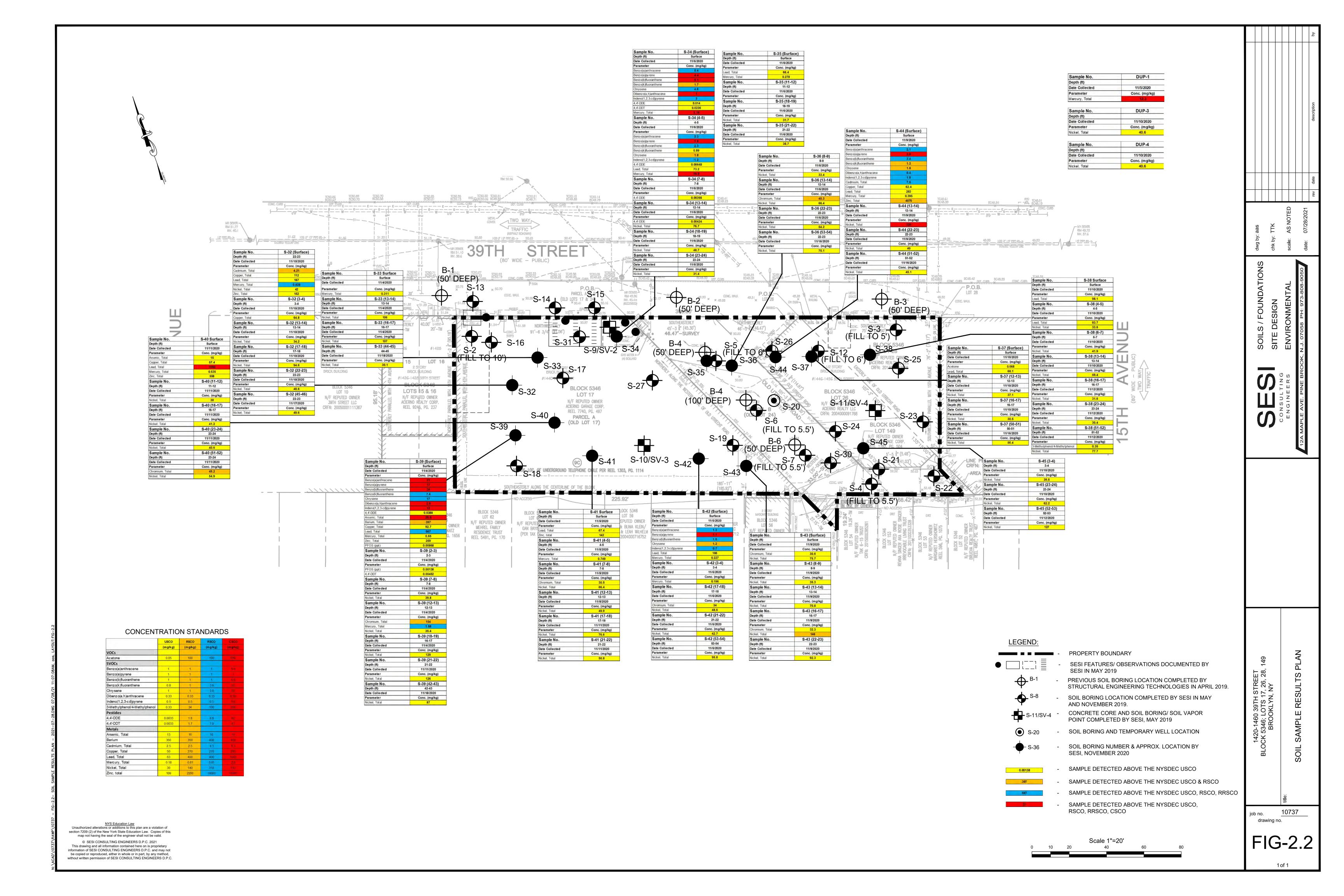
ENVIRONMENTAL SITE DESIGN

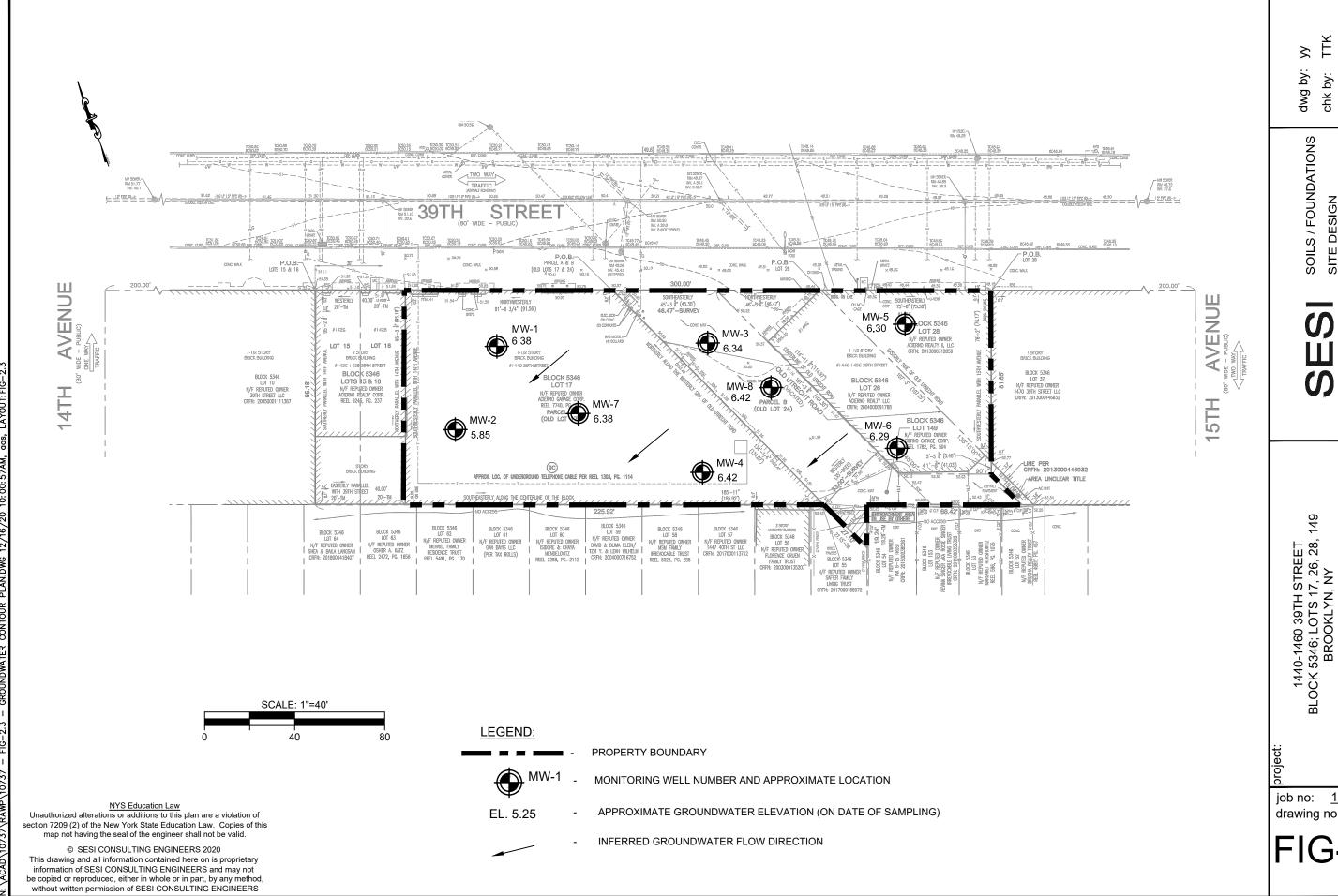
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SOILS / FOUNDATIONS

job no: <u>10737</u> drawing no:

FIG-2.1





AS NOTED 12/16/2020 scale: date:

chk by:

SOILS / FOUNDATIONS

ENVIRONMENTAL SITE DESIGN

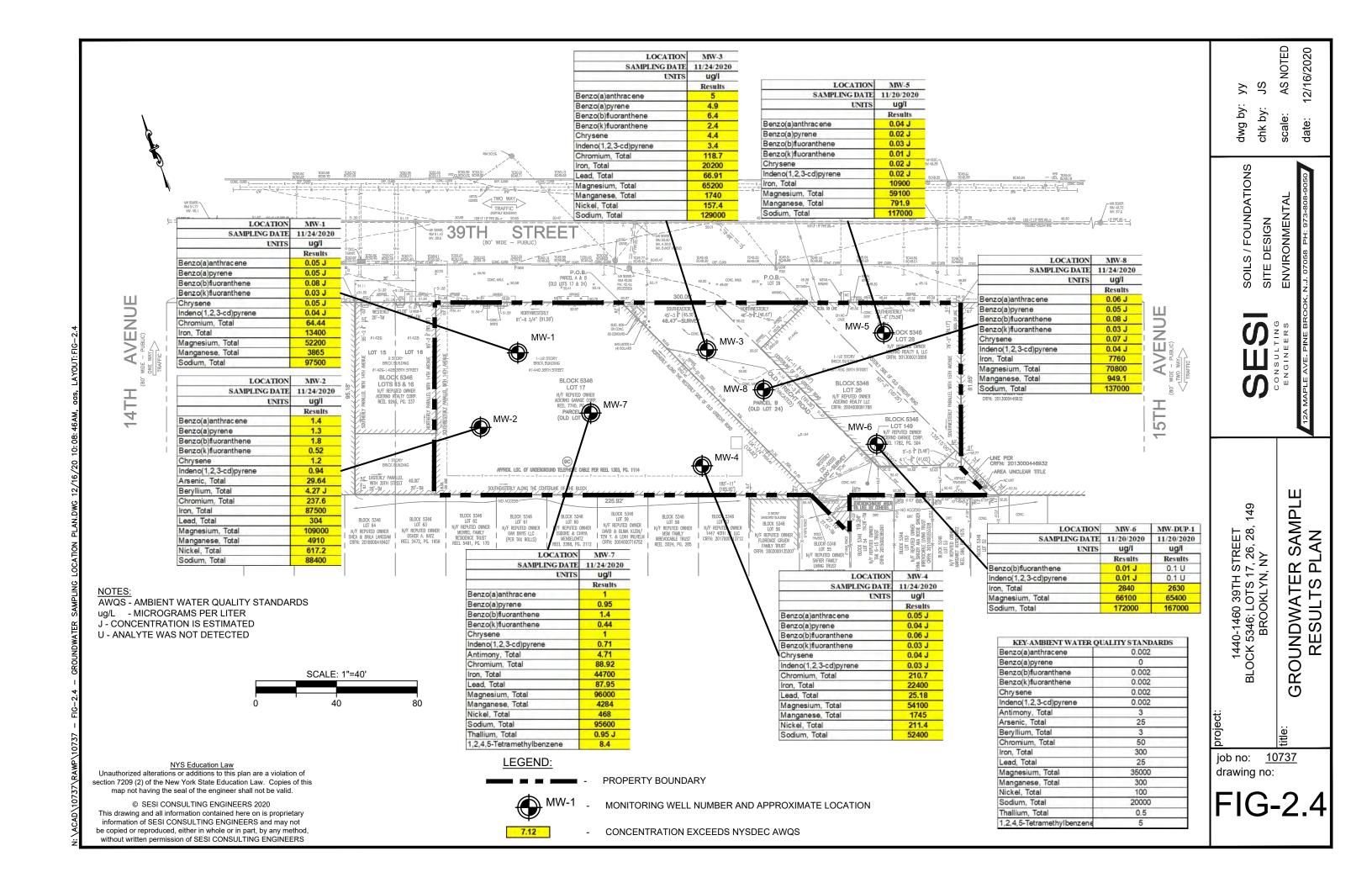
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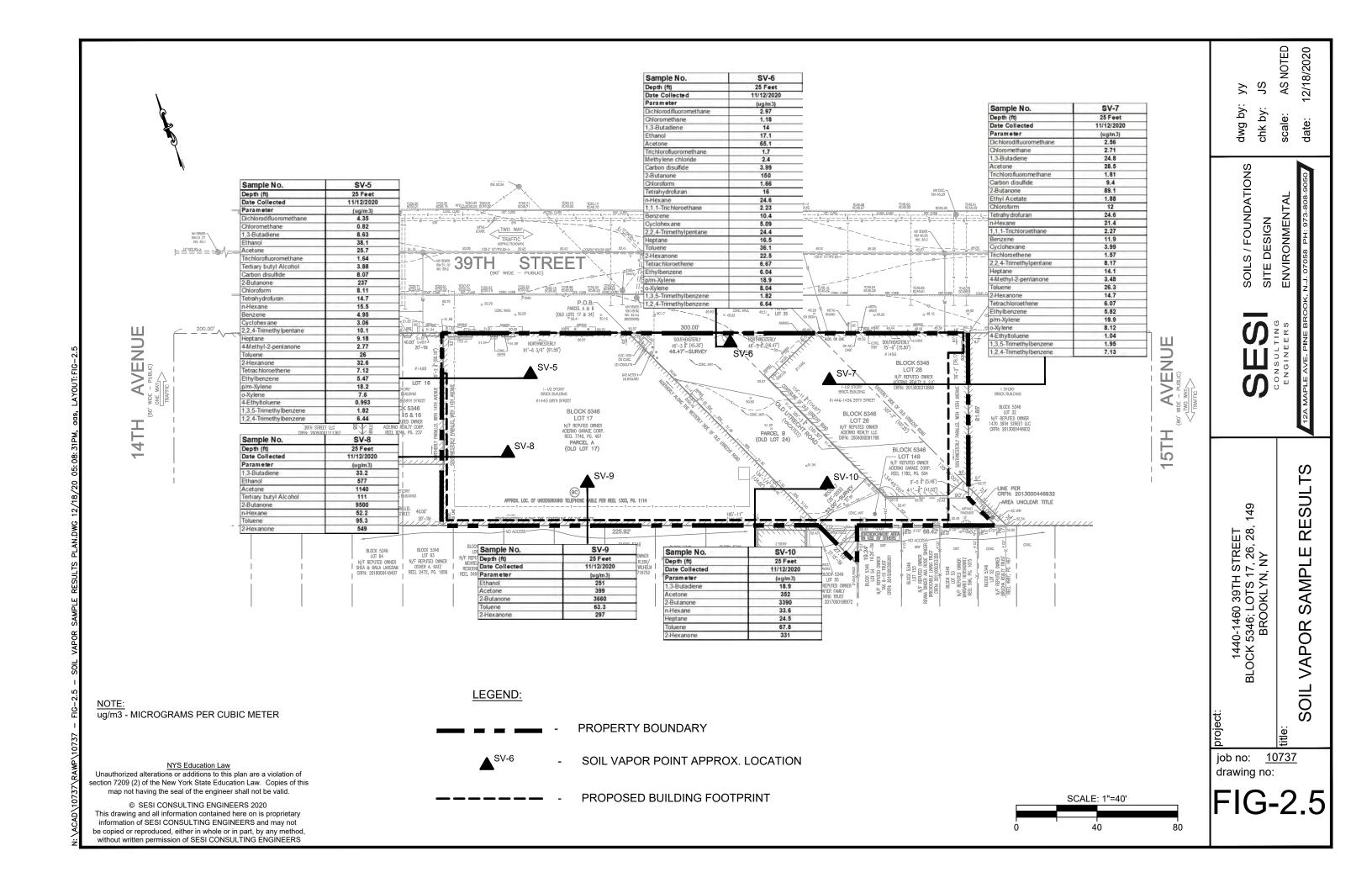
2020

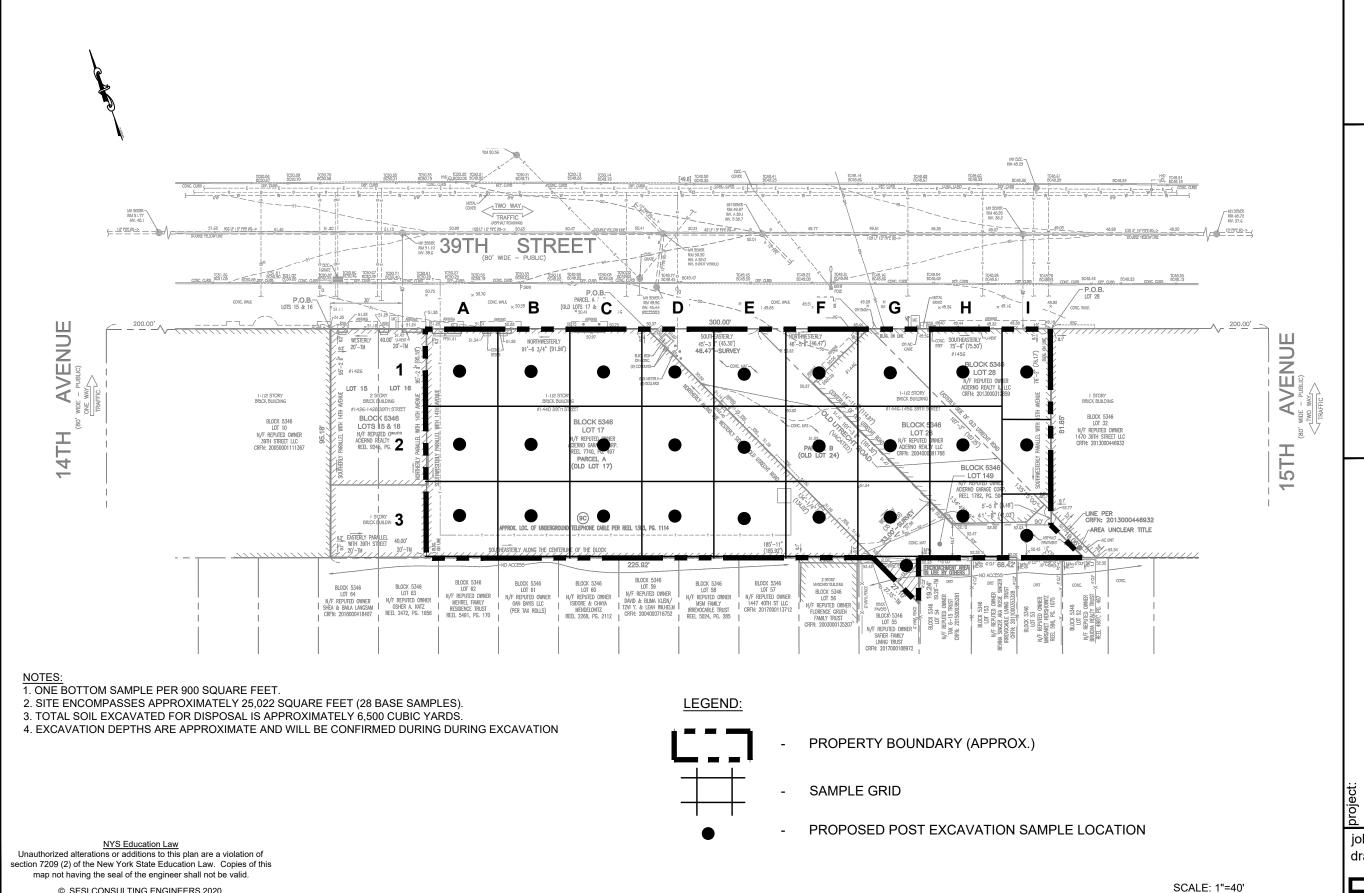
NOVEMBER

job no: <u>10737</u> drawing no:

FIG-2.3







SITE INFORMATION TAKEN FROM "ALTA/ACSM LAND TITLE SURVEY" PREPARED BY GALLAS

SURVEYING GROUP. DATED 04-01-2019, REV. 09-06-2019.

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chk by: JS scale: AS NOTE

dwg by: yy

SOILS / FOUNDATIONS

SITE DESIGN

G ENVIRONMENTAL

SOURCE SO

M o o o o o

EXCAVATION SAMPLING PLAN

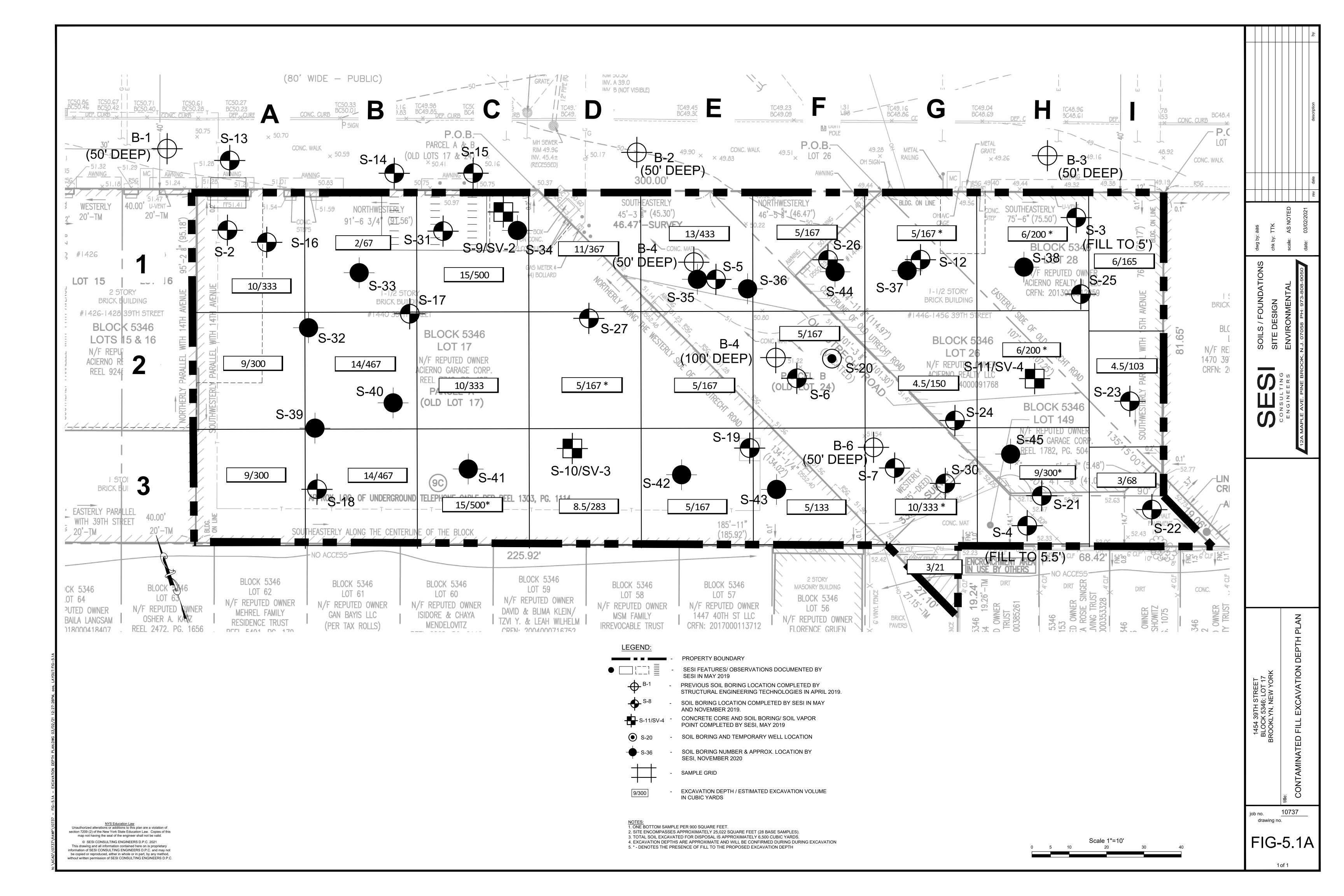
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1440-1460 39TH STREET BLOCK 5346; LOTS 17, 26, 28, 149 BROOKLYN, NY e:

job no: 10737 drawing no:

FIG-5.1



TABLES

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

					OCATION	~ ~ -	RFACE	S-32	()	S-32	(* .)	S-32 (/	S-32 (~ ((22-23)	~	(45-46)	~	RFACE		(4-5)
				SAMPLI	-	11/10		11/10		11/10		11/10			0/2020		0/2020		7/2020		/2020		/2020
		GARA	E DEDUK		MPLE ID	L2049		L2049		L2049			628-04		628-05		628-06		1011-03		3489-05		489-06
		SAMPI	LE DEPTH	INTERVA		-	<u>-1</u>	3-	-	6.	-		-14		-18	22			5-46		-1		-5
VOC- by FRA 5025	TIGGO	DCCO	DDCCO		PLE TYPE	SC		SO		SO		SC			<u>DIL</u>	SC			OIL	SC)IL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL 0.0044	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL 0.0052	Results	RL 0.0054
Methylene chloride	0.05	51	100	240	mg/kg	ND	0.0062	ND	0.0056	ND		ND	0.0071	ND	0.0052	ND	0.0052	ND	0.0056	ND	0.0053	ND	0.0054
1,1-Dichloroethane Chloroform	0.27	19 10	26 49	240	mg/kg	ND ND	0.0012	ND ND	0.0011	ND ND	0.00088	ND ND	0.0014	ND ND	0.001 0.0016	ND ND	0.001 0.0015	ND ND	0.0011 0.0017	ND	0.0011	ND ND	0.0011
0.11.21.21.111		1.4	2.4	350	mg/kg	ND ND	0.0019 0.0012	ND ND	0.0017	ND ND	0.0013		0.0021 0.0014	ND ND		ND ND	0.0015	ND ND	0.0017	ND ND	0.0016	ND ND	0.0016
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg		0.0012		0.0011			ND			0.001 0.001	ND ND	0.001		0.0011	ND	0.0011		0.0011
1,2-Dichloropropane					mg/kg	ND	*****	ND	0.0011	ND	0.00088	ND	0.0014	ND				ND		ND	0.0011	ND	0.0011
Dibromochloromethane					mg/kg	ND ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND ND	0.001	ND	0.0011	ND	0.0011	ND ND	0.0011
1,1,2-Trichloroethane	4.0		40	450	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND ND	0.00054
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
Trichlorofluoromethane	0.00	0.0	0.4	20	mg/kg	ND	0.005	ND	0.0044	ND	0.0035	ND	0.0057	ND	0.0042	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0043
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
Bromodichloromethane					mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
trans-1,3-Dichloropropene					mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
cis-1,3-Dichloropropene					mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
1,3-Dichloropropene, Total					mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
1,1-Dichloropropene					mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
Bromoform					mg/kg	ND	0.005	ND	0.0044	ND	0.0035	ND	0.0057	ND	0.0042	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0043
1,1,2,2-Tetrachloroethane					mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
Toluene	0.7	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Chloromethane					mg/kg	ND	0.005	ND	0.0044	ND	0.0035	ND	0.0057	ND	0.0042	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0043
Bromomethane	0.00	0.04	0.0	4.0	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Chloroethane	0.00	400	400	500	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
trans-1,2-Dichloroethene	0.19	100	100	500	mg/kg	ND	0.0019	ND	0.0017	ND	0.0013	ND	0.0021	ND	0.0016	ND	0.0015	ND	0.0017	ND	0.0016	ND	0.0016
Trichloroethene	0.47	10	21	200	mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND ND	0.0022
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
p/m-Xylene	0.26	100	100	500	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
o-Xylene	0.26	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Xylenes, Total	0.26	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
1,2-Dichloroethene, Total					mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Dibromomethane					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
Styrene					mg/kg	0.0012	0.0012	0.00089J	0.0011	0.00084J	0.00088	0.0014	0.0014	0.0011	0.001	0.0011	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Dichlorodifluoromethane	0.07	400	400		mg/kg	ND	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011
Acetone	0.05	100	100	500	mg/kg	0.0087J	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011
Carbon disulfide					mg/kg	ND	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011
2-Butanone	0.12	100	100	500	mg/kg	ND	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011
Vinyl acetate					mg/kg	ND	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011
4-Methyl-2-pentanone					ma/ka	ND	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011

				LC	CATION	S-32 SU	RFACE	S-32	(3-4)	S-32	(6-7)	S-32 (13-14)	S-32	(17-18)	S-32 (22-23)	S-32	(45-46)	S-33 SU	RFACE	S-33	(4-5)
				SAMPLI	NG DATE	11/10		11/10	()	11/10	(- /	11/10	- /		0/2020	11/10		2	7/2020	2 2	/2020	11/4/	(/
				LAB SA		L2049			628-02	L2049		L2049		,	0628-05	L2049			011-03	L2048		L20484	
		SAMPI	LE DEPTH		<u> </u>	0-		3		6		13-			7-18	22.			-46	0			-5
		0.22			LE TYPE	SO		SC		SC	-	SO			OIL	SO	_		DIL	SC	_	SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL																
1.2.3-Trichloropropane					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
2-Hexanone					mg/kg	ND	0.012	ND	0.011	ND	0.0088	ND	0.014	ND	0.01	ND	0.01	ND	0.011	ND	0.011	ND	0.011
Bromochloromethane					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
2,2-Dichloropropane					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,2-Dibromoethane					mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
1,3-Dichloropropane					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00062	ND	0.00056	ND	0.00044	ND	0.00071	ND	0.00052	ND	0.00052	ND	0.00056	ND	0.00053	ND	0.00054
Bromobenzene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
o-Chlorotoluene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
p-Chlorotoluene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0038	ND	0.0033	ND	0.0026	ND	0.0042	ND	0.0031	ND	0.0031	ND	0.0034	ND	0.0032	ND	0.0032
Hexachlorobutadiene					mg/kg	ND	0.005	ND	0.0044	ND	0.0035	ND	0.0057	ND	0.0042	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0043
Isopropylbenzene					mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
p-Isopropyltoluene					mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
Naphthalene	12	100	100	500	mg/kg	ND	0.005	ND	0.0044	ND	0.0035	ND	0.0057	ND	0.0042	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0043
Acrylonitrile					mg/kg	ND	0.005	ND	0.0044	ND	0.0035	ND	0.0057	ND	0.0042	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0043
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0012	ND	0.0011	ND	0.00088	ND	0.0014	ND	0.001	ND	0.001	ND	0.0011	ND	0.0011	ND	0.0011
1,2,3-Trichlorobenzene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,2,4-Trichlorobenzene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.1	ND	0.089	ND	0.07	ND	0.11	ND	0.084	ND	0.082	ND	0.09	ND	0.085	ND	0.086
p-Diethylbenzene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
p-Ethyltoluene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
Ethyl ether					mg/kg	ND	0.0025	ND	0.0022	ND	0.0018	ND	0.0028	ND	0.0021	ND	0.0021	ND	0.0022	ND	0.0021	ND	0.0022
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0062	ND	0.0056	ND	0.0044	ND	0.0071	ND	0.0052	ND	0.0052	ND	0.0056	ND	0.0053	ND	0.0054

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO
Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Highlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	OCATION	S-33	(6-7)	S-33 ((13-14)	S-33	(16-17)	S-33	(22-23)	S-33 (44-45)	S-34 SU	JRFACE	S-34	(4-5)	S-34	(7-8)	S-34 (13-14)
				SAMPLI	NG DATE	11/4/2	2020	11/4	/2020	11/4	/2020	11/1	2/2020	11/17	/2020	11/6	/2020	11/6	/2020	11/6	/2020	11/6/	2020
				LAB SA	MPLE ID	L20484	189-07	L2048	489-08	L2048	3489-09	L205	0225-01	L2051	011-02	L2049	113-01	L2049	0113-02	L2049	113-03	L2049	113-04
		SAMP	LE DEPTH	INTERVA	L (FEET)	6-	7	13	-14	16	5-17	2:	2-23	44-	-45	0	-1	4	l-5	7	-8	13-	-14
				SAMP	PLE TYPE	so	IL	SC	OIL	S	OIL	S	OIL	SO	OIL	SC	OIL	SC	OIL	SC	OIL	SO	IL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.005	ND	0.0048	ND	0.0052	ND	0.0062	ND	0.0048	ND	0.0065	ND	0.0063	ND	0.0049	ND	0.0053
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Chloroform	0.37	10	49	350	mg/kg	ND	0.0015	ND	0.0014	ND	0.0016	ND	0.0018	ND	0.0014	ND	0.0019	ND	0.0019	ND	0.0014	ND	0.0016
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
1,2-Dichloropropane					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Dibromochloromethane					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
1,1,2-Trichloroethane					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Trichlorofluoromethane					mg/kg	ND	0.004	ND	0.0039	ND	0.0042	ND	0.0049	ND	0.0038	ND	0.0052	ND	0.0051	ND	0.0039	ND	0.0043
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Bromodichloromethane					mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
trans-1,3-Dichloropropene					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
cis-1,3-Dichloropropene					mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
1,3-Dichloropropene, Total					mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
1,1-Dichloropropene					mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Bromoform					mg/kg	ND	0.004	ND	0.0039	ND	0.0042	ND	0.0049	ND	0.0038	ND	0.0052	ND	0.0051	ND	0.0039	ND	0.0043
1,1,2,2-Tetrachloroethane					mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	0.00023J	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Toluene	0.7	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Ethylbenzene	1	30	41	390	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	0.00021J	0.0013	ND	0.00097	ND	0.0011
Chloromethane					mg/kg	ND	0.004	ND	0.0039	ND	0.0042	ND	0.0049	ND	0.0038	ND	0.0052	ND	0.0051	ND	0.0039	ND	0.0043
Bromomethane					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Chloroethane					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
trans-1,2-Dichloroethene	0.19	100	100	500	mg/kg	ND	0.0015	ND	0.0014	ND	0.0016	ND	0.0018	ND	0.0014	ND	0.0019	ND	0.0019	ND	0.0014	ND	0.0016
Trichloroethene	0.47	10	21	200	mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
p/m-Xylene	0.26	100	100	500	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	0.0012J	0.0025	ND	0.0019	ND	0.0021
o-Xylene	0.26	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	0.00094J	0.0013	ND	0.00097	ND	0.0011
Xylenes, Total	0.26	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	0.0021J	0.0013	ND	0.00097	ND	0.0011
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
1,2-Dichloroethene, Total					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Dibromomethane					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
Styrene					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Dichlorodifluoromethane					mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	ND	0.0096	ND	0.013	ND	0.013	ND	0.0097	ND	0.011
Acetone	0.05	100	100	500	mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	0.0051J	0.0096	0.016	0.013	ND	0.013	ND	0.0097	0.012	0.011
Carbon disulfide					mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	ND	0.0096	ND	0.013	ND	0.013	ND	0.0097	ND	0.011
2-Butanone	0.12	100	100	500	mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	ND	0.0096	ND	0.013	ND	0.013	ND	0.0097	ND	0.011
Vinyl acetate					mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	ND	0.0096	ND	0.013	ND	0.013	ND	0.0097	ND	0.011
4-Methyl-2-pentanone					mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	ND	0.0096	ND	0.013	ND	0.013	ND	0.0097	ND	0.011

				LO	CATION	S-33 ((6-7)	S-33 (13-14)	S-33 (16-17)	S-33	(22-23)	S-33 (44-45)	S-34 SU	RFACE	S-34 ((4-5)	S-34	1 (7-8)	S-34 (1	13-14)
				SAMPLIN	NG DATE	11/4/2	2020	11/4	/2020	11/4	/2020	11/12	2/2020	11/17	7/2020	11/6/	2020	11/6/2	2020	11/6	5/2020	11/6/	2020
				LAB SA	MPLE ID	L20484	189-07	L2048	489-08	L2048	489-09	L2050	0225-01	L2051	011-02	L20491	113-01	L20491	13-02	L2049	0113-03	L2049	113-04
		SAMPI	E DEPTH	INTERVA	L (FEET)	6-	7	13	-14	16	-17	22	2-23	44	-45	0-	1	4-	5	7	7-8	13-	14
				SAMP	LÈ TYPÉ	SO	IL	SC)IL	SC	OIL	SC	OIL	SO)IL	SO	IL	SO	IL	SC	OIL	so	IL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,3-Trichloropropane		mg/kg			mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
2-Hexanone					mg/kg	ND	0.01	ND	0.0096	ND	0.01	ND	0.012	ND	0.0096	ND	0.013	ND	0.013	ND	0.0097	ND	0.011
Bromochloromethane					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
2,2-Dichloropropane					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,2-Dibromoethane					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
1,3-Dichloropropane					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.0005	ND	0.00048	ND	0.00052	ND	0.00062	ND	0.00048	ND	0.00065	ND	0.00063	ND	0.00049	ND	0.00053
Bromobenzene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	0.00022J	0.0013	ND	0.00097	ND	0.0011
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
o-Chlorotoluene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
p-Chlorotoluene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.003	ND	0.0029	ND	0.0031	ND	0.0037	ND	0.0029	ND	0.0039	ND	0.0038	ND	0.0029	ND	0.0032
Hexachlorobutadiene					mg/kg	ND	0.004	ND	0.0039	ND	0.0042	ND	0.0049	ND	0.0038	ND	0.0052	ND	0.0051	ND	0.0039	ND	0.0043
Isopropylbenzene					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
p-Isopropyltoluene					mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	ND	0.0013	ND	0.00097	ND	0.0011
Naphthalene	12	100	100	500	mg/kg	ND	0.004	ND	0.0039	ND	0.0042	ND	0.0049	ND	0.0038	0.0073	0.0052	0.0067	0.0051	ND	0.0039	ND	0.0043
Acrylonitrile					mg/kg	ND	0.004	ND	0.0039	ND	0.0042	ND	0.0049	ND	0.0038	ND	0.0052	ND	0.0051	ND	0.0039	ND	0.0043
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.001	ND	0.00096	ND	0.001	ND	0.0012	ND	0.00096	ND	0.0013	0.00029J	0.0013	ND	0.00097	ND	0.0011
1,2,3-Trichlorobenzene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,2,4-Trichlorobenzene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	0.00052J	0.0026	0.0024J	0.0025	ND	0.0019	ND	0.0021
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	0.0016J	0.0026	0.005	0.0025	ND	0.0019	ND	0.0021
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.081	ND	0.077	ND	0.084	ND	0.099	ND	0.076	ND	0.1	ND	0.1	ND	0.078	ND	0.086
p-Diethylbenzene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	0.0011J	0.0026	0.0059	0.0025	ND	0.0019	ND	0.0021
p-Ethyltoluene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	0.00068J	0.0026	0.0019J	0.0025	ND	0.0019	ND	0.0021
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	0.00074J	0.0026	0.0029	0.0025	ND	0.0019	ND	0.0021
Ethyl ether					mg/kg	ND	0.002	ND	0.0019	ND	0.0021	ND	0.0025	ND	0.0019	ND	0.0026	ND	0.0025	ND	0.0019	ND	0.0021
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.005	ND	0.0048	ND	0.0052	ND	0.0062	ND	0.0048	ND	0.0065	ND	0.0063	ND	0.0049	ND	0.0053

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	OCATION	S-34 (1		S-34 (/	S-34 (/	S-35 (SU	JRFACE)		5 (4-5)		(7-8)	(11-12)	~ (18-19)	S-35 (2	
				SAMPLI	NG DATE	11/6/	2020	, ,	/2020	11/17	//2020		/2020	,	5/2020	, 0,	/2020	, -,	/2020		/2020	11/6/2	
				LAB SA	MPLE ID	L2049			113-06	L2051		L2049	0113-07		9113-08		113-09	L2049		L2049		L20491	
		SAMPI	LE DEPTH	INTERVA	` ′	18-			-24	49		,)-1		1-5		-8		-12		-19	21-	
					PLE TYPE	so		SC		SC			OIL		OIL	SC		SC		SC		so	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0056	ND	0.0062	ND	0.0035	ND	0.0058	ND	0.0061	ND	0.0062	ND	0.0055	ND	0.0057	ND	0.0055
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
Chloroform	0.37	10	49	350	mg/kg	ND	0.0017	ND	0.0018	ND	0.001	ND	0.0017	ND	0.0018	ND	0.0018	ND	0.0016	ND	0.0017	ND	0.0016
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
1,2-Dichloropropane					mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
Dibromochloromethane					mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
1,1,2-Trichloroethane					mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
Trichlorofluoromethane	2.22				mg/kg	ND	0.0045	ND	0.0049	ND	0.0028	ND	0.0047	ND	0.0049	ND	0.0049	ND	0.0044	ND	0.0046	ND	0.0044
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
Bromodichloromethane					mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
trans-1,3-Dichloropropene					mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
cis-1,3-Dichloropropene					mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
1,3-Dichloropropene, Total					mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
1,1-Dichloropropene					mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
Bromoform					mg/kg	ND	0.0045	ND	0.0049	ND	0.0028	ND	0.0047	ND	0.0049	ND	0.0049	ND	0.0044	ND	0.0046	ND	0.0044
1,1,2,2-Tetrachloroethane	0.00	0.0	4.0		mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	0.00018J	0.00055	ND	0.00057	ND	0.00055
Toluene	0.7	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0011	ND	0.0012	0.00038J	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	0.00062J	0.0011	ND	0.0011	ND	0.0011
Chloromethane					mg/kg	ND	0.0045	ND ND	0.0049	ND	0.0028	ND	0.0047	ND	0.0049	ND	0.0049	ND	0.0044	ND	0.0046	ND	0.0044
Bromomethane	0.00	0.04	0.0	4.0	mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
Chloroethane	0.00	100	400	500	mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND ND	0.0011	ND ND	0.0012	ND ND	0.00069	ND	0.0012	ND ND	0.0012	ND ND	0.0012	ND ND	0.0011	ND	0.0011	ND	0.0011 0.0016
trans-1,2-Dichloroethene Trichloroethene	0.19 0.47	100	100 21	200	mg/kg ma/ka	ND ND	0.0017 0.00056	ND ND	0.0018 0.00062	ND ND	0.001 0.00035	ND ND	0.0017 0.00058	ND ND	0.0018 0.00061	ND ND	0.0018 0.00062	ND ND	0.0016 0.00055	ND ND	0.0017 0.00057	ND ND	0.0016
	-	100	100	500	5 5	ND ND		ND ND		ND	0.00033	ND	0.00036	ND ND		ND ND	0.00062	ND	0.00033			ND ND	0.00033
1,2-Dichlorobenzene 1.3-Dichlorobenzene	1.1 2.4	17	49	300	mg/kg	ND ND	0.0022 0.0022	ND ND	0.0025 0.0025	ND	0.0014	ND	0.0023	ND ND	0.0024 0.0024	ND ND	0.0025	ND ND	0.0022	ND ND	0.0023 0.0023	ND ND	0.0022
1,4-Dichlorobenzene	1.8	9.8	13	20U 120	mg/kg mg/kg	ND ND	0.0022	ND ND	0.0025	ND ND	0.0014	ND ND	0.0023	ND ND	0.0024	ND ND	0.0025	ND ND	0.0022	ND ND	0.0023	ND ND	0.0022
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND ND	0.0022	ND ND	0.0025	ND	0.0014	ND	0.0023	ND ND	0.0024	ND ND	0.0025	ND	0.0022	ND	0.0023	ND ND	0.0022
p/m-Xylene	0.93	100	100	500	mg/kg	ND	0.0022	ND ND	0.0025	ND ND	0.0014	ND	0.0023	ND ND	0.0024	ND	0.0025	0.0021J	0.0022	ND	0.0023	ND	0.0022
o-Xylene	0.26	100	100	500	mg/kg	ND ND	0.0022	ND ND	0.0025	ND ND	0.0014	ND ND	0.0023	ND ND	0.0024	ND ND	0.0025	0.00213 0.0005J	0.0022	ND ND	0.0023	ND ND	0.0022
Xvlenes. Total	0.26	100	100	500	mg/kg	ND ND	0.0011	ND ND	0.0012	ND ND	0.00069	ND ND	0.0012	ND ND	0.0012	ND ND	0.0012	0.0005J 0.0026J	0.0011	ND ND	0.0011	ND ND	0.0011
cis-1.2-Dichloroethene	0.25	59	100	500	mg/kg	ND ND	0.0011	ND ND	0.0012	ND ND	0.00069	ND ND	0.0012	ND ND	0.0012	ND ND	0.0012	0.0026J ND	0.0011	ND ND	0.0011	ND ND	0.0011
1.2-Dichloroethene. Total	0.23	39	100	300	mg/kg	ND ND	0.0011	ND ND	0.0012	ND ND	0.00069	ND	0.0012	ND ND	0.0012	ND ND	0.0012	ND ND	0.0011	ND	0.0011	ND	0.0011
Dibromomethane					ma/ka	ND ND	0.0011	ND ND	0.0012	ND ND	0.00069	ND ND	0.0012	ND ND	0.0012	ND ND	0.0012	ND	0.0011	ND ND	0.0011	ND ND	0.0011
Styrene					mg/kg	0.00023J	0.0022	ND ND	0.0025	ND ND	0.0014	ND ND	0.0023	ND ND	0.0024	ND ND	0.0025	ND ND	0.0022	ND ND	0.0023	ND ND	0.0022
Dichlorodifluoromethane					mg/kg	0.000233 ND	0.0011	ND ND	0.0012	ND ND	0.00069	ND ND	0.0012	ND ND	0.0012	ND ND	0.0012	ND ND	0.0011	ND ND	0.0011	ND ND	0.0011
Acetone	0.05	100	100	500	mg/kg	ND ND	0.011	ND ND	0.012	0.0055J	0.0069	ND ND	0.012	ND ND	0.012	ND ND	0.012	ND ND	0.011	ND ND	0.011	ND ND	0.011
Carbon disulfide	0.03	100	100	300	ma/ka	ND ND	0.011	ND ND	0.012	ND	0.0069	ND ND	0.012	ND ND	0.012	ND ND	0.012	ND ND	0.011	ND ND	0.011	ND ND	0.011
2-Butanone	0.12	100	100	500	ma/ka	ND ND	0.011	ND ND	0.012	ND ND	0.0069	ND ND	0.012	ND ND	0.012	ND ND	0.012	ND ND	0.011	ND ND	0.011	ND ND	0.011
	0.12	100	100	300	5 5	ND ND	0.011	ND ND	0.012	ND ND	0.0069	ND ND	0.012	ND ND	0.012	ND ND	0.012	ND ND	0.011	ND ND	0.011	ND ND	0.011
Vinyl acetate					mg/kg	ND ND	0.011	ND ND	0.012	ND ND	0.0069	ND ND	0.012	ND ND	0.012	ND ND	0.012	ND ND	0.011	ND ND	0.011	ND ND	0.011
4-Methyl-2-pentanone					mg/kg	ND	0.011	ND	0.012	ND	0.0069	טא	0.012	ND	0.012	טא	0.012	טא	0.011	טעו	0.011	טא	0.011

				1.0	CATION	S-34 (18 10)	S-34 (23 24)	S-34 (4	10 50)	S-35 (SU	DEACE)	C 25	5 (4-5)	S-35	(7.8)	S-35 (11 12)	\$ 35 (18-19)	S-35 (2	21 22)
				SAMPLI		11/6/	,	11/6/	/	11/17/		11/6/	- /		/2020	11/6/	(-/	11/6/	/	~ (/2020	11/6/2	
				LAB SA		L2049		, ,	113-06	L20510		L2049		, -	0113-08	L2049		L2049		L2049		L20491	
		SAMDI	LE DEPTH		<u> </u>		-19	23		49-			113-07		l-5	7.		11-			-19	21-	
		SAMIL	LE DEI III		LE TYPE	SC		SC		SO		SC			OIL.	SO	-	SO		SC		SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1.2.3-Trichloropropane	CSCO	Roco	KKSCO	CBCO	mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
2-Hexanone					mg/kg	ND	0.011	ND	0.012	ND	0.0069	ND	0.012	ND	0.012	ND	0.012	ND	0.011	ND	0.011	ND	0.011
Bromochloromethane					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
2,2-Dichloropropane					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
1,2-Dibromoethane					mg/kg	ND	0.0011	ND	0.0012	ND	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
1,3-Dichloropropane					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00056	ND	0.00062	ND	0.00035	ND	0.00058	ND	0.00061	ND	0.00062	ND	0.00055	ND	0.00057	ND	0.00055
Bromobenzene					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0011	ND	0.0012	0.062	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0011	ND	0.0012	0.045	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0022	ND	0.0025	0.0033	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
o-Chlorotoluene					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
p-Chlorotoluene					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0034	ND	0.0037	ND	0.0021	ND	0.0035	ND	0.0037	ND	0.0037	ND	0.0033	ND	0.0034	ND	0.0033
Hexachlorobutadiene					mg/kg	ND	0.0045	ND	0.0049	ND	0.0028	ND	0.0047	ND	0.0049	ND	0.0049	ND	0.0044	ND	0.0046	ND	0.0044
Isopropylbenzene					mg/kg	ND	0.0011	ND	0.0012	0.035	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	0.00013J	0.0011	ND	0.0011	ND	0.0011
p-lsopropyltoluene					mg/kg	ND	0.0011	ND	0.0012	0.00013J	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	ND	0.0011	ND	0.0011	ND	0.0011
Naphthalene	12	100	100	500	mg/kg	ND	0.0045	ND	0.0049	0.0021J	0.0028	ND	0.0047	ND	0.0049	ND	0.0049	0.0068	0.0044	ND	0.0046	0.0011J	0.0044
Acrylonitrile					mg/kg	ND	0.0045	ND	0.0049	ND	0.0028	ND	0.0047	ND	0.0049	ND	0.0049	ND	0.0044	ND	0.0046	ND	0.0044
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0011	ND	0.0012	0.16	0.00069	ND	0.0012	ND	0.0012	ND	0.0012	0.00026J	0.0011	ND	0.0011	ND	0.0011
1,2,3-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
1,2,4-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	0.00092J	0.0022	ND	0.0023	ND	0.0022
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	0.0021J	0.0022	ND	0.0023	ND	0.0022
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.09	ND	0.098	ND	0.055	ND	0.093	ND	0.098	ND	0.099	ND	0.088	ND	0.091	ND	0.088
p-Diethylbenzene					mg/kg	ND	0.0022	ND	0.0025	0.045	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	0.00067J	0.0022	ND	0.0023	ND	0.0022
p-Ethyltoluene					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	0.0013J	0.0022	ND	0.0023	ND	0.0022
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0022	ND	0.0025	0.18	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	0.00024J	0.0022	ND	0.0023	ND	0.0022
Ethyl ether					mg/kg	ND	0.0022	ND	0.0025	ND	0.0014	ND	0.0023	ND	0.0024	ND	0.0025	ND	0.0022	ND	0.0023	ND	0.0022
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0056	ND	0.0062	ND	0.0035	ND	0.0058	ND	0.0061	ND	0.0062	ND	0.0055	ND	0.0057	ND	0.0055

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Envrironmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

					OCATION		(51-52)	S-36 SU			6 (4-5)		5 (8-9)	2 ((13-14)	S-36 (/	~	(22-23)	S-36 (S-37 SU	
				SAMPLI	-		6/2020	11/6/			5/2020		5/2020		/2020	11/6/			5/2020	11/16		11/10	
					MPLE ID		0706-04	L2049	113-13		0113-14		9113-15		113-16	L2049	_		9113-18		706-03	L2049	
		SAMP	LE DEPTH		` ′		1-52	0	_		1-5		3-9	13		18			2-23	53-	-	0-	_
					LE TYPE		OIL	SC			OIL		OIL	SC		SC			OIL	SC		SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0054	ND	0.005	ND	0.0045	ND	0.0071	ND	0.0066	ND	0.0066	ND	0.0055	ND	0.0049	ND	0.0055
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Chloroform	0.37	10	49	350	mg/kg	ND	0.0016	ND	0.0015	ND	0.0014	ND	0.0021	ND	0.002	ND	0.002	ND	0.0016	ND	0.0015	ND	0.0016
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
1,2-Dichloropropane					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Dibromochloromethane					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
1,1,2-Trichloroethane					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Trichlorofluoromethane					mg/kg	ND	0.0044	ND	0.004	ND	0.0036	ND	0.0057	ND	0.0052	ND	0.0053	ND	0.0044	ND	0.0039	ND	0.0044
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Bromodichloromethane					mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
trans-1,3-Dichloropropene					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
cis-1,3-Dichloropropene					mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
1,3-Dichloropropene, Total					mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
1,1-Dichloropropene					mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Bromoform					mg/kg	ND	0.0044	ND	0.004	ND	0.0036	ND	0.0057	ND	0.0052	ND	0.0053	ND	0.0044	ND	0.0039	ND	0.0044
1,1,2,2-Tetrachloroethane					mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Toluene	0.7	100	100	500	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Chloromethane					mg/kg	ND	0.0044	ND	0.004	ND	0.0036	ND	0.0057	ND	0.0052	ND	0.0053	ND	0.0044	ND	0.0039	ND	0.0044
Bromomethane		2.21		- 10	mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Chloroethane	0.00	400	400	500	mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
trans-1,2-Dichloroethene	0.19	100	100	500	mg/kg	ND	0.0016	ND	0.0015	ND ND	0.0014	ND	0.0021	ND	0.002	ND	0.002	ND	0.0016	ND ND	0.0015	ND	0.0016
Trichloroethene	0.47	10	21	200	mg/kg	ND ND	0.00054	ND	0.0005	ND	0.00045	ND ND	0.00071	ND ND	0.00066	ND	0.00066	ND ND	0.00055	ND	0.00049	ND	0.00055
1,2-Dichlorobenzene 1.3-Dichlorobenzene	1.1 2.4	100 17	100	500	mg/kg	ND ND	0.0022	ND ND	0.002	ND	0.0018	ND ND	0.0028	ND ND	0.0026 0.0026	ND ND	0.0026 0.0026		0.0022 0.0022	ND	0.002	ND	0.0022
1,0 = 1111111111111111111111111111111111			49	20U 420	mg/kg		0.0022		0.002	ND ND	0.0018		0.0028		0.00-0			ND		ND ND	0.002	ND ND	0.0022
1,4-Dichlorobenzene	1.8 0.93	9.8 62	13 100	130°	mg/kg	ND ND	0.0022 0.0022	ND ND	0.002	ND ND	0.0018	ND ND	0.0028	ND ND	0.0026	ND	0.0026 0.0026	ND	0.0022	ND ND	0.002 0.002	ND ND	0.0022
Methyl tert butyl ether p/m-Xylene	0.93	100	100	500	mg/kg mg/kg	ND ND	0.0022	ND ND	0.002 0.002	ND ND	0.0018 0.0018	ND ND	0.0028 0.0028	ND ND	0.0026 0.0026	ND ND	0.0026	ND ND	0.0022 0.0022	ND ND	0.002	ND ND	0.0022 0.0022
o-Xylene	0.26	100	100	500	mg/kg	ND ND	0.0022	ND ND	0.002	ND ND	0.0018	ND ND	0.0028	ND ND	0.0026	ND ND	0.0026	ND ND	0.0022	ND ND	0.002	ND ND	0.0022
Xvlenes. Total	0.26	100	100	500	0.0	ND ND	0.0011	ND ND	0.001	ND ND	0.0009	ND ND	0.0014	ND ND	0.0013	ND ND	0.0013	ND ND	0.0011	ND ND	0.00098	ND ND	0.0011
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg mg/kg	ND ND	0.0011	ND ND	0.001	ND ND	0.0009	ND ND	0.0014	ND ND	0.0013	ND ND	0.0013	ND ND	0.0011	ND ND	0.00098	ND ND	0.0011
1.2-Dichloroethene. Total	0.23	35	100	300	mg/kg	ND ND	0.0011	ND ND	0.001	ND ND	0.0009	ND ND	0.0014	ND	0.0013	ND ND	0.0013	ND ND	0.0011	ND ND	0.00098	ND ND	0.0011
Dibromomethane					mg/kg	ND	0.0011	ND ND	0.001	ND ND	0.0003	ND	0.0014	ND	0.0013	ND ND	0.0013	ND ND	0.0022	ND ND	0.000	ND	0.0011
Styrene					mg/kg	ND	0.0022	ND	0.002	ND ND	0.0018	ND	0.0028	ND	0.0020	ND	0.0020	ND	0.0022	ND ND	0.002	ND ND	0.0022
Dichlorodifluoromethane					mg/kg	ND	0.0011	ND ND	0.001	ND ND	0.0009	ND	0.0014	ND ND	0.0013	ND ND	0.0013	ND	0.0011	ND ND	0.00098	ND ND	0.0011
Acetone	0.05	100	100	500	mg/kg	ND ND	0.011	ND ND	0.01	ND ND	0.009	ND ND	0.014	ND ND	0.013	ND ND	0.013	ND ND	0.011	0.0076J	0.0098	0.068	0.011
Carbon disulfide	0.00	100	100	300	mg/kg	ND ND	0.011	ND	0.01	ND ND	0.009	ND	0.014	ND	0.013	ND ND	0.013	ND ND	0.011	ND	0.0098	ND	0.011
2-Butanone	0.12	100	100	500	mg/kg	ND	0.011	ND	0.01	ND ND	0.009	ND	0.014	ND	0.013	ND ND	0.013	ND	0.011	ND ND	0.0098	0.011	0.011
Vinvl acetate	0.12	100	100	500	ma/ka	ND	0.011	ND	0.01	ND ND	0.009	ND	0.014	ND	0.013	ND ND	0.013	ND	0.011	ND ND	0.0098	ND	0.011
4-Methyl-2-pentanone					ma/ka	ND	0.011	ND	0.01	ND ND	0.009	ND	0.014	ND	0.013	ND ND	0.013	ND	0.011	ND ND	0.0098	ND	0.011
- wouly-z-politatione					mg/kg	ואט	0.011	שאו	0.01	ואט	0.008	שויו	0.014	שויו	0.010	I IND	0.010	ואט	0.011	שויו	0.0030	שויו	0.011

				LC	CATION	S-35 ((51-52)	S-36 SU	RFACE	S-36	(4-5)	S-36	6 (8-9)	S-36 (13-14)	S-36 (18-19)	S-36	(22-23)	S-36	(53-54)	S-37 SU	JRFACE
				SAMPLI	NG DATE	11/16	5/2020	11/6/	2020	11/6	/2020	11/6	5/2020	11/6/	2020	11/6/	2020	11/6	/2020	11/1	6/2020	11/10	0/2020
				LAB SA	MPLE ID	L2050	706-04	L2049	113-13	L2049	0113-14	L2049	0113-15	L2049	113-16	L2049	113-17	L2049	113-18	L2050	0706-03	L2049	0628-07
		SAMPI	E DEPTH	INTERVA	L (FEET)	51	-52	0-	-1	4	l-5	8	3-9	13	-14	18-	-19	22	-23	53	3-54	0)-1
				SAMP	LE TYPE	SC)IL	so	IL	SC	OIL	S	OIL	SC	IL	SO	IL	SO)IL	S	OIL	SO)IL
VOCs by EPA 5035	USCO	RSCO RRSCO CSCO Units			Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,3-Trichloropropane					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
2-Hexanone					mg/kg	ND	0.011	ND	0.01	ND	0.009	ND	0.014	ND	0.013	ND	0.013	ND	0.011	ND	0.0098	ND	0.011
Bromochloromethane					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
2,2-Dichloropropane					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,2-Dibromoethane					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
1,3-Dichloropropane					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00054	ND	0.0005	ND	0.00045	ND	0.00071	ND	0.00066	ND	0.00066	ND	0.00055	ND	0.00049	ND	0.00055
Bromobenzene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
o-Chlorotoluene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
p-Chlorotoluene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0033	ND	0.003	ND	0.0027	ND	0.0042	ND	0.0039	ND	0.0039	ND	0.0033	ND	0.0029	ND	0.0033
Hexachlorobutadiene					mg/kg	ND	0.0044	ND	0.004	ND	0.0036	ND	0.0057	ND	0.0052	ND	0.0053	ND	0.0044	ND	0.0039	ND	0.0044
Isopropylbenzene					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
p-Isopropyltoluene					mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
Naphthalene	12	100	100	500	mg/kg	ND	0.0044	ND	0.004	ND	0.0036	ND	0.0057	ND	0.0052	ND	0.0053	ND	0.0044	ND	0.0039	ND	0.0044
Acrylonitrile					mg/kg	ND	0.0044	ND	0.004	ND	0.0036	ND	0.0057	ND	0.0052	ND	0.0053	ND	0.0044	ND	0.0039	ND	0.0044
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0011	ND	0.001	ND	0.0009	ND	0.0014	ND	0.0013	ND	0.0013	ND	0.0011	ND	0.00098	ND	0.0011
1,2,3-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,2,4-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.087	ND	0.08	ND	0.072	ND	0.11	ND	0.1	ND	0.1	ND	0.088	ND	0.078	ND	0.088
p-Diethylbenzene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
p-Ethyltoluene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
Ethyl ether					mg/kg	ND	0.0022	ND	0.002	ND	0.0018	ND	0.0028	ND	0.0026	ND	0.0026	ND	0.0022	ND	0.002	ND	0.0022
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0054	ND	0.005	ND	0.0045	ND	0.0071	ND	0.0066	ND	0.0066	ND	0.0055	ND	0.0049	ND	0.0055

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	OCATION	S-37	(4-5)	S-37	(8-9)	S-37 (12-13)	S-37 (16-17)	S-37	(22-23)	S-37 (50-51)	S-38 SU	RFACE	S-38	8 (4-5)	S-38 ((6-7)
				SAMPLIN	NG DATE	11/10			0/2020	11/10		11/10			2/2020	11/16			0/2020		0/2020	11/10/	
				LAB SA	MPLE ID	L2049	628-08	L2049	628-09	L2049	628-10	L2049	628-11	L205	0225-02	L2050'	706-01	L2049	628-12	L2049	9628-13	L20496	28-14
		SAMP	LE DEPTH	INTERVA	L (FEET)		-5	-	-9	12-		16			2-23	50-	-51	v	-1		4-5	6-	-
				SAMP	LE TYPE	SO	OIL	SC)IL	SO	IL	SC)IL	S	OIL	SO	IL	SC	OIL	S	OIL	SO	ſL.
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0055	ND	0.0061	ND	0.0065	ND	0.0049	ND	0.0056	ND	0.0045	ND	0.0064	ND	0.0053	ND	0.005
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Chloroform	0.37	10	49	350	mg/kg	ND	0.0016	ND	0.0018	ND	0.002	ND	0.0015	ND	0.0017	ND	0.0013	ND	0.0019	ND	0.0016	ND	0.0015
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
1,2-Dichloropropane					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Dibromochloromethane					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
1,1,2-Trichloroethane					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Trichlorofluoromethane					mg/kg	ND	0.0044	ND	0.0049	ND	0.0052	ND	0.004	ND	0.0045	ND	0.0036	ND	0.0051	ND	0.0043	ND	0.004
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Bromodichloromethane					mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
trans-1,3-Dichloropropene					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
cis-1,3-Dichloropropene					mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
1,3-Dichloropropene, Total					mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
1,1-Dichloropropene					mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Bromoform					mg/kg	ND	0.0044	ND	0.0049	ND	0.0052	ND	0.004	ND	0.0045	ND	0.0036	ND	0.0051	ND	0.0043	ND	0.004
1.1.2.2-Tetrachloroethane					mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Toluene	0.7	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Chloromethane					mg/kg	ND	0.0044	ND	0.0049	ND	0.0052	ND	0.004	ND	0.0045	ND	0.0036	ND	0.0051	ND	0.0043	ND	0.004
Bromomethane					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
Vinvl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Chloroethane					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1.1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
trans-1.2-Dichloroethene	0.19	100	100	500	mg/kg	ND	0.0016	ND	0.0018	ND	0.002	ND	0.0015	ND	0.0017	ND	0.0013	ND	0.0019	ND	0.0016	ND	0.0015
Trichloroethene	0.47	10	21	200	mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
1.2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1.3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
p/m-Xylene	0.26	100	100	500	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
o-Xylene	0.26	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Xvlenes, Total	0.26	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
1.2-Dichloroethene. Total					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Dibromomethane					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
Styrene					mg/kg	0.00099J	0.0011	0.0012	0.0012	0.0013	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	0.001	0.001
Dichlorodifluoromethane					mg/kg	ND	0.011	ND	0.012	ND	0.013	ND	0.0099	ND	0.011	ND	0.0089	ND	0.013	ND	0.011	ND	0.01
Acetone	0.05	100	100	500	mg/kg	ND	0.011	0.0065J	0.012	ND	0.013	0.0079J	0.0099	ND	0.011	0.012	0.0089	ND	0.013	ND	0.011	ND	0.01
Carbon disulfide	2.00				mg/kg	ND	0.011	ND	0.012	ND	0.013	ND	0.0099	ND	0.011	ND	0.0089	ND	0.013	ND	0.011	ND	0.01
2-Butanone	0.12	100	100	500	mg/kg	ND ND	0.011	ND	0.012	ND	0.013	ND	0.0099	ND	0.011	0.0029J	0.0089	ND	0.013	ND	0.011	ND	0.01
Vinvl acetate	02				ma/ka	ND	0.011	ND	0.012	ND	0.013	ND	0.0099	ND	0.011	ND	0.0089	ND	0.013	ND	0.011	ND	0.01
4-Methyl-2-pentanone					ma/ka	ND	0.011	ND	0.012	ND	0.013	ND	0.0099	ND	0.011	ND	0.0089	ND	0.013	ND	0.011	ND	0.01
priviculy:-z-pentanone					mg/kg	טאו	0.011	טוו	0.012	טאו	0.013	טאו	0.0099	טאו	0.011	טאו	0.0009	חוח	0.013	טאו	0.011	טוו	0.01

				LC	CATION	S-37	(4-5)	S-37	(8-9)	S-37 (12-13)	S-37 (16-17)	S-37	(22-23)	S-37 (50-51)	S-38 SU	RFACE	S-38	3 (4-5)	S-38 ((6-7)
				SAMPLI	NG DATE	11/10	/2020	11/10	0/2020	11/10	/2020	11/10	0/2020	11/12	2/2020	11/16	5/2020	11/10	/2020	11/10	0/2020	11/10/	/2020
				LAB SA	MPLE ID	L2049	628-08	L2049	9628-09	L2049	628-10	L2049	628-11	L2050)225-02	L2050	706-01	L2049	628-12	L2049	0628-13	L20496	528-14
		SAMPI	E DEPTH	INTERVA	L (FEET)	4	-5	8	3-9	12	-13	16	-17	22	2-23	50	-51	0-	-1	4	l-5	6-7	7
				SAMP	LE TYPE	SC	IL	SC	OIL	SC	OIL	SC)IL	SO	OIL	SC	OIL	SO	OIL	SC	OIL	SO	ĪL
VOCs by EPA 5035	USCO	RSCO RRSCO CSCO Units			Units	Results	RL	Results	RL														
1,2,3-Trichloropropane			mg/kg			ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
2-Hexanone					mg/kg	ND	0.011	ND	0.012	ND	0.013	ND	0.0099	ND	0.011	ND	0.0089	ND	0.013	ND	0.011	ND	0.01
Bromochloromethane					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
2,2-Dichloropropane					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,2-Dibromoethane					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
1,3-Dichloropropane					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00055	ND	0.00061	ND	0.00065	ND	0.00049	ND	0.00056	ND	0.00045	ND	0.00064	ND	0.00053	ND	0.0005
Bromobenzene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
o-Chlorotoluene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
p-Chlorotoluene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0033	ND	0.0036	ND	0.0039	ND	0.003	ND	0.0034	ND	0.0027	ND	0.0038	ND	0.0032	ND	0.003
Hexachlorobutadiene					mg/kg	ND	0.0044	ND	0.0049	ND	0.0052	ND	0.004	ND	0.0045	ND	0.0036	ND	0.0051	ND	0.0043	ND	0.004
Isopropylbenzene					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
p-Isopropyltoluene					mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
Naphthalene	12	100	100	500	mg/kg	ND	0.0044	ND	0.0049	ND	0.0052	ND	0.004	ND	0.0045	ND	0.0036	ND	0.0051	ND	0.0043	ND	0.004
Acrylonitrile					mg/kg	ND	0.0044	ND	0.0049	ND	0.0052	ND	0.004	ND	0.0045	ND	0.0036	ND	0.0051	ND	0.0043	ND	0.004
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0011	ND	0.0012	ND	0.0013	ND	0.00099	ND	0.0011	ND	0.00089	ND	0.0013	ND	0.0011	ND	0.001
1,2,3-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,2,4-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.088	ND	0.097	ND	0.1	ND	0.079	ND	0.09	ND	0.072	ND	0.1	ND	0.085	ND	0.08
p-Diethylbenzene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
p-Ethyltoluene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
Ethyl ether					mg/kg	ND	0.0022	ND	0.0024	ND	0.0026	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0026	ND	0.0021	ND	0.002
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0055	ND	0.0061	ND	0.0065	ND	0.0049	ND	0.0056	ND	0.0045	ND	0.0064	ND	0.0053	ND	0.005

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	OCATION	S-38 (13-1	4)	S-38 ((16-17)	S-38 (23-24)	S-38	(51-52)	S-39 SU	JRFACE	S-39	(2-3)	S-39	0 (7-8)	S-39	(12-13)	S-39 (1	18-19)
				SAMPLI	NG DATE	11/10/202	0	11/12	2/2020	11/12	/2020	11/1	2/2020	11/4	/2020	11/4	/2020	11/4	/2020	11/4	/2020	11/5/:	2020
				LAB SA	MPLE ID	L2049628-	15	L2050	225-03	L2050	225-04	L2050	0225-05	L2048	3489-01	L2048	3489-02	L2048	3489-03	L2048	3489-04	L20488	849-01
		SAMPI	LE DEPTH	INTERVA	AL (FEET)	13-14		16	-17	23	-24	51	1-52	0	-1	2	-3	7	7-8	12	-13	18-	-19
				SAMP	PLE TYPE	SOIL		SC)IL	SC	IL	S	OIL	SC	OIL	SO	OIL	S	OIL	SC	OIL	SO	IL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg		.0058	ND	0.0071	ND	0.0059	ND	0.0049	ND	0.0069	ND	0.0054	ND	0.0056	ND	0.0056	ND	0.0063
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND 0	.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Chloroform	0.37	10	49	350	mg/kg		.0017	ND	0.0021	ND	0.0018	ND	0.0014	ND	0.0021	ND	0.0016	ND	0.0017	ND	0.0017	ND	0.0019
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
1,2-Dichloropropane					mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Dibromochloromethane					mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
1,1,2-Trichloroethane					mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Tetrachloroethene	1.3	5.5	19	150	mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Chlorobenzene	1.1	100	100	500	mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Trichlorofluoromethane					mg/kg		.0046	ND	0.0057	ND	0.0047	ND	0.0039	ND	0.0056	ND	0.0044	ND	0.0045	ND	0.0045	ND	0.0051
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Bromodichloromethane					mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
trans-1,3-Dichloropropene					mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
cis-1,3-Dichloropropene					mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
1,3-Dichloropropene, Total					mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
1,1-Dichloropropene					mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Bromoform					mg/kg		.0046	ND	0.0057	ND	0.0047	ND	0.0039	ND	0.0056	ND	0.0044	ND	0.0045	ND	0.0045	ND	0.0051
1,1,2,2-Tetrachloroethane			4.0		mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Benzene	0.06	2.9	4.8	44	mg/kg		00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Toluene	0.7	100	100	500	mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	0.0033	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Ethylbenzene	1	30	41	390	mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	0.00075J	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Chloromethane					mg/kg		.0046	ND	0.0057	ND	0.0047	ND	0.0039	ND	0.0056	ND	0.0044	ND	0.0045	ND	0.0045	ND	0.0051
Bromomethane	0.00	0.04	0.0	40	mg/kg		.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
Vinyl chloride	0.02	0.21	0.9	13	mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Chloroethane	0.00	400	400	500	mg/kg		.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,1-Dichloroethene	0.33	100	100	500	mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
trans-1,2-Dichloroethene	0.19	100	100	200	mg/kg		.0017	ND ND	0.0021	ND ND	0.0018	ND	0.0014	ND	0.0021	ND ND	0.0016	ND ND	0.0017	ND ND	0.0017	ND	0.0019
Trichloroethene	0.47 1.1	10 100	21 100	200	mg/kg		.0023	ND ND	0.00071 0.0028	ND ND	0.00059 0.0024	ND ND	0.00049 0.0019	ND ND	0.00069	ND ND	0.00054 0.0022	ND ND	0.00056 0.0022	ND ND	0.00056 0.0022	ND ND	0.00063 0.0025
1,2-Dichlorobenzene	2.4	17	49	500	mg/kg ma/ka		.0023	ND ND	0.0028	ND ND	0.0024	ND ND	0.0019	ND ND	0.0028	ND ND	0.0022	ND ND	0.0022	ND ND	0.0022	ND ND	0.0025
1,3-Dichlorobenzene 1,4-Dichlorobenzene	1.8	9.8	13	20U 120	J: J		.0023	ND ND	0.0028	ND ND	0.0024	ND ND	0.0019	ND ND	0.0028	ND ND	0.0022	ND ND	0.0022	ND ND	0.0022	ND ND	0.0025
Methyl tert butyl ether	0.93	62	100	500	mg/kg ma/ka		.0023	ND ND	0.0028	ND ND	0.0024	ND	0.0019	ND ND	0.0028	ND ND	0.0022	ND ND	0.0022	ND ND	0.0022	ND ND	0.0025
p/m-Xylene	0.93	100	100	500	mg/kg		.0023	ND ND	0.0028	ND ND	0.0024	ND ND	0.0019	0.0028	0.0028	ND ND	0.0022	ND ND	0.0022	ND ND	0.0022	ND ND	0.0025
o-Xylene	0.26	100	100	500	<u> </u>		.0023	ND ND	0.0028	ND ND	0.0024	ND ND	0.0019	0.0028 0.0012J	0.0028	ND ND	0.0022	ND ND	0.0022	ND ND	0.0022	ND ND	0.0025
Xylenes, Total	0.26	100	100	500	mg/kg mg/kg		.0012	ND ND	0.0014	ND ND	0.0012	ND	0.00097	0.00123 0.004J	0.0014	ND ND	0.0011	ND ND	0.0011	ND	0.0011	ND ND	0.0013
cis-1.2-Dichloroethene	0.25	59	100	500	mg/kg		.0012	ND ND	0.0014	ND ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND ND	0.0011	ND	0.0011	ND ND	0.0013
1.2-Dichloroethene. Total	0.23	39	100	300	ma/ka		.0012	ND ND	0.0014	ND ND	0.0012	ND	0.00097	ND ND	0.0014	ND ND	0.0011	ND ND	0.0011	ND ND	0.0011	ND ND	0.0013
Dibromomethane					mg/kg		.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND ND	0.0011	ND ND	0.0011	ND	0.0011	ND	0.0013
Styrene					mg/kg		.0023	ND ND	0.0028	ND	0.0024	ND	0.0019	ND ND	0.0028	ND	0.0022	ND ND	0.0022	ND	0.0022	ND ND	0.0023
Dichlorodifluoromethane					ma/ka		0.012	ND ND	0.0014	ND ND	0.0012	ND	0.00097	ND ND	0.0014	ND ND	0.0011	ND ND	0.0011	ND	0.0011	ND ND	0.0013
Acetone	0.05	100	100	500	mg/kg		0.012	ND ND	0.014	ND ND	0.012	ND	0.0097	ND ND	0.014	ND	0.011	ND ND	0.011	ND ND	0.011	0.0065J	0.013
Carbon disulfide	0.03	100	100	300	ma/ka		0.012	ND ND	0.014	ND	0.012	ND	0.0097	ND	0.014	ND ND	0.011	ND ND	0.011	ND ND	0.011	ND	0.013
2-Butanone	0.12	100	100	500	mg/kg		0.012	ND	0.014	ND	0.012	ND	0.0097	ND	0.014	ND	0.011	ND ND	0.011	ND	0.011	ND	0.013
Vinyl acetate	0.12	100	100	300	mg/kg		0.012	ND ND	0.014	ND ND	0.012	ND	0.0097	ND ND	0.014	ND ND	0.011	ND ND	0.011	ND	0.011	ND ND	0.013
4-Methyl-2-pentanone					ma/ka		0.012	ND ND	0.014	ND ND	0.012	ND ND	0.0097	ND ND	0.014	ND ND	0.011	ND ND	0.011	ND ND	0.011	ND ND	0.013
4-ivietriyi-z-peritanone					my/kg	ואט	J.U 1Z	טאו	0.014	אט	0.012	טא	0.0097	עוו	0.014	טאו	0.011	טאו	0.011	טויו	0.011	ND	0.013

				LC	CATION	S-38 (13-14)	S-38 (16-17)	S-38 (23-24)	S-38 (51-52)	S-39 SI	REACE	S-39	(2-3)	S-39	(7-8)	S-39 ((12-13)	S-39 (18-19)
				SAMPLIN		11/10	- /	~ (2/2020	11/12	/	11/12	/	2 41 2 4	/2020	11/4/	(- /		/2020	~ (/2020	11/5/	/
				LAB SA			628-15		225-03	L2050		L2050		L2048		L2048		,	3489-03		489-04	L2048	
		SAMPI	LE DEPTH		<u> </u>		-14	16		23-		51-			-1		-3		7-8		-13	18-	
		D121/22 2	JD D D 111		LE TYPE	SC		SC		SO		SO		SC	_	SO	_		OIL	SC		SO	
VOCs by EPA 5035	USCO	O RSCO RRSCO CSCO Units			Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,3-Trichloropropane					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
2-Hexanone					mg/kg	ND	0.012	ND	0.014	ND	0.012	ND	0.0097	ND	0.014	ND	0.011	ND	0.011	ND	0.011	ND	0.013
Bromochloromethane					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
2,2-Dichloropropane					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,2-Dibromoethane					mg/kg	ND	0.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
1,3-Dichloropropane					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00058	ND	0.00071	ND	0.00059	ND	0.00049	ND	0.00069	ND	0.00054	ND	0.00056	ND	0.00056	ND	0.00063
Bromobenzene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
o-Chlorotoluene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
p-Chlorotoluene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0035	ND	0.0043	ND	0.0035	ND	0.0029	ND	0.0042	ND	0.0033	ND	0.0034	ND	0.0034	ND	0.0038
Hexachlorobutadiene					mg/kg	ND	0.0046	ND	0.0057	ND	0.0047	ND	0.0039	ND	0.0056	ND	0.0044	ND	0.0045	ND	0.0045	ND	0.0051
Isopropylbenzene					mg/kg	ND	0.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
p-Isopropyltoluene					mg/kg	ND	0.0012	ND	0.0014	ND	0.0012	ND	0.00097	0.0017	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
Naphthalene	12	100	100	500	mg/kg	ND	0.0046	ND	0.0057	ND	0.0047	ND	0.0039	ND	0.0056	ND	0.0044	ND	0.0045	ND	0.0045	ND	0.0051
Acrylonitrile					mg/kg	ND	0.0046	ND	0.0057	ND	0.0047	ND	0.0039	ND	0.0056	ND	0.0044	ND	0.0045	ND	0.0045	ND	0.0051
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0012	ND	0.0014	ND	0.0012	ND	0.00097	ND	0.0014	ND	0.0011	ND	0.0011	ND	0.0011	ND	0.0013
1,2,3-Trichlorobenzene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,2,4-Trichlorobenzene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.093	ND	0.11	ND	0.094	ND	0.078	ND	0.11	ND	0.087	ND	0.09	ND	0.09	ND	0.1
p-Diethylbenzene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
p-Ethyltoluene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
Ethyl ether					mg/kg	ND	0.0023	ND	0.0028	ND	0.0024	ND	0.0019	ND	0.0028	ND	0.0022	ND	0.0022	ND	0.0022	ND	0.0025
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0058	ND	0.0071	ND	0.0059	ND	0.0049	ND	0.0069	ND	0.0054	ND	0.0056	ND	0.0056	ND	0.0063

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO
Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Highlight Detected Above the NVSDEC USCO PSCO PRSCO and CSC

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	OCATION		(21-22)	S-39 (/	S-40 SU	RFACE		0 (2-3)		(7-8)		(11-12)		(16-17)		(23-24)	S-40 (5	,
				SAMPLI	NG DATE		1/2020	11/18	/2020		/2020		1/2020		1/2020		1/2020		1/2020		1/2020	11/11/	
				LAB SA	MPLE ID		9859-08	L2051		L2049	859-01	L2049	9859-02		9859-03	L2049	0859-04		9859-05		859-06	L20498	
		SAMPI	LE DEPTH	INTERVA	` ′		1-22	42		0			2-3		7-8		-12		5-17		-24	51-	
F					PLE TYPE		OIL	SC		SC			OIL	~ .	OIL		OIL	~	OIL	SC		SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0062	ND	0.0049	ND	0.0058	ND	0.0055	ND	0.0049	ND	0.0056	ND	0.0065	ND	0.0053	ND	0.0051
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
Chloroform	0.37	10	49	350	mg/kg	ND	0.0019	ND	0.0015	ND	0.0018	ND	0.0016	ND	0.0015	ND	0.0017	ND	0.0019	ND	0.0016	ND	0.0015
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
1,2-Dichloropropane					mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
Dibromochloromethane					mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
1,1,2-Trichloroethane				4.50	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
Trichlorofluoromethane	0.00	2.0	0.4	0.0	mg/kg	ND	0.005	ND	0.0039	ND	0.0047	ND	0.0044	ND	0.0039	ND	0.0045	ND	0.0052	ND	0.0042	ND	0.0041
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
Bromodichloromethane					mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
trans-1,3-Dichloropropene					mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
cis-1,3-Dichloropropene					mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
1,3-Dichloropropene, Total					mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
1,1-Dichloropropene					mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
Bromoform					mg/kg	ND	0.005	ND	0.0039	ND	0.0047	ND	0.0044	ND	0.0039	ND	0.0045	ND	0.0052	ND	0.0042	ND	0.0041
1,1,2,2-Tetrachloroethane	0.00	0.0	4.0	4.4	mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND 0.000001	0.00051
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	0.00022J	0.00051
Toluene	0.7	100	100	500	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
Chloromethane					mg/kg	ND ND	0.005	ND 0.00085J	0.0039	ND	0.0047	ND	0.0044 0.0022	ND ND	0.0039	ND ND	0.0045 0.0022	ND ND	0.0052	ND ND	0.0042	ND ND	0.0041
Bromomethane	0.00	0.04	0.0	40	mg/kg	ND ND	0.0025		0.0019	ND ND	0.0023	ND ND		ND ND	0.002	ND ND		ND ND	0.0026	ND	0.0021	ND ND	0.002
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND ND	0.0012 0.0025	ND ND	0.00097 0.0019	ND ND	0.0012 0.0023	ND ND	0.0011 0.0022	ND ND	0.00098	ND ND	0.0011	ND ND	0.0013 0.0026	ND ND	0.001 0.0021	ND ND	0.001 0.002
Chloroethane 1.1-Dichloroethene	0.33	100	100	500	mg/kg	ND ND	0.0025	ND ND	0.0019	ND ND	0.0023	ND ND	0.0022	ND ND	0.002	ND ND	0.0022	ND ND	0.0026	ND ND	0.0021	ND ND	0.002
trans-1.2-Dichloroethene	0.33	100		500	mg/kg	ND ND	0.0012	ND ND	0.00097	ND ND	0.0012		0.0011	ND ND	0.00098	ND ND	0.0011	ND ND	0.0013		0.001		0.001
Trichloroethene	0.19	100	100 21	200	mg/kg ma/ka	ND ND	0.0019	ND ND	0.0015	ND ND	0.0018	ND ND	0.00055	ND ND	0.0015	ND ND	0.00017	ND ND	0.0019	ND ND	0.0016	ND ND	0.0015
1,2-Dichlorobenzene	1.1	100	100	500	5. 5	ND ND	0.00062	ND	0.00049	ND	0.00036	ND	0.00033	ND ND	0.00049	ND ND	0.00036	ND ND	0.00065	ND ND	0.00033	ND	0.00031
1.3-Dichlorobenzene	2.4	17	49	300	mg/kg	ND ND	0.0025	ND ND	0.0019	ND	0.0023	ND	0.0022	ND ND	0.002	ND ND	0.0022	ND ND	0.0026	ND	0.0021	ND	0.002
1,4-Dichlorobenzene	1.8	9.8	13	20U 130	mg/kg mg/kg	ND ND	0.0025	ND ND	0.0019	ND	0.0023	ND ND	0.0022	ND	0.002	ND ND	0.0022	ND ND	0.0026	ND ND	0.0021	ND ND	0.002
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND ND	0.0025	ND	0.0019	ND	0.0023	ND ND	0.0022	ND ND	0.002	ND ND	0.0022	ND ND	0.0026	ND	0.0021	ND ND	0.002
p/m-Xylene	0.93	100	100	500	mg/kg	ND ND	0.0025	ND ND	0.0019	ND	0.0023	ND	0.0022	ND ND	0.002	ND ND	0.0022	ND ND	0.0026	ND	0.0021	ND	0.002
o-Xylene	0.26	100	100	500	mg/kg	ND ND	0.0023	ND	0.0019	ND	0.0023	ND ND	0.0022	ND ND	0.0002	ND ND	0.0022	ND ND	0.0020	ND	0.0021	ND ND	0.002
Xvlenes. Total	0.26	100	100	500	mg/kg	ND ND	0.0012	ND	0.00097	ND	0.0012	ND ND	0.0011	ND	0.00098	ND ND	0.0011	ND ND	0.0013	ND	0.001	ND	0.001
cis-1.2-Dichloroethene	0.25	59	100	500	mg/kg	ND ND	0.0012	ND ND	0.00097	ND	0.0012	ND	0.0011	ND ND	0.00098	ND ND	0.0011	ND	0.0013	ND	0.001	ND ND	0.001
1.2-Dichloroethene. Total	0.23	39	100	300	mg/kg	ND ND	0.0012	ND	0.00097	ND	0.0012	ND ND	0.0011	ND	0.00098	ND ND	0.0011	ND ND	0.0013	ND	0.001	ND	0.001
Dibromomethane					mg/kg	ND ND	0.0012	ND ND	0.00097	ND	0.0012	ND	0.0011	ND ND	0.00096	ND ND	0.0011	ND ND	0.0013	ND	0.001	ND	0.001
Styrene					mg/kg	ND ND	0.0025	ND ND	0.0019	ND ND	0.0023	ND ND	0.0022	ND ND	0.002	ND ND	0.0022	ND ND	0.0026	ND ND	0.0021	ND ND	0.002
Dichlorodifluoromethane					mg/kg	ND ND	0.0012	ND ND	0.00097	ND ND	0.0012	ND ND	0.0011	ND ND	0.00098	ND ND	0.0011	ND ND	0.0013	ND ND	0.001	ND ND	0.001
Acetone	0.05	100	100	500	mg/kg	ND ND	0.012	ND ND	0.0097	ND ND	0.012	ND ND	0.011	ND ND	0.0098	ND ND	0.011	ND ND	0.013	ND ND	0.01	0.007J	0.01
Carbon disulfide	0.03	100	100	300	ma/ka	ND ND	0.012	ND ND	0.0097	ND ND	0.012	ND ND	0.011	ND ND	0.0098	ND ND	0.011	ND ND	0.013	ND ND	0.01	0.0073 ND	0.01
2-Butanone	0.12	100	100	500	ma/ka	ND ND	0.012	ND ND	0.0097	ND ND	0.012	ND ND	0.011	ND ND	0.0098	ND ND	0.011	ND ND	0.013	ND ND	0.01	ND ND	0.01
	0.12	100	100	300	5 5	ND ND	0.012	ND ND	0.0097	ND ND	0.012	ND ND	0.011	ND ND	0.0098	ND ND	0.011	ND ND	0.013	ND ND	0.01	ND ND	0.01
Vinyl acetate					mg/kg	ND ND	0.012	ND ND	0.0097	ND ND	0.012	ND ND	0.011	ND ND	0.0098	ND ND	0.011	ND ND	0.013	ND ND	0.01	ND ND	0.01
4-Methyl-2-pentanone					mg/kg	ND	0.012	טא	0.0097	טא	0.012	טא	0.011	טא	0.0098	ND	0.011	ND	0.013	טמ	0.01	טעו	U.U I

				1.0	CATION	S-30 (21-22)	S-39 ((42-43)	S-40 SU	DEACE	S-40	(2-3)	S_40	(7-8)	S-40 (11-12)	S-40	(16-17)	S-40 ((23-24)	S-40 (:	51-52)
				SAMPLI		11/11	/	~ (3/2020	11/11		11/11	()		1/2020	11/11	,		1/2020	2	1/2020	11/11	/
				LAB SA			859-08	L2051	. = . = .	L2049		L2049			0859-03	L2049	,		9859-05		9859-06	L2049	
		SAMPI	LE DEPTH		<u> </u>	21-			-43	0-		2.			7-8	11-			-17		3-24	51-	
		5711111	DE DEI III		LE TYPE	SC		SC		SO		SO	_		OIL	SO			OIL		OIL	SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,3-Trichloropropane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
2-Hexanone					mg/kg	ND	0.012	ND	0.0097	ND	0.012	ND	0.011	ND	0.0098	ND	0.011	ND	0.013	ND	0.01	ND	0.01
Bromochloromethane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
2,2-Dichloropropane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,2-Dibromoethane					mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
1,3-Dichloropropane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00062	ND	0.00049	ND	0.00058	ND	0.00055	ND	0.00049	ND	0.00056	ND	0.00065	ND	0.00053	ND	0.00051
Bromobenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
o-Chlorotoluene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
p-Chlorotoluene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0037	ND	0.0029	ND	0.0035	ND	0.0033	ND	0.0029	ND	0.0034	ND	0.0039	ND	0.0032	ND	0.0031
Hexachlorobutadiene					mg/kg	ND	0.005	ND	0.0039	ND	0.0047	ND	0.0044	ND	0.0039	ND	0.0045	ND	0.0052	ND	0.0042	ND	0.0041
Isopropylbenzene					mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
p-Isopropyltoluene					mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
Naphthalene	12	100	100	500	mg/kg	ND	0.005	ND	0.0039	ND	0.0047	ND	0.0044	ND	0.0039	ND	0.0045	ND	0.0052	ND	0.0042	ND	0.0041
Acrylonitrile					mg/kg	ND	0.005	ND	0.0039	ND	0.0047	ND	0.0044	ND	0.0039	ND	0.0045	ND	0.0052	ND	0.0042	ND	0.0041
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0012	ND	0.00097	ND	0.0012	ND	0.0011	ND	0.00098	ND	0.0011	ND	0.0013	ND	0.001	ND	0.001
1,2,3-Trichlorobenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,2,4-Trichlorobenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.1	ND	0.078	ND	0.094	ND	0.088	ND	0.078	ND	0.09	ND	0.1	ND	0.084	ND	0.082
p-Diethylbenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
p-Ethyltoluene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
Ethyl ether					mg/kg	ND	0.0025	ND	0.0019	ND	0.0023	ND	0.0022	ND	0.002	ND	0.0022	ND	0.0026	ND	0.0021	ND	0.002
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0062	ND	0.0049	ND	0.0058	ND	0.0055	ND	0.0049	ND	0.0056	ND	0.0065	ND	0.0053	ND	0.0051

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO
Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Highlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

					OCATION	~ ~ -	URFACE		(4-5)		(7-8)		(12-13)		(17-18)		21-22)		JRFACE	S-42	(- /	S-42	(-/
					NG DATE		5/2020		/2020		5/2020		5/2020		1/2020		/2020		5/2020		/2020	11/5/2	
					MPLE ID		8849-02		8849-03		8849-04		8849-05		9859-09		859-10		8849-06	L2048		L20488	
		SAMPI	LE DEPTH		` ′	`	0-1		l-5		7-8		2-13		7-18	21)-1		-4	7-	~
VOO: 1: EDA 5005	TIGGO	Dago	DDGGG		PLE TYPE		OIL	~ .)IL	~ .	OIL		OIL		OIL	SC		~	OIL	SC		SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL 0.0044	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL 0.0050	Results	RL 0.0053
Methylene chloride	0.05	51	100	500	mg/kg	ND ND	0.0051	ND	0.0056	ND		ND	0.0063	ND	0.0056	ND	0.0053	ND	0.0058	ND	0.0052	ND	0.0053
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
Chloroform	0.37 0.76	10 1.4	49 2.4	350	mg/kg	ND ND	0.0015 0.001	ND ND	0.0017	ND ND	0.0013	ND ND	0.0019	ND ND	0.0017 0.0011	ND ND	0.0016 0.001	ND ND	0.0017 0.0012	ND ND	0.0016 0.001	ND ND	0.0016 0.0011
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND ND		ND ND	0.0011	ND ND	0.00089 0.00089	ND ND	0.0012 0.0012	ND ND		ND ND		ND ND	0.0012	ND ND		ND ND	
1,2-Dichloropropane					mg/kg	ND ND	0.001 0.001	ND ND	0.0011 0.0011	ND ND	0.00089	ND ND	0.0012	ND ND	0.0011 0.0011	ND ND	0.001 0.001	ND ND	0.0012	ND ND	0.001 0.001	ND ND	0.0011 0.0011
Dibromochloromethane 1.1.2-Trichloroethane					mg/kg ma/ka	ND ND	0.001	ND ND	0.0011	ND ND	0.00089	ND	0.0012	ND ND	0.0011	ND ND	0.001	ND ND	0.0012	ND	0.001	ND ND	0.0011
Tetrachloroethene	1.3	5.5	19	150	5. 5	ND ND	0.0001	ND ND	0.00011	ND ND	0.00069	ND	0.0012	ND ND	0.0011	ND ND	0.0001	ND ND	0.0012	ND	0.001	ND ND	0.00011
Chlorobenzene	1.1	100	100	500	mg/kg mg/kg	ND ND	0.00051	ND	0.00056	ND ND	0.00044	ND ND	0.00063	ND ND	0.00056	ND	0.00053	ND ND	0.00058	ND ND	0.00052	ND ND	0.00053
Trichlorofluoromethane	1.1	100	100	300	mg/kg	ND ND	0.00031	ND	0.00036	ND ND	0.00044	ND ND	0.0005	ND	0.00036	ND	0.00033	ND ND	0.00038	ND	0.00032	ND	0.00033
1.2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND ND	0.004	ND ND	0.0043	ND	0.0036	ND	0.003	ND ND	0.0045	ND	0.0042	ND ND	0.0046	ND	0.0042	ND	0.0043
1,1,1-Trichloroethane	0.68	100	100	500	ma/ka	ND ND	0.0001	ND	0.00011	ND ND	0.00089	ND ND	0.0012	ND	0.0011	ND	0.0001	ND ND	0.00058	ND	0.001	ND	0.00011
Bromodichloromethane	0.08	100	100	300	mg/kg	ND ND	0.00051	ND	0.00056	ND	0.00044	ND	0.00063	ND	0.00056	ND ND	0.00053	ND ND	0.00058	ND	0.00052	ND ND	0.00053
trans-1,3-Dichloropropene					mg/kg	ND ND	0.00031	ND ND	0.00036	ND	0.00044	ND	0.00003	ND ND	0.00036	ND	0.00033	ND ND	0.00036	ND ND	0.00032	ND ND	0.00033
cis-1,3-Dichloropropene					mg/kg	ND ND	0.0001	ND	0.00011	ND ND	0.00089	ND	0.0012	ND	0.00011	ND	0.0001	ND ND	0.0012	ND	0.001	ND	0.00011
1,3-Dichloropropene, Total					mg/kg	ND ND	0.00051	ND	0.00056	ND	0.00044	ND	0.00063	ND	0.00056	ND	0.00053	ND ND	0.00058	ND	0.00052	ND	0.00053
1,1-Dichloropropene					mg/kg	ND ND	0.00051	ND	0.00056	ND	0.00044	ND	0.00063	ND	0.00056	ND ND	0.00053	ND ND	0.00058	ND	0.00052	ND ND	0.00053
Bromoform					mg/kg	ND ND	0.00031	ND	0.00036	ND ND	0.00044	ND	0.0005	ND	0.00036	ND	0.00033	ND ND	0.00038	ND	0.00032	ND ND	0.00033
1,1,2,2-Tetrachloroethane					mg/kg	ND ND	0.0004	ND	0.00045	ND	0.0030	ND	0.0003	ND	0.0045	ND	0.00042	ND ND	0.00058	ND	0.00052	ND ND	0.00043
Benzene	0.06	2.9	4.8	44	mg/kg	ND ND	0.00051	ND	0.00056	ND	0.00044	ND	0.00063	ND	0.00056	ND	0.00053	ND	0.00058	ND	0.00052	ND	0.00053
Toluene	0.7	100	100	500	mg/kg	ND	0.001	ND	0.00030	ND	0.00089	ND	0.0003	ND	0.00030	ND	0.00033	ND	0.00030	ND	0.00032	ND	0.0011
Ethylbenzene	1	30	41	390	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
Chloromethane	<u> </u>	- 00	7.	000	ma/ka	ND	0.004	ND	0.0045	ND	0.0036	ND	0.005	ND	0.0045	ND	0.0042	ND	0.0046	ND	0.0042	ND	0.0043
Bromomethane					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0042	ND	0.0023	ND	0.0021	ND	0.0021
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0022	ND	0.001	ND	0.0012	ND	0.001	ND	0.0021
Chloroethane	0.02	0.21	0.0	10	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1.1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
trans-1.2-Dichloroethene	0.19	100	100	500	ma/ka	ND	0.0015	ND	0.0017	ND	0.0013	ND	0.0019	ND	0.0017	ND	0.0016	ND	0.0017	ND	0.0016	ND	0.0016
Trichloroethene	0.47	10	21	200	ma/ka	ND	0.00051	ND	0.00056	ND	0.00044	ND	0.00063	ND	0.00056	ND	0.00053	ND	0.00058	ND	0.00052	ND	0.00053
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1.3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
p/m-Xylene	0.26	100	100	500	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
o-Xylene	0.26	100	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
Xylenes, Total	0.26	100	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
1,2-Dichloroethene, Total					mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
Dibromomethane					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
Styrene					mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
Dichlorodifluoromethane					mg/kg	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	ND	0.011
Acetone	0.05	100	100	500	mg/kg	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	0.0085J	0.011
Carbon disulfide					mg/kg	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	ND	0.011
2-Butanone	0.12	100	100	500	mg/kg	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	ND	0.011
Vinyl acetate					mg/kg	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	ND	0.011
4-Methyl-2-pentanone					ma/ka	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	ND	0.011
7. = F - · · · · · · · ·					33																		

				1.0	CATION	S-41 SUR	PEACE	S /11	(4-5)	S-41	(7.8)	S-41 (12 13)	\$ 41	(17-18)	S-41 (21 22)	S 42 SI	JRFACE	\$ 42	(3-4)	S-42	(7.8)
				SAMPLI		3-41 SUR 11/5/2			/2020	11/5/	(• •)	11/5/	/		1/2020	11/11	,	2 2	/2020		/2020	11/5/	(-/
				LAB SA		L20488		,	849-03	L2048		L2048			0859-09	L2049	,		8849-06		8849-07		849-08
		SAMPI	LE DEPTH		<u> </u>	0-1			-5	7-		12.			7-18	21.		12040			6-4	7-	
		SAMI I	LE DEI III		LE TYPE	SOI		SC		SO		SO	_		OIL.	SO			OIL	SO	-	SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,3-Trichloropropane	CSCO	RSCO	RIESCO	CDCO	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
2-Hexanone					ma/ka	ND	0.01	ND	0.011	ND	0.0089	ND	0.012	ND	0.011	ND	0.01	ND	0.012	ND	0.01	ND	0.011
Bromochloromethane					ma/ka	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
2,2-Dichloropropane					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,2-Dibromoethane					mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
1,3-Dichloropropane					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00051	ND	0.00056	ND	0.00044	ND	0.00063	ND	0.00056	ND	0.00053	ND	0.00058	ND	0.00052	ND	0.00053
Bromobenzene					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
o-Chlorotoluene					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
p-Chlorotoluene					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.003	ND	0.0034	ND	0.0027	ND	0.0038	ND	0.0034	ND	0.0032	ND	0.0035	ND	0.0031	ND	0.0032
Hexachlorobutadiene					mg/kg	ND	0.004	ND	0.0045	ND	0.0036	ND	0.005	ND	0.0045	ND	0.0042	ND	0.0046	ND	0.0042	ND	0.0043
Isopropylbenzene					mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
p-Isopropyltoluene					mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
Naphthalene	12	100	100	500	mg/kg	ND	0.004	ND	0.0045	ND	0.0036	ND	0.005	ND	0.0045	ND	0.0042	ND	0.0046	ND	0.0042	ND	0.0043
Acrylonitrile					mg/kg	ND	0.004	ND	0.0045	ND	0.0036	ND	0.005	ND	0.0045	ND	0.0042	ND	0.0046	ND	0.0042	ND	0.0043
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.001	ND	0.0011	ND	0.00089	ND	0.0012	ND	0.0011	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011
1,2,3-Trichlorobenzene					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,2,4-Trichlorobenzene					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	0.00028J	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.081	ND	0.09	ND	0.071	ND	0.1	ND	0.09	ND	0.085	ND	0.092	ND	0.084	ND	0.086
p-Diethylbenzene					mg/kg	0.0028	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
p-Ethyltoluene					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
1,2,4,5-Tetramethylbenzene					0 0	0.00051J	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
Ethyl ether					mg/kg	ND	0.002	ND	0.0022	ND	0.0018	ND	0.0025	ND	0.0022	ND	0.0021	ND	0.0023	ND	0.0021	ND	0.0021
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0051	ND	0.0056	ND	0.0044	ND	0.0063	ND	0.0056	ND	0.0053	ND	0.0058	ND	0.0052	ND	0.0053

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

					OCATION		(13-14)		(17-18)		(21-22)	S-42 (,	2 2	URFACE	S-43	()	2	3 (8-9)	S-43 (,	(16-17)
				SAMPLI	-		5/2020		5/2020		5/2020	11/5/			9/2020	11/9/			/2020	11/9/		11/9/	
					MPLE ID		8849-09		8849-10		3849-11		849-12		9352-07	L2049			9352-09	L2049		L2049	
		SAMPI	LE DEPTH	INTERVA			3-14		7-18		-22	53-		`	0-1	3	-		3-9	13-			-17
					LE TYPE		OIL		OIL		OIL	SO			OIL	SC		~ .	OIL	SO		SC	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0062	ND	0.0046	ND	0.0048	ND	0.0053	ND	0.0058	ND	0.0055	ND	0.0061	ND	0.0048	ND	0.0059
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Chloroform	0.37	10	49	350	mg/kg	ND	0.0018	ND	0.0014	ND	0.0014	ND	0.0016	ND	0.0018	ND	0.0017	ND	0.0018	ND	0.0014	ND	0.0018
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
1,2-Dichloropropane					mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Dibromochloromethane					mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
1,1,2-Trichloroethane	4.0		40	450	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00062	ND	0.00046	ND ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Trichlorofluoromethane	0.00	0.0	0.4	00	mg/kg	ND	0.0049	ND	0.0037	ND	0.0038	ND	0.0042	ND	0.0047	ND	0.0044	ND	0.0049	ND	0.0038	ND	0.0047
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Bromodichloromethane					mg/kg	ND	0.00062	ND	0.00046	ND ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND ND	0.00048	ND	0.00059
trans-1,3-Dichloropropene					mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
cis-1,3-Dichloropropene					mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
1,3-Dichloropropene, Total					mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
1,1-Dichloropropene					mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Bromoform					mg/kg	ND	0.0049	ND	0.0037	ND	0.0038	ND	0.0042	ND	0.0047	ND	0.0044	ND	0.0049	ND	0.0038	ND	0.0047
1,1,2,2-Tetrachloroethane	0.00	0.0	4.0		mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Toluene	0.7	100	100	500	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Chloromethane					mg/kg	ND	0.0049	ND	0.0037	ND ND	0.0038	ND	0.0042	ND	0.0047	ND	0.0044	ND	0.0049	ND	0.0038	ND	0.0047
Bromomethane	0.00	0.04	0.0	40	mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Chloroethane	0.00	100	400	500	mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND ND	0.0012	ND ND	0.00093	ND ND	0.00096 0.0014	ND	0.001 0.0016	ND ND	0.0012	ND ND	0.0011	ND ND	0.0012	ND	0.00096	ND ND	0.0012 0.0018
trans-1,2-Dichloroethene Trichloroethene	0.19 0.47		100 21	200	mg/kg	ND ND	0.0018 0.00062	ND ND	0.0014 0.00046	ND ND	0.0014	ND ND	0.00053	ND ND	0.0018 0.00058	ND ND	0.0017	ND ND	0.0018 0.00061	ND ND	0.0014 0.00048	ND ND	0.0018
	-	10		200	mg/kg											ND ND							
1,2-Dichlorobenzene 1.3-Dichlorobenzene	1.1 2.4	100 17	100	500	mg/kg	ND ND	0.0025	ND ND	0.0019	ND ND	0.0019	ND	0.0021	ND ND	0.0023	ND ND	0.0022	ND ND	0.0024 0.0024	ND ND	0.0019	ND ND	0.0024
7-	1.8	9.8	49	∠0U 120	mg/kg	ND ND	0.0025	ND ND	0.0019	ND ND	0.0019	ND ND	0.0021 0.0021	ND ND	0.0023	ND ND		ND ND		ND ND	0.0019	ND ND	0.0024
1,4-Dichlorobenzene	0.93	9.6 62	13	F00	mg/kg	ND ND	0.0025	ND ND	0.0019		0.0019	ND		ND ND	0.0023	ND ND	0.0022		0.0024		0.0019		0.0024
Methyl tert butyl ether	0.93	100	100 100	500 500	mg/kg	ND ND	0.0025 0.0025	ND ND	0.0019 0.0019	ND ND	0.0019 0.0019	ND ND	0.0021 0.0021	ND ND	0.0023 0.0023	ND ND	0.0022	ND ND	0.0024 0.0024	ND ND	0.0019 0.0019	ND ND	0.0024 0.0024
p/m-Xylene		100			mg/kg											ND ND							
o-Xylene Xvlenes. Total	0.26	100	100 100	500 500	mg/kg	ND ND	0.0012 0.0012	ND ND	0.00093 0.00093	ND ND	0.00096 0.00096	ND ND	0.001 0.001	ND ND	0.0012 0.0012	ND ND	0.0011	ND ND	0.0012 0.0012	ND ND	0.00096 0.00096	ND ND	0.0012 0.0012
cis-1.2-Dichloroethene	0.25	59	100	500	mg/kg	ND ND	0.0012	ND ND	0.00093	ND ND	0.00096	ND ND	0.001	ND ND	0.0012	ND ND	0.0011	ND ND	0.0012	ND ND	0.00096	ND ND	0.0012
	0.25	59	100	500	mg/kg	ND ND	0.0012	ND ND	0.00093	ND ND	0.00096			ND ND	0.0012	ND ND	0.0011	ND ND	0.0012		0.00096	ND ND	
1,2-Dichloroethene, Total					mg/kg			ND ND			0.00096	ND	0.001 0.0021			ND ND			0.0012	ND			0.0012
Dibromomethane					mg/kg	ND ND	0.0025 0.0012		0.0019 0.00093	ND ND	0.0019	ND 0.00021J	0.0021	ND ND	0.0023 0.0012	0.00025J	0.0022 0.0011	ND 0.00024J	0.0024	ND 0.00010.1	0.0019 0.00096	ND	0.0024 0.0012
Styrene					mg/kg			ND												0.00019J		ND	
Dichlorodifluoromethane	0.05	100	100	E00	mg/kg	ND ND	0.012	ND ND	0.0093	ND ND	0.0096	ND 0.000 I	0.01	ND ND	0.012	ND ND	0.011	ND ND	0.012	ND 0.00501	0.0096	ND ND	0.012
Acetone	0.05	100	100	500	mg/kg	ND ND	0.012		0.0093	ND ND	0.0096	0.009J	0.01		0.012		0.011	ND	0.012	0.0052J	0.0096	ND	0.012
Carbon disulfide	0.10	100	100	E00	mg/kg	ND	0.012	ND	0.0093	ND	0.0096	ND	0.01	ND	0.012	ND	0.011	ND	0.012	ND	0.0096	ND	0.012
2-Butanone	0.12	100	100	500	mg/kg	ND ND	0.012	ND	0.0093	ND	0.0096	ND	0.01	ND	0.012	ND	0.011	ND	0.012	ND	0.0096	ND ND	0.012
Vinyl acetate					mg/kg	ND	0.012	ND	0.0093	ND	0.0096	ND	0.01	ND	0.012	ND	0.011	ND	0.012	ND	0.0096	ND	0.012
4-Methyl-2-pentanone					mg/kg	ND	0.012	ND	0.0093	ND	0.0096	ND	0.01	ND	0.012	ND	0.011	ND	0.012	ND	0.0096	ND	0.012

				LC	CATION	S-42 (13-14)	S-42	(17-18)	S-42 (21-22)	S-42 (5	53-54)	S-43 SU	RFACE	S-43	(3-4)	S-43	(8-9)	S-43	(13-14)	S-43 (16-17)
				SAMPLI	NG DATE	11/5/	2020	11/5	/2020	11/5	2020	11/5/2	2020	11/9	/2020	11/9/	2020	11/9	/2020	11/9	0/2020	11/9/	/2020
				LAB SA	MPLE ID	L2048	849-09	L2048	8849-10	L2048	849-11	L20488	349-12	L2049	352-07	L2049	352-08	L2049	352-09	L2049	9352-10	L2049	352-11
		SAMPI	LE DEPTH	INTERVA	L (FEET)	13-	-14	17	'-18	21	-22	53-	54	0	-1	3-	-4	8	-9	13	3-14	16-	-17
				SAMP	LE TYPE	SC	IL	SO	OIL	SC	OIL	so	IL	SC	DIL	SO	IL	SC	DIL	SO	OIL	SC)IL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,2,3-Trichloropropane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
2-Hexanone					mg/kg	ND	0.012	ND	0.0093	ND	0.0096	ND	0.01	ND	0.012	ND	0.011	ND	0.012	ND	0.0096	ND	0.012
Bromochloromethane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
2,2-Dichloropropane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,2-Dibromoethane					mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
1,3-Dichloropropane					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00062	ND	0.00046	ND	0.00048	ND	0.00053	ND	0.00058	ND	0.00055	ND	0.00061	ND	0.00048	ND	0.00059
Bromobenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
o-Chlorotoluene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
p-Chlorotoluene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0037	ND	0.0028	ND	0.0029	ND	0.0032	ND	0.0035	ND	0.0033	ND	0.0037	ND	0.0029	ND	0.0035
Hexachlorobutadiene					mg/kg	ND	0.0049	ND	0.0037	ND	0.0038	ND	0.0042	ND	0.0047	ND	0.0044	ND	0.0049	ND	0.0038	ND	0.0047
Isopropylbenzene					mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
p-Isopropyltoluene					mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
Naphthalene	12	100	100	500	mg/kg	ND	0.0049	ND	0.0037	ND	0.0038	ND	0.0042	ND	0.0047	ND	0.0044	ND	0.0049	ND	0.0038	ND	0.0047
Acrylonitrile					mg/kg	ND	0.0049	ND	0.0037	ND	0.0038	ND	0.0042	ND	0.0047	ND	0.0044	ND	0.0049	ND	0.0038	ND	0.0047
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0012	ND	0.00093	ND	0.00096	ND	0.001	ND	0.0012	ND	0.0011	ND	0.0012	ND	0.00096	ND	0.0012
1,2,3-Trichlorobenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,2,4-Trichlorobenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.099	ND	0.074	ND	0.077	ND	0.084	ND	0.093	ND	0.089	ND	0.098	ND	0.077	ND	0.094
p-Diethylbenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	0.00019J	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
p-Ethyltoluene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
Ethyl ether					mg/kg	ND	0.0025	ND	0.0019	ND	0.0019	ND	0.0021	ND	0.0023	ND	0.0022	ND	0.0024	ND	0.0019	ND	0.0024
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0062	ND	0.0046	ND	0.0048	ND	0.0053	ND	0.0058	ND	0.0055	ND	0.0061	ND	0.0048	ND	0.0059

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Envrironmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1A Volatile Organics in Soil 1440-1460 39th Street Brooklyn

					OCATION	2	(22-23)		RFACE	S-44	(- /		(7-8)		(13-14)	S-44 (/		(22-23)		(51-52)	S-45 SU	
				SAMPLI	-		/2020		/2020		/2020	,,	/2020		/2020	11/9/			/2020		5/2020	11/10	
				LAB SA	MPLE ID		9352-12	L2049	352-01	L2049		L2049	352-03		0352-04		352-05		9352-06		706-02		628-16
		SAMPI	LE DEPTH				2-23		-1		-5		-8		3-14	17			2-23		-52	0-	
					PLE TYPE		OIL)IL	SC)IL	~ ~ ~	OIL	SC			OIL)IL	SO	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0053	ND	0.0059	ND	0.0051	ND	0.0056	ND	0.0053	ND	0.0061	ND	0.0054	ND ND	0.0046	ND	0.0047
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Chloroform	0.37	10	49	350	mg/kg	ND	0.0016	ND	0.0018	ND	0.0015	ND	0.0017	ND	0.0016	ND	0.0018	ND	0.0016	ND	0.0014	ND	0.0014
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
1,2-Dichloropropane					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Dibromochloromethane					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
1,1,2-Trichloroethane	1.0		40	450	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Trichlorofluoromethane	0.00	0.0	0.4	0.0	mg/kg	ND	0.0042	ND	0.0048	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0049	ND	0.0043	ND	0.0037	ND	0.0038
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Bromodichloromethane					mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
trans-1,3-Dichloropropene					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
cis-1,3-Dichloropropene					mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
1,3-Dichloropropene, Total					mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
1,1-Dichloropropene					mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Bromoform					mg/kg	ND	0.0042	ND	0.0048	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0049	ND	0.0043	ND	0.0037	ND	0.0038
1,1,2,2-Tetrachloroethane	0.00				mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Toluene	0.7	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Ethylbenzene	1	30	41	390	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Chloromethane					mg/kg	ND	0.0042	ND	0.0048	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0049	ND	0.0043	ND	0.0037	ND	0.0038
Bromomethane	0.00	2.21			mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Chloroethane	0.00	400	400	500	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
trans-1,2-Dichloroethene	0.19	100	100	500	mg/kg	ND	0.0016	ND	0.0018	ND	0.0015	ND	0.0017	ND	0.0016	ND	0.0018	ND	0.0016	ND	0.0014	ND	0.0014
Trichloroethene	0.47	10	21	200	mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
p/m-Xylene	0.26	100	100	500	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
o-Xylene	0.26	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Xylenes, Total	0.26	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
1,2-Dichloroethene, Total					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Dibromomethane					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
Styrene					mg/kg	0.00031J	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Dichlorodifluoromethane	0.07	400	4		mg/kg	ND	0.01	ND 2.004	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	ND	0.0095
Acetone	0.05	100	100	500	mg/kg	ND	0.01	0.034	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	0.0095	0.0095
Carbon disulfide	2.10				mg/kg	ND	0.01	ND	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	ND	0.0095
2-Butanone	0.12	100	100	500	mg/kg	ND	0.01	ND	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	ND	0.0095
Vinyl acetate					mg/kg	ND	0.01	ND	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	ND	0.0095
4-Methyl-2-pentanone					mg/kg	ND	0.01	ND	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	ND	0.0095

				1.0	CATION	S-43 (22-23)	S-44 SU	REACE	S-44	(4-5)	S-44	(7-8)	S-44	(13-14)	S-44 (17-18)	S-44 ((22-23)	S-44 ((51-52)	S-45 SI	RFACE
				SAMPLI		11/9	- /	11/9/		11/9	(- /	11/9/	(- =)		/2020	11/9/	- /		/2020		5/2020	11/10	
				LAB SA			352-12	L2049		L2049		L2049			0352-04	L2049			352-06		0706-02		628-16
		SAMPI	LE DEPTH		<u> </u>	22		0.			-5	7.			3-14	17-			-23		-52		-1
		5711111	LL DLI III		LE TYPE	SC	_	SO		SC		SO	~		OIL.	SO			OIL	SC		SC	
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL																
1,2,3-Trichloropropane	6566	1.000	111500	0500	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
2-Hexanone					ma/ka	ND	0.01	ND	0.012	ND	0.01	ND	0.011	ND	0.01	ND	0.012	ND	0.011	ND	0.0092	ND	0.0095
Bromochloromethane					ma/ka	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
2,2-Dichloropropane					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,2-Dibromoethane					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
1,3-Dichloropropane					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00053	ND	0.00059	ND	0.00051	ND	0.00056	ND	0.00053	ND	0.00061	ND	0.00054	ND	0.00046	ND	0.00047
Bromobenzene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
o-Chlorotoluene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
p-Chlorotoluene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0032	ND	0.0036	ND	0.0031	ND	0.0034	ND	0.0032	ND	0.0037	ND	0.0032	ND	0.0028	ND	0.0028
Hexachlorobutadiene					mg/kg	ND	0.0042	ND	0.0048	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0049	ND	0.0043	ND	0.0037	ND	0.0038
Isopropylbenzene					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
p-Isopropyltoluene					mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
Naphthalene	12	100	100	500	mg/kg	ND	0.0042	0.0016J	0.0048	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0049	ND	0.0043	ND	0.0037	ND	0.0038
Acrylonitrile					mg/kg	ND	0.0042	ND	0.0048	ND	0.0041	ND	0.0045	ND	0.0042	ND	0.0049	ND	0.0043	ND	0.0037	ND	0.0038
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.001	ND	0.0012	ND	0.001	ND	0.0011	ND	0.001	ND	0.0012	ND	0.0011	ND	0.00092	ND	0.00095
1,2,3-Trichlorobenzene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,2,4-Trichlorobenzene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.084	ND	0.095	ND	0.082	ND	0.09	ND	0.084	ND	0.098	ND	0.086	ND	0.074	ND	0.076
p-Diethylbenzene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
p-Ethyltoluene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
Ethyl ether					mg/kg	ND	0.0021	ND	0.0024	ND	0.002	ND	0.0023	ND	0.0021	ND	0.0024	ND	0.0022	ND	0.0018	ND	0.0019
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0053	ND	0.0059	ND	0.0051	ND	0.0056	ND	0.0053	ND	0.0061	ND	0.0054	ND	0.0046	ND	0.0047

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO
Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

lighlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

				LO	CATION	S-45	5 (3-4)	S-45	(8-9)	S-45 (12-13)	S-45 (1	16-17)	S-45 ((23-24)	S-45	(52-53)
				SAMPLIN	IG DATE	11/10	0/2020	11/10	0/2020	11/10	/2020	11/10/	/2020	11/10	0/2020	11/1	2/2020
				LAB SA	MPLE ID	L2049	0628-17	L2049	628-18	L2049	628-19	L20496	528-20	L2049	628-21	L205	0225-06
		SAMP	LE DEPTH	INTERVA	L (FEET)	3	3-4	8	-9	12-	-13	16-	17	23	-24	52	2-53
				SAMP	LE TYPE	SC	OIL	SC	DIL	SO	IL	so	IL	SC)IL	S	OIL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL										
Methylene chloride	0.05	51	100	500	mg/kg	ND	0.0054	ND	0.0057	ND	0.0067	ND	0.0051	ND	0.0058	ND	0.005
1,1-Dichloroethane	0.27	19	26	240	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Chloroform	0.37	10	49	350	mg/kg	ND	0.0016	ND	0.0017	ND	0.002	ND	0.0015	ND	0.0017	ND	0.0015
Carbon tetrachloride	0.76	1.4	2.4	22	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
1,2-Dichloropropane					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Dibromochloromethane					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
1,1,2-Trichloroethane					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Tetrachloroethene	1.3	5.5	19	150	mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Chlorobenzene	1.1	100	100	500	mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Trichlorofluoromethane					mg/kg	ND	0.0043	ND	0.0045	ND	0.0054	ND	0.0041	ND	0.0047	ND	0.004
1,2-Dichloroethane	0.02	2.3	3.1	30	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
1,1,1-Trichloroethane	0.68	100	100	500	mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Bromodichloromethane					mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
trans-1,3-Dichloropropene					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
cis-1,3-Dichloropropene					mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
1,3-Dichloropropene, Total					mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
1,1-Dichloropropene					mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Bromoform					mg/kg	ND	0.0043	ND	0.0045	ND	0.0054	ND	0.0041	ND	0.0047	ND	0.004
1,1,2,2-Tetrachloroethane					mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Benzene	0.06	2.9	4.8	44	mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Toluene	0.7	100	100	500 390	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Ethylbenzene	1	30	41	390	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Chloromethane					mg/kg	ND	0.0043	ND	0.0045	ND	0.0054	ND	0.0041	ND	0.0047	ND	0.004
Bromomethane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
Vinyl chloride	0.02	0.21	0.9	13	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Chloroethane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,1-Dichloroethene	0.33	100	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
trans-1,2-Dichloroethene	0.19	100	100	500	mg/kg	ND	0.0016	ND	0.0017	ND	0.002	ND	0.0015	ND	0.0017	ND	0.0015
Trichloroethene	0.47	10	21	200	mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
Methyl tert butyl ether	0.93	62	100	500	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
p/m-Xylene	0.26	100	100	500	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
o-Xylene	0.26	100	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Xylenes, Total	0.26	100	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
cis-1,2-Dichloroethene	0.25	59	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
1,2-Dichloroethene, Total					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Dibromomethane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
Styrene					mg/kg	0.0011	0.0011	ND	0.0011	0.0013	0.0013	ND	0.001	0.0011J	0.0012	ND	0.00099
Dichlorodifluoromethane					mg/kg	ND	0.011	ND	0.011	ND	0.013	ND	0.01	ND	0.012	ND	0.0099
Acetone	0.05	100	100	500	mg/kg	0.029	0.011	ND	0.011	ND	0.013	0.0073J	0.01	ND	0.012	ND	0.0099
Carbon disulfide					mg/kg	ND	0.011	ND	0.011	ND	0.013	ND	0.01	ND	0.012	ND	0.0099
2-Butanone	0.12	100	100	500	mg/kg	ND	0.011	ND	0.011	ND	0.013	ND	0.01	ND	0.012	ND	0.0099
Vinyl acetate					mg/kg	ND	0.011	ND	0.011	ND	0.013	ND	0.01	ND	0.012	ND	0.0099
4-Methyl-2-pentanone					mg/kg	ND	0.011	ND	0.011	ND	0.013	ND	0.01	ND	0.012	ND	0.0099

				LO	CATION	S-45	(3-4)	S-45	(8-9)	S-45 (12-13)	S-45 (16-17)	S-45 (23-24)	S-45	(52-53)
				SAMPLIN	IG DATE	11/10	/2020	11/10	/2020	11/10	/2020	11/10	/2020	11/10	/2020	11/1	2/2020
				LAB SAI	MPLE ID	L2049	628-17	L2049	628-18	L2049	628-19	L2049	628-20	L2049	628-21	L205	0225-06
		SAMP	LE DEPTH	INTERVA	L (FEET)	3		8-		12-		16-			-24	52	2-53
				SAMP	LE TYPE	SC)IL	SO	IL	SO	IL	so	IL	SC	OIL	S	OIL
VOCs by EPA 5035	USCO	RSCO	RRSCO	CSCO	Units	Results	RL										
1,2,3-Trichloropropane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
2-Hexanone					mg/kg	ND	0.011	ND	0.011	ND	0.013	ND	0.01	ND	0.012	ND	0.0099
Bromochloromethane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
2,2-Dichloropropane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,2-Dibromoethane					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
1,3-Dichloropropane					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,1,1,2-Tetrachloroethane					mg/kg	ND	0.00054	ND	0.00057	ND	0.00067	ND	0.00051	ND	0.00058	ND	0.0005
Bromobenzene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
n-Butylbenzene	12	100	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
sec-Butylbenzene	11	100	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
tert-Butylbenzene	5.9	100	100	500	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
o-Chlorotoluene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
p-Chlorotoluene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,2-Dibromo-3-chloropropane					mg/kg	ND	0.0032	ND	0.0034	ND	0.004	ND	0.0031	ND	0.0035	ND	0.003
Hexachlorobutadiene					mg/kg	ND	0.0043	ND	0.0045	ND	0.0054	ND	0.0041	ND	0.0047	ND	0.004
Isopropylbenzene					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
p-Isopropyltoluene					mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
Naphthalene	12	100	100	500	mg/kg	ND	0.0043	ND	0.0045	ND	0.0054	ND	0.0041	ND	0.0047	ND	0.004
Acrylonitrile					mg/kg	ND	0.0043	ND	0.0045	ND	0.0054	ND	0.0041	ND	0.0047	ND	0.004
n-Propylbenzene	3.9	100	100	500	mg/kg	ND	0.0011	ND	0.0011	ND	0.0013	ND	0.001	ND	0.0012	ND	0.00099
1,2,3-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,2,4-Trichlorobenzene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,3,5-Trimethylbenzene	8.4	47	52	190	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,2,4-Trimethylbenzene	3.6	47	52	190	mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.086	ND	0.091	ND	0.11	ND	0.082	ND	0.093	ND	0.079
p-Diethylbenzene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
p-Ethyltoluene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
1,2,4,5-Tetramethylbenzene					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
Ethyl ether					mg/kg	ND	0.0022	ND	0.0023	ND	0.0027	ND	0.002	ND	0.0023	ND	0.002
trans-1,4-Dichloro-2-butene					mg/kg	ND	0.0054	ND	0.0057	ND	0.0067	ND	0.0051	ND	0.0058	ND	0.005

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				L	OCATION	S-32 SUR	FACE	S-32 (3	3-4)	S-32 (6-7)	S-32 (1	13-14)	S-32 (17-18)	S-32 (22	2-23)	S-32 (4	5-46)	S-33 SUI	RFACE	S-33 (4	(4-5)
					NG DATE	11/10/2		11/10/2		11/10/2		11/10	- /	11/10/2020	_	11/10/2	,	11/17/	/	11/4/2		11/4/2	` /
					MPLE ID	L2049628	-01 R1	L204962	28-02	L20496	28-03	L20490	628-04	L2049628-0	5	L204962	28-06	L20510	11-03	L20484		L20484	189-06
		SAMPI	LE DEPTH		-	0-1		3-4		6-7		13-		17-18		22-2		45-4		0-1		4-5	
					PLÈ TYPÉ	SOI	L	SOI		SOI	L	SO	IL	SOIL		SOI	L	SOI		SOI	L	SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL		RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.14).14	ND	0.14	ND	0.14	ND	0.16	ND	0.16
1,2,4-Trichlorobenzene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12
Bis(2-chloroethyl)ether					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND C).15	ND	0.16	ND	0.16	ND	0.18	ND	0.18
2-Chloronaphthalene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
3,3'-Dichlorobenzidine					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2,4-Dinitrotoluene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2,6-Dinitrotoluene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Fluoranthene	100	100	100	500	mg/kg	0.092J	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.1	ND	0.11	0.62	0.12	ND	0.12
4-Chlorophenyl phenyl ether					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
4-Bromophenyl phenyl ether					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND C).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.24	ND	0.24	ND	0.22	ND	0.2		0.2	ND	0.21	ND	0.21	ND	0.24	ND	0.24
Bis(2-chloroethoxy)methane					mg/kg	ND	0.22	ND	0.22	ND	0.2	ND	0.18	ND C).18	ND	0.19	ND	0.19	ND	0.22	ND	0.22
Hexachlorobutadiene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	_).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Hexachlorocyclopentadiene					mg/kg	ND	0.58	ND	0.57	ND	0.53	ND	0.48).49	ND	0.49	ND	0.5	ND	0.58	ND	0.58
Hexachloroethane					mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.14).14	ND	0.14	ND	0.14	ND	0.16	ND	0.16
Isophorone					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.15).15	ND	0.16	ND	0.16	ND	0.18	ND	0.18
Naphthalene	12	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Nitrobenzene					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.15).15	ND	0.16	ND	0.16	ND	0.18	ND	0.18
NDPA/DPA					mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.14).14	ND	0.14	ND	0.14	ND	0.16	ND	0.16
n-Nitrosodi-n-propylamine					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	_).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Butyl benzyl phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	_).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Di-n-butylphthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Di-n-octylphthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Diethyl phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	_).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Dimethyl phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17).17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Benzo(a)anthracene	1	1	1	5.6	mg/kg	0.041J	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.41	0.12	ND	0.12
Benzo(a)pyrene	1	1	1	1	mg/kg	ND 0.0401	0.16	ND	0.16	ND	0.15	ND	0.14	_).14	ND	0.14	ND	0.14	0.35	0.16	ND	0.16
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	0.048J	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.44	0.12	ND	0.12
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.12	0.12	ND	0.12
Chrysene	1	1	3.9	56	mg/kg	0.044J	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.4	0.12	ND	0.12
Acenaphthylene	100	100	100	500	mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.14		0.14	ND	0.14	ND	0.14	ND 0.001	0.16	ND	0.16
Anthracene	100	100	100	500	mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.09J	0.12	ND	0.12
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.14).14	ND	0.14	ND	0.14	0.23	0.16	ND	0.16
Fluorene	30	100	100	500	mg/kg	ND 0.070 I	0.2	ND	0.2	ND	0.18	ND	0.17		0.17	ND	0.17	ND	0.18	0.024J	0.2	ND	0.2
Phenanthrene	100	100	100	500	mg/kg	0.072J	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.41	0.12	ND	0.12
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1		0.1	ND	0.1	ND	0.11	0.055J	0.12	ND	0.12
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND 0.004 I	0.16	ND	0.16	ND	0.15	ND	0.14		0.14	ND	0.14	ND	0.14	0.21	0.16	ND	0.16
Pyrene	100	100	100	500	mg/kg	0.081J	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.1	ND	0.11	0.68	0.12	ND	0.12

				LO	CATION	S-32 SUR	FACE	S-32 (3	3-4)	S-32 ((6-7)	S-32 (1	3-14)	S-32 (1	7-18)	S-32 (2	2-23)	S-32 (4	5-46)	S-33 SUR	FACE	S-33 (4	1-5)
				SAMPLI	NG DATE	11/10/2	2020	11/10/2	2020	11/10/	2020	11/10/	2020	11/10/	2020	11/10/2	2020	11/17/2	2020	11/4/2	020	11/4/20	020
				LAB SA	MPLE ID	L2049628	3-01 R1	L204962	28-02	L20496	28-03	L20496	28-04	L20496	28-05	L20496	28-06	L20510	11-03	L204848	39-05	L204848	39-06
		SAMPI	LE DEPTH	INTERVA	L (FEET)	0-1		3-4	,	6-7	7	13-	14	17-1	18	22-2	23	45-4	16	0-1		4-5	
				SAMP	LE TYPE	SOI	L	SOI	L	SOI	IL	SO	IL	SOI	IL	SOI	L	SOI	L	SOI	L	SOII	Ĺ
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.46	ND	0.46	ND	0.42	ND	0.39	ND	0.39	ND	0.39	ND	0.4	ND	0.46	ND	0.46
4-Chloroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2-Nitroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
3-Nitroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
4-Nitroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Dibenzofuran	7	14	59	350	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2-Methylnaphthalene					mg/kg	ND	0.24	ND	0.24	ND	0.22	ND	0.2	ND	0.2	ND	0.21	ND	0.21	ND	0.24	ND	0.24
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Acetophenone					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2,4,6-Trichlorophenol					mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12
p-Chloro-m-cresol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2-Chlorophenol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2,4-Dichlorophenol					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.15	ND	0.16	ND	0.16	ND	0.18	ND	0.18
2,4-Dimethylphenol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2-Nitrophenol					mg/kg	ND	0.44	ND	0.43	ND	0.4	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.44	ND	0.44
4-Nitrophenol					mg/kg	ND	0.28	ND	0.28	ND	0.26	ND	0.24	ND	0.24	ND	0.24	ND	0.25	ND	0.28	ND	0.28
2,4-Dinitrophenol					mg/kg	ND	0.98	ND	0.96	ND	0.89	ND	0.81	ND	0.82	ND	0.83	ND	0.85	ND	0.97	ND	0.97
4,6-Dinitro-o-cresol					mg/kg	ND	0.53	ND	0.52	ND	0.48	ND	0.44	ND	0.44	ND	0.45	ND	0.46	ND	0.52	ND	0.52
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16
Phenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.29	ND	0.29	ND	0.27	ND	0.24	ND	0.24	ND	0.25	ND	0.25	ND	0.29	ND	0.29
2,4,5-Trichlorophenol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Benzoic Acid					mg/kg	ND	0.66	ND	0.65	ND	0.6	ND	0.55	ND	0.55	ND	0.56	ND	0.57	ND	0.65	ND	0.65
Benzyl Alcohol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.2	ND	0.2
Carbazole					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.18	0.034J	0.2	ND	0.2
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.031	ND	0.03	ND	0.028	ND	0.025	ND	0.026	ND	0.026	ND	0.026	ND	0.03	ND	0.03

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Highlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

		LOCATION SAMPLING DATE LAB SAMPLE ID				S-33 (c		S-33 (1		S-33 (1 11/4/2		S-33 (2 11/12/	- /	S-33 (4	- /	S-34 SUI		S-34 (` /	S-34 (/	S-34 (1: 11/6/2	
						L204848	39-07	L20484	89-08	L20484	89-09	L20502		L20510		L20491	113-01	L20491		L20491		L20491	
		SAMPI	LE DEPTH	INTERVA	L (FEET)	6-7	'	13-	14	16-1	7	22-2	23	44-4	15	0-	1	4-:	5	7-8	3	13-1	14
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SO	IL	SOI	L	SO	IL	SO	IL	SOI	L	SOI	L
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	1.1	0.15	0.36	0.15	ND	0.15	ND	0.14
1,2,4-Trichlorobenzene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.1
Bis(2-chloroethyl)ether					mg/kg	ND	0.18	ND	0.15	ND	0.15	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.16	ND	0.16
2-Chloronaphthalene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
3,3'-Dichlorobenzidine					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2,4-Dinitrotoluene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2,6-Dinitrotoluene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Fluoranthene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	0.038J	0.1	ND	0.12	ND	0.12	16	2.2	4.4	0.11	0.027J	0.11	0.22	0.1
4-Chlorophenyl phenyl ether					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
4-Bromophenyl phenyl ether					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.24	ND	0.2	ND	0.21	ND	0.23	ND	0.23	ND	0.22	ND	0.22	ND	0.22	ND	0.21
Bis(2-chloroethoxy)methane					mg/kg	ND	0.22	ND	0.18	ND	0.18	ND	0.21	ND	0.21	ND	0.2	ND	0.2	ND	0.2	ND	0.19
Hexachlorobutadiene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Hexachlorocyclopentadiene					mg/kg	ND	0.57	ND	0.49	ND	0.49	ND	0.56	ND	0.55	ND	0.53	ND	0.54	ND	0.52	ND	0.5
Hexachloroethane					mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.14
Isophorone					mg/kg	ND	0.18	ND	0.15	ND	0.15	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.16	ND	0.16
Naphthalene	12	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	1.4	0.19	0.28	0.19	ND	0.18	0.029J	0.17
Nitrobenzene					mg/kg	ND	0.18	ND	0.15	ND	0.15	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.16	ND	0.16
NDPA/DPA					mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.14
n-Nitrosodi-n-propylamine					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	0.95	0.19	0.47	0.19	ND	0.18	ND	0.17
Butyl benzyl phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	120	3.7	64	1.9	ND	0.18	ND	0.17
Di-n-butylphthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	0.23	0.19	0.17J	0.19	ND	0.18	ND	0.17
Di-n-octylphthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Diethyl phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Dimethyl phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.12	ND	0.1	0.022J	0.1	ND	0.12	ND	0.12	5.4	0.11	2.3	0.11	ND	0.11	0.092J	0.1
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	4.4	0.15	1.8	0.15	ND	0.15	0.076J	0.14
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	6.1	0.11	2.3	0.11	ND	0.11	0.11	0.1
Benzo(k)fluoranthene	8.0	1	3.9	56	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	1.7	0.11	0.89	0.11	ND	0.11	0.035J	0.1
Chrysene	1	1	3.9	56	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	4.6	0.11	1.8	0.11	ND	0.11	0.091J	0.1
Acenaphthylene	100	100	100	500	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	0.58	0.15	0.21	0.15	ND	0.15	ND	0.14
Anthracene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	2.6	0.11	0.94	0.11	ND	0.11	ND	0.1
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	2.9	0.15	1.2	0.15	ND	0.15	0.058J	0.14
Fluorene	30	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	1.2	0.19	0.34	0.19	ND	0.18	ND	0.17
Phenanthrene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	0.026J	0.1	ND	0.12	ND	0.12	13	2.2	3.4	0.11	0.026J	0.11	0.18	0.1
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	1	0.11	0.28	0.11	ND	0.11	ND	0.1
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	3	0.15	1.2	0.15	ND	0.15	0.054J	0.14
Pyrene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	0.031J	0.1	ND	0.12	ND	0.12	13	2.2	3.6	0.11	0.023J	0.11	0.17	0.1
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				LO	CATION	S-33 (6	i-7)	S-33 (1	3-14)	S-33 (1	6-17)	S-33 (2	2-23)	S-33 (4	4-45)	S-34 SUI	RFACE	S-34 ((4-5)	S-34	(7-8)	S-34 (13	3-14)
				SAMPLIN	NG DATE	11/4/20	020	11/4/2	2020	11/4/2	020	11/12/	2020	11/17/2	2020	11/6/2	2020	11/6/2	2020	11/6/2	2020	11/6/20	020
				LAB SA	MPLE ID	L204848	9-07	L20484	89-08	L20484	89-09	L20502	25-01	L20510	11-02	L20491	13-01	L20491	13-02	L20491	113-03	L204911	13-04
		SAMPI	LE DEPTH	INTERVA	L (FEET)	6-7		13-1	14	16-1	7	22-2	23	44-4	15	0-1	1	4-:	5	7-	8	13-1	4
				SAMP	LE TYPE	SOII	_	SOI	L	SOI	L	SOI	L	SOI	L	SOI	IL	SO	IL	SO	IL	SOII	L
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.46	ND	0.39	ND	0.39	ND	0.45	ND	0.44	0.14J	0.42	ND	0.43	ND	0.42	ND	0.39
4-Chloroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2-Nitroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
3-Nitroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
4-Nitroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Dibenzofuran	7	14	59	350	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	0.88	0.19	0.25	0.19	ND	0.18	ND	0.17
2-Methylnaphthalene					mg/kg	ND	0.24	ND	0.2	ND	0.21	ND	0.23	ND	0.23	0.84	0.22	0.14J	0.22	ND	0.22	0.075J	0.21
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Acetophenone					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2,4,6-Trichlorophenol					mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.12	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.1
p-Chloro-m-cresol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2-Chlorophenol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2,4-Dichlorophenol					mg/kg	ND	0.18	ND	0.15	ND	0.15	ND	0.18	ND	0.17	ND	0.17	ND	0.17	ND	0.16	ND	0.16
2,4-Dimethylphenol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2-Nitrophenol					mg/kg	ND	0.43	ND	0.37	ND	0.37	ND	0.42	ND	0.42	ND	0.4	ND	0.4	ND	0.39	ND	0.37
4-Nitrophenol					mg/kg	ND	0.28	ND	0.24	ND	0.24	ND	0.27	ND	0.27	ND	0.26	ND	0.26	ND	0.26	ND	0.24
2,4-Dinitrophenol					mg/kg	ND	0.96	ND	0.82	ND	0.82	ND	0.94	ND	0.92	ND	0.9	ND	0.9	ND	0.88	ND	0.83
4,6-Dinitro-o-cresol					mg/kg	ND	0.52	ND	0.44	ND	0.45	ND	0.51	ND	0.5	ND	0.48	ND	0.49	ND	0.47	ND	0.45
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.16	ND	0.15	ND	0.15	ND	0.15	ND	0.15	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	0.044J	0.19	ND	0.19	ND	0.18	ND	0.17
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.29	ND	0.25	ND	0.25	ND	0.28	ND	0.28	0.12J	0.27	0.03J	0.27	ND	0.26	ND	0.25
2,4,5-Trichlorophenol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Benzoic Acid					mg/kg	ND	0.65	ND	0.56	ND	0.56	ND	0.63	ND	0.62	ND	0.6	ND	0.61	ND	0.59	ND	0.56
Benzyl Alcohol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.18	ND	0.17
Carbazole					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.2	ND	0.19	1.8	0.19	0.68	0.19	ND	0.18	0.028J	0.17
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.03	ND	0.026	ND	0.026	ND	0.029	ND	0.029	ND	0.028	ND	0.028	ND	0.027	ND	0.026

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

ghlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

						S-34 (1	8-19)	S-34 (2	3-24)	S-34 (4	9-50)	S-35 (SUR	FACE)	S-35 (4	l-5)	S-35 (7-8)	S-35 (1	1-12)	S-35 (1	8-19)	S-35 (21	1-22)
						11/6/2		11/6/2	- /	11/17/2	,	11/6/20		11/6/20		11/6/2		11/6/2	,	11/6/2		11/6/2	
					MPLE ID	L20491		L20491		L20510		L204911		L204911		L20491		L20491		L20491		L204911	
		SAMPI	LE DEPTH	INTERVA		18-1		23-		49-5		0-1		4-5		7-8		11-		18-		21-2	
		5111111	DE DEI III		PLE TYPE	SOI		SO		SOI		SOI		SOII		SOI		SO		SO		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.14	ND	0.14	0.064J	0.14	ND	0.16	ND	0.16	0.021J	0.15	0.22	0.14	ND	0.14	0.091J	0.14
1,2,4-Trichlorobenzene					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.1
Bis(2-chloroethyl)ether					mg/kg	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.15	ND	0.15
2-Chloronaphthalene					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
3,3'-Dichlorobenzidine					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2,4-Dinitrotoluene					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2,6-Dinitrotoluene					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Fluoranthene	100	100	100	500	mg/kg	ND	0.1	0.021J	0.1	ND	0.11	0.064J	0.12	ND	0.12	0.17	0.11	1.8	0.1	ND	0.1	0.99	0.1
4-Chlorophenyl phenyl ether					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
4-Bromophenyl phenyl ether					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.21	ND	0.21	ND	0.22	ND	0.24	ND	0.24	ND	0.22	ND	0.2	ND	0.2	ND	0.2
Bis(2-chloroethoxy)methane					mg/kg	ND	0.19	ND	0.19	ND	0.2	ND	0.22	ND	0.22	ND	0.2	ND	0.18	ND	0.18	ND	0.18
Hexachlorobutadiene					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Hexachlorocyclopentadiene					mg/kg	ND	0.5	ND	0.5	ND	0.52	ND	0.58	ND	0.58	ND	0.53	ND	0.49	ND	0.49	ND	0.49
Hexachloroethane					mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14
Isophorone					mg/kg	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.15	ND	0.15
Naphthalene	12	100	100	500	mg/kg	ND	0.18	ND	0.17	0.15J	0.18	ND	0.2	ND	0.2	0.031J	0.18	0.33	0.17	ND	0.17	0.048J	0.17
Nitrobenzene					mg/kg	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.15	ND	0.15
NDPA/DPA					mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14
n-Nitrosodi-n-propylamine					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Butyl benzyl phthalate					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Di-n-butylphthalate					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Di-n-octylphthalate					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Diethyl phthalate					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Dimethyl phthalate					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.1	ND	0.11	0.038J	0.12	ND	0.12	0.084J	0.11	0.9	0.1	ND	0.1	0.49	0.1
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	0.076J	0.15	0.82	0.14	ND	0.14	0.44	0.14
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.1	ND	0.11	0.034J	0.12	ND	0.12	0.089J	0.11	0.95	0.1	ND	0.1	0.54	0.1
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12	0.037J	0.11	0.42	0.1	ND	0.1	0.19	0.1
Chrysene	1	1	3.9	56	mg/kg	ND	0.1	ND	0.1	ND	0.11	0.031J	0.12	ND	0.12	0.077J	0.11	0.84	0.1	ND	0.1	0.46	0.1
Acenaphthylene	100	100	100	500	mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15	0.034J	0.14	ND	0.14	ND	0.14
Anthracene	100	100	100	500	mg/kg	ND	0.1	ND	0.1	0.053J	0.11	ND	0.12	ND	0.12	ND	0.11	0.4	0.1	ND	0.1	0.2	0.1
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	0.046J	0.15	0.44	0.14	ND	0.14	0.24	0.14
Fluorene	30	100	100	500	mg/kg	ND	0.18	ND	0.17	0.2	0.18	ND	0.2	ND	0.2	0.025J	0.18	0.25	0.17	ND	0.17	0.11J	0.17
Phenanthrene	100	100	100	500	mg/kg	ND	0.1	ND	0.1	0.16	0.11	0.053J	0.12	ND	0.12	0.17	0.11	1.6	0.1	ND	0.1	0.84	0.1
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	0.12	0.1	ND	0.1	0.066J	0.1
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	0.046J	0.15	0.5	0.14	ND	0.14	0.28	0.14
Pyrene	100	100	100	500	mg/kg	ND	0.1	ND	0.1	0.048J	0.11	0.053J	0.12	ND	0.12	0.14	0.11	1.5	0.1	ND	0.1	0.78	0.1

				1.0	CATION	S-34 (1	8-19)	S-34 (2	3-24)	S-34 (4	19-50)	S-35 (SUR	FACE)	S-35 (4	-5)	S-35 ('	7-8)	S-35 (1	1-12)	S-35 (1	(8-10)	S-35 (2)	1-22)
				SAMPLIN		11/6/2	/	11/6/2	/	11/17/	/	11/6/2	- /	11/6/20		11/6/2	- /	11/6/2	,	11/6/2	/	11/6/2	/
				LAB SA		L20491		L20491		L20510		L20491		L204911		L20491	0=0	L20491		L20491		L20491	
		SAMPI	LE DEPTH	INTERVA		18-1		23-2		49-		0-1		4-5	2 00	7-8		11-1		18-		21-2	_
		D121,12	32 221 111		LE TYPE	SOI		SO		SO		SOI		SOII	_	SOI		SOI		SO		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.4	ND	0.4	ND	0.41	ND	0.46	ND	0.46	ND	0.42	ND	0.39	ND	0.39	ND	0.39
4-Chloroaniline					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2-Nitroaniline					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
3-Nitroaniline					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
4-Nitroaniline					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Dibenzofuran	7	14	59	350	mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	0.15J	0.17	ND	0.17	0.061J	0.17
2-Methylnaphthalene					mg/kg	ND	0.21	ND	0.21	1.4	0.22	ND	0.24	ND	0.24	ND	0.22	0.16J	0.2	ND	0.2	0.026J	0.2
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Acetophenone					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2,4,6-Trichlorophenol					mg/kg	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.1
p-Chloro-m-cresol					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2-Chlorophenol					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2,4-Dichlorophenol					mg/kg	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.15	ND	0.15
2,4-Dimethylphenol					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2-Nitrophenol					mg/kg	ND	0.38	ND	0.38	ND	0.39	ND	0.44	ND	0.44	ND	0.4	ND	0.37	ND	0.37	ND	0.37
4-Nitrophenol					mg/kg	ND	0.24	ND	0.24	ND	0.25	ND	0.28	ND	0.28	ND	0.26	ND	0.24	ND	0.24	ND	0.24
2,4-Dinitrophenol					mg/kg	ND	0.84	ND	0.84	ND	0.87	ND	0.98	ND	0.98	ND	0.89	ND	0.82	ND	0.82	ND	0.82
4,6-Dinitro-o-cresol					mg/kg	ND	0.46	ND	0.45	ND	0.47	ND	0.53	ND	0.53	ND	0.48	ND	0.44	ND	0.44	ND	0.44
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.25	ND	0.25	ND	0.26	ND	0.29	ND	0.29	ND	0.27	ND	0.24	ND	0.24	ND	0.25
2,4,5-Trichlorophenol					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Benzoic Acid					mg/kg	ND	0.57	ND	0.57	ND	0.58	ND	0.66	ND	0.66	ND	0.6	ND	0.55	ND	0.55	ND	0.56
Benzyl Alcohol					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.17	ND	0.17
Carbazole					mg/kg	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	0.021J	0.18	0.23	0.17	ND	0.17	0.1J	0.17
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.026	ND	0.026	ND	0.027	ND	0.03	ND	0.03	ND	0.028	ND	0.026	ND	0.026	ND	0.026

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

ighlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and CSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

		LOCATION SAMPLING DATE			S-35 (5		S-36 SUF		S-36 (4	/	S-36 ((/	S-36 (13 11/6/20	,	S-36 (18	/	S-36 (2		S-36 (5	/	S-37 SUR		
					. –	11/16/2		11/6/2 L20491				L20491				11/6/2		L20491				11/10/2 L204962	
		CAMD	I E DEDELL		MPLE ID	L20507				L20491	_	L20491 8-9		L204911		L20491		22-		L20507			
		SAMI	LE DEPTH		L (FEE1) LE TYPE	51-5 SOI		0-1 SOI		SOI		SO		SOII		18-1 SOI		SOI		SO:		0-1 SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.14	0.023J	0.14	0.019J	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	ND ND	0.15
1.2.4-Trichlorobenzene				000	mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.11	ND	0.1	ND	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	ND	0.12
Bis(2-chloroethyl)ether					mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.17	ND	0.16	ND	0.17	ND	0.15	ND	0.16	ND	0.17
2-Chloronaphthalene					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
3,3'-Dichlorobenzidine					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2,4-Dinitrotoluene					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2,6-Dinitrotoluene					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Fluoranthene	100	100	100	500	mg/kg	0.052J	0.11	0.25	0.1	0.45	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.6	0.12
4-Chlorophenyl phenyl ether					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
4-Bromophenyl phenyl ether					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.21	ND	0.21	ND	0.2	ND	0.23	ND	0.21	ND	0.22	ND	0.2	ND	0.21	ND	0.23
Bis(2-chloroethoxy)methane					mg/kg	ND	0.19	ND	0.19	ND	0.18	ND	0.21	ND	0.19	ND	0.2	ND	0.18	ND	0.19	ND	0.21
Hexachlorobutadiene					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Hexachlorocyclopentadiene					mg/kg	ND	0.51	ND	0.5	ND	0.48	ND	0.55	ND	0.49	ND	0.53	ND	0.48	ND	0.5	ND	0.55
Hexachloroethane					mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	ND	0.15
Isophorone					mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.17	ND	0.16	ND	0.17	ND	0.15	ND	0.16	ND	0.17
Naphthalene	12	100	100	500	mg/kg	ND	0.18	ND	0.18	0.097J	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Nitrobenzene					mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.17	ND	0.16	ND	0.17	ND	0.15	ND	0.16	ND	0.17
NDPA/DPA					mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	ND	0.15
n-Nitrosodi-n-propylamine					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Butyl benzyl phthalate					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Di-n-butylphthalate					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Di-n-octylphthalate					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Diethyl phthalate					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Dimethyl phthalate					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Benzo(a)anthracene	1	1	1	5.6	mg/kg	0.029J	0.11	0.12	0.1	0.21	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.29	0.12
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.14	0.11J	0.14	0.2	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	0.28	0.15
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.11	0.13	0.1	0.22	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.37	0.12
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.11	0.05J	0.1	0.09J	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.11J	0.12
Chrysene	1	1	3.9	56	mg/kg	0.025J	0.11	0.11	0.1	0.21	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.28	0.12
Acenaphthylene	100	100	100	500	mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	ND	0.15
Anthracene	100	100	100	500	mg/kg	ND	0.11	0.052J	0.1	0.05J	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.057J	0.12
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.14	0.066J	0.14	0.12J	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	0.19	0.15
Fluorene	30	100	100	500	mg/kg	ND	0.18	0.033J	0.18	0.017J	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Phenanthrene	100	100	100	500	mg/kg	0.039J	0.11	0.22	0.1	0.23	0.1	ND	0.12	ND	0.1	0.025J	0.11	ND	0.1	ND	0.1	0.31	0.12
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.11	ND	0.1	0.028J	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.048J	0.12
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.14	0.067J	0.14	0.13	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	0.2	0.15
Pyrene	100	100	100	500	mg/kg	0.041J	0.11	0.2	0.1	0.41	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	0.59	0.12
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				LO	CATION	S-35 (51	1-52)	S-36 SUI	RFACE	S-36 (4-5)	S-36 ((8-9)	S-36 (13	3-14)	S-36 (1	8-19)	S-36 (2	2-23)	S-36 (5	53-54)	S-37 SUR	RFACE
				SAMPLIN	NG DATE	11/16/2	2020	11/6/2	2020	11/6/2	020	11/6/2	2020	11/6/20	020	11/6/2	2020	11/6/2	2020	11/16/	2020	11/10/2	2020
				LAB SA	MPLE ID	L205070	06-04	L20491	13-13	L20491	13-14	L20491	13-15	L204911	3-16	L20491	13-17	L20491	13-18	L20507	706-03	L20496	28-07
		SAMPI	LE DEPTH	INTERVA	L (FEET)	51-5	2	0-1	1	4-5	5	8-9	9	13-14	4	18-1	19	22-2	23	53-	54	0-1	
				SAMP	LE TYPE	SOI	L	SOI	L	SOI	L	SOI	IL	SOII	L	SOI	L	SOI	IL	SO	IL	SOI	L
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.4	ND	0.4	ND	0.38	ND	0.44	ND	0.39	ND	0.42	ND	0.38	ND	0.4	ND	0.44
4-Chloroaniline					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2-Nitroaniline					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
3-Nitroaniline					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
4-Nitroaniline					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Dibenzofuran	7	14	59	350	mg/kg	ND	0.18	0.022J	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2-Methylnaphthalene					mg/kg	ND	0.21	ND	0.21	0.042J	0.2	ND	0.23	ND	0.21	ND	0.22	ND	0.2	ND	0.21	ND	0.23
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Acetophenone					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2,4,6-Trichlorophenol					mg/kg	ND	0.11	ND	0.1	ND	0.1	ND	0.12	ND	0.1	ND	0.11	ND	0.1	ND	0.1	ND	0.12
p-Chloro-m-cresol					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2-Chlorophenol					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2,4-Dichlorophenol					mg/kg	ND	0.16	ND	0.16	ND	0.15	ND	0.17	ND	0.16	ND	0.17	ND	0.15	ND	0.16	ND	0.17
2,4-Dimethylphenol					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2-Nitrophenol					mg/kg	ND	0.38	ND	0.38	ND	0.36	ND	0.42	ND	0.37	ND	0.4	ND	0.36	ND	0.38	ND	0.42
4-Nitrophenol					mg/kg	ND	0.25	ND	0.25	ND	0.23	ND	0.27	ND	0.24	ND	0.26	ND	0.23	ND	0.25	ND	0.27
2,4-Dinitrophenol					mg/kg	ND	0.85	ND	0.84	ND	8.0	ND	0.93	ND	0.83	ND	0.89	ND	8.0	ND	0.84	ND	0.93
4,6-Dinitro-o-cresol					mg/kg	ND	0.46	ND	0.46	ND	0.43	ND	0.5	ND	0.45	ND	0.48	ND	0.44	ND	0.46	ND	0.5
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.15	ND	0.14	ND	0.15	ND	0.13	ND	0.14	ND	0.15
Phenol	0.33	100	100	500	mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.26	ND	0.25	ND	0.24	ND	0.28	ND	0.25	ND	0.27	ND	0.24	ND	0.25	ND	0.28
2,4,5-Trichlorophenol					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Benzoic Acid					mg/kg	ND	0.57	ND	0.57	ND	0.54	ND	0.63	ND	0.56	ND	0.6	ND	0.54	ND	0.57	ND	0.63
Benzyl Alcohol					mg/kg	ND	0.18	ND	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19
Carbazole					mg/kg	ND	0.18	0.024J	0.18	ND	0.17	ND	0.19	ND	0.17	ND	0.18	ND	0.17	ND	0.18	0.03J	0.19
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.026	ND	0.026	ND	0.025	ND	0.029	ND	0.026	ND	0.028	ND	0.025	ND	0.026	ND	0.029

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

nlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and C

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

		LOCATION				S-37 (4	I-5)	S-37 ((8-9)	S-37 (12	2-13)	S-37 (1	6-17)	S-37 (22	2-23)	S-37 (50	0-51)	S-38 SUR	REACE	S-38 (4-5)	S-38 ((6-7)
				SAMPLI		11/10/2		11/10/		11/10/2		11/10/2		11/12/2		11/16/2		11/10/2		11/10/2		11/10/	` /
					MPLE ID	L204962		L20496		L204962		L20496		L205022		L205070		L20496		L20496		L20496	
		SAMPI	LE DEPTH	INTERVA		4-5		8-9		12-1		16-1		22-2		50-5		0-1		4-5		6-	
		0.22			LE TYPE	SOI		SO		SOI		SOI		SOI		SOI		SOI		SOI		SO	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.15	ND	0.16	ND	0.14
1,2,4-Trichlorobenzene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.1
Bis(2-chloroethyl)ether					mg/kg	ND	0.18	ND	0.16	ND	0.15	ND	0.16	ND	0.15	ND	0.16	ND	0.17	ND	0.18	ND	0.16
2-Chloronaphthalene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
3,3'-Dichlorobenzidine					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2,4-Dinitrotoluene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2,6-Dinitrotoluene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Fluoranthene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	0.022J	0.1	0.17	0.11	ND	0.1	0.039J	0.11	0.39	0.12	ND	0.12	ND	0.1
4-Chlorophenyl phenyl ether					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
4-Bromophenyl phenyl ether					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.25	ND	0.21	ND	0.2	ND	0.22	ND	0.2	ND	0.22	ND	0.23	ND	0.24	ND	0.21
Bis(2-chloroethoxy)methane					mg/kg	ND	0.22	ND	0.19	ND	0.18	ND	0.19	ND	0.18	ND	0.2	ND	0.21	ND	0.22	ND	0.19
Hexachlorobutadiene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Hexachlorocyclopentadiene					mg/kg	ND	0.59	ND	0.5	ND	0.49	ND	0.52	ND	0.49	ND	0.52	ND	0.55	ND	0.57	ND	0.5
Hexachloroethane					mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.15	ND	0.16	ND	0.14
Isophorone					mg/kg	ND	0.18	ND	0.16	ND	0.15	ND	0.16	ND	0.15	ND	0.16	ND	0.17	ND	0.18	ND	0.16
Naphthalene	12	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Nitrobenzene					mg/kg	ND	0.18	ND	0.16	ND	0.15	ND	0.16	ND	0.15	ND	0.16	ND	0.17	ND	0.18	ND	0.16
NDPA/DPA					mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.15	ND	0.16	ND	0.14
n-Nitrosodi-n-propylamine					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Butyl benzyl phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Di-n-butylphthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Di-n-octylphthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Diethyl phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Dimethyl phthalate					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.12	ND	0.1	ND	0.1	0.073J	0.11	ND	0.1	0.02J	0.11	0.23	0.12	ND	0.12	ND	0.1
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.16	ND	0.14	ND	0.14	0.06J	0.14	ND	0.14	ND	0.14	0.22	0.15	ND	0.16	ND	0.14
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.12	ND	0.1	ND	0.1	0.079J	0.11	ND	0.1	ND	0.11	0.26	0.12	ND	0.12	ND	0.1
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.11	ND	0.1	ND	0.11	0.093J	0.12	ND	0.12	ND	0.1
Chrysene	1	1	3.9	56	mg/kg	ND	0.12	ND	0.1	ND	0.1	0.068J	0.11	ND	0.1	ND	0.11	0.18	0.12	ND	0.12	ND	0.1
Acenaphthylene	100	100	100	500	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.15	ND	0.16	ND	0.14
Anthracene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.1
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.16	ND	0.14	ND	0.14	0.036J	0.14	ND	0.14	ND	0.14	0.12J	0.15	ND	0.16	ND	0.14
Fluorene	30	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Phenanthrene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	ND	0.1	0.13	0.11	ND	0.1	0.035J	0.11	0.07J	0.12	ND	0.12	ND	0.1
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.11	ND	0.1	ND	0.11	0.034J	0.12	ND	0.12	ND	0.1
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.16	ND	0.14	ND	0.14	0.042J	0.14	ND	0.14	ND	0.14	0.15	0.15	ND	0.16	ND	0.14
Pyrene	100	100	100	500	mg/kg	ND	0.12	ND	0.1	0.02J	0.1	0.15	0.11	ND	0.1	0.032J	0.11	0.36	0.12	ND	0.12	ND	0.1

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LO	CATION	S-37 (4	4-5)	S-37 (8-9)	S-37 (1	2-13)	S-37 (1	6-17)	S-37 (22	2-23)	S-37 (5	(0-51)	S-38 SUI	REACE	S-38 (4	4-5)	S-38 (6-7)
				SAMPLIN		11/10/2	- /	11/10/	/	11/10/	- /	11/10/		11/12/2	- /	11/16/	,	11/10/		11/10/2	- /	11/10/2	(- /
					MPLE ID	L20496	28-08	L20496	28-09	L20496	28-10	L20496	28-11	L205022		L20507		L20496		L20496		L20496	28-14
		SAMPI	LE DEPTH	INTERVA		4-5		8-9		12-1		16-1		22-2		50-		0-1		4-5		6-7	
					LE TYPE	SOI		SO		SOI	_	SO		SOI	_	SO		SOI		SOI		SOI	īL
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.47	ND	0.4	ND	0.39	ND	0.41	ND	0.39	ND	0.41	ND	0.44	ND	0.46	ND	0.4
4-Chloroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2-Nitroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
3-Nitroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
4-Nitroaniline					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Dibenzofuran	7	14	59	350	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2-Methylnaphthalene					mg/kg	ND	0.25	ND	0.21	ND	0.2	ND	0.22	ND	0.2	ND	0.22	ND	0.23	ND	0.24	ND	0.21
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Acetophenone					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2,4,6-Trichlorophenol					mg/kg	ND	0.12	ND	0.1	ND	0.1	ND	0.11	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.1
p-Chloro-m-cresol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2-Chlorophenol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2,4-Dichlorophenol					mg/kg	ND	0.18	ND	0.16	ND	0.15	ND	0.16	ND	0.15	ND	0.16	ND	0.17	ND	0.18	ND	0.16
2,4-Dimethylphenol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2-Nitrophenol					mg/kg	ND	0.44	ND	0.38	ND	0.37	ND	0.39	ND	0.37	ND	0.39	ND	0.42	ND	0.43	ND	0.37
4-Nitrophenol					mg/kg	ND	0.29	ND	0.24	ND	0.24	ND	0.25	ND	0.24	ND	0.25	ND	0.27	ND	0.28	ND	0.24
2,4-Dinitrophenol					mg/kg	ND	0.99	ND	0.84	ND	0.82	ND	0.86	ND	0.82	ND	0.87	ND	0.93	ND	0.96	ND	0.83
4,6-Dinitro-o-cresol					mg/kg	ND	0.53	ND	0.45	ND	0.44	ND	0.47	ND	0.45	ND	0.47	ND	0.5	ND	0.52	ND	0.45
Pentachlorophenol	8.0	2.4	6.7	6.7	mg/kg	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.15	ND	0.16	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.3	ND	0.25	ND	0.24	ND	0.26	ND	0.25	ND	0.26	ND	0.28	ND	0.29	ND	0.25
2,4,5-Trichlorophenol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Benzoic Acid					mg/kg	ND	0.66	ND	0.57	ND	0.55	ND	0.58	ND	0.56	ND	0.59	ND	0.63	ND	0.65	ND	0.56
Benzyl Alcohol					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
Carbazole					mg/kg	ND	0.2	ND	0.17	ND	0.17	ND	0.18	ND	0.17	ND	0.18	ND	0.19	ND	0.2	ND	0.17
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.031	ND	0.026	ND	0.026	ND	0.027	ND	0.026	ND	0.027	ND	0.029	ND	0.03	ND	0.026

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

ghlight - Detected Above the NYSDEC USCO, RSCO, RRSCO and

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC SAMPLIN	CATION NG DATE	S-38 (1:	- /	S-38 (1	- /	S-38 (2)	S-38 (5	- /	S-39 SURF		S-39 (2	- /	S-39 (· /	S-39 (1	- /	S-39 (1 11/5/2	/
				LAB SA	. –	L20496		L20502		L20502		L20502		L2048489	-	L204848		L20484		L20484		L20488	
		SAMPI	LE DEPTH	INTERVA		13-1		16-		23-2		51-5		0-1	-01	2-3		7-8		12-		18-1	
		5111111			LE TYPE	SOI		SO		SOI		SOI		SOIL		SOI		SO		SO		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	2.4	1.7	ND	0.16	ND	0.14	ND	0.14	ND	0.14
1,2,4-Trichlorobenzene					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	ND	1.3	ND	0.12	ND	0.1	ND	0.1	ND	0.11
Bis(2-chloroethyl)ether					mg/kg	ND	0.15	ND	0.18	ND	0.16	ND	0.16	ND	1.9	ND	0.18	ND	0.16	ND	0.16	ND	0.16
2-Chloronaphthalene					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
3,3'-Dichlorobenzidine					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2,4-Dinitrotoluene					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2,6-Dinitrotoluene					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Fluoranthene	100	100	100	500	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	39	1.3	0.14	0.12	ND	0.1	ND	0.1	ND	0.11
4-Chlorophenyl phenyl ether					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
4-Bromophenyl phenyl ether					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.2	ND	0.25	ND	0.21	ND	0.21	ND	2.5	ND	0.24	ND	0.21	ND	0.21	ND	0.21
Bis(2-chloroethoxy)methane					mg/kg	ND	0.18	ND	0.22	ND	0.19	ND	0.19	ND	2.3	ND	0.22	ND	0.19	ND	0.19	ND	0.19
Hexachlorobutadiene					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Hexachlorocyclopentadiene					mg/kg	ND	0.48	ND	0.59	ND	0.49	ND	0.5	ND	6.1	ND	0.58	ND	0.5	ND	0.49	ND	0.51
Hexachloroethane					mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	ND	1.7	ND	0.16	ND	0.14	ND	0.14	ND	0.14
Isophorone					mg/kg	ND	0.15	ND	0.18	ND	0.16	ND	0.16	ND	1.9	ND	0.18	ND	0.16	ND	0.16	ND	0.16
Naphthalene	12	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	2.6	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Nitrobenzene					mg/kg	ND	0.15	ND	0.18	ND	0.16	ND	0.16	ND	1.9	ND	0.18	ND	0.16	ND	0.16	ND	0.16
NDPA/DPA					mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	ND	1.7	ND	0.16	ND	0.14	ND	0.14	ND	0.14
n-Nitrosodi-n-propylamine					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	4.9	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Butyl benzyl phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	1.9J	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Di-n-butylphthalate					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Di-n-octylphthalate					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Diethyl phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Dimethyl phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	21	1.3	0.069J	0.12	ND	0.1	ND	0.1	ND	0.11
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	17	1.7	0.057J	0.16	ND	0.14	ND	0.14	ND	0.14
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	24	1.3	0.068J	0.12	ND	0.1	ND	0.1	ND	0.11
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	7.4	1.3	ND	0.12	ND	0.1	ND	0.1	ND	0.11
Chrysene	1	1	3.9	56	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	17	1.3	0.066J	0.12	ND	0.1	ND	0.1	ND	0.11
Acenaphthylene	100	100	100	500	mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	2.2	1.7	ND	0.16	ND	0.14	ND	0.14	ND	0.14
Anthracene	100	100	100	500	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	7.3	1.3	ND	0.12	ND	0.1	ND	0.1	ND	0.11
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	11	1.7	0.03J	0.16	ND	0.14	ND	0.14	ND	0.14
Fluorene	30	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	2.4	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Phenanthrene	100	100	100	500	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	31	1.3	0.077J	0.12	ND	0.1	ND	0.1	ND	0.11
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	2.8	1.3	ND	0.12	ND	0.1	ND	0.1	ND	0.11
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	12	1.7	0.029J	0.16	ND	0.14	ND	0.14	ND	0.14
Pyrene	100	100	100	500	mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	31	1.3	0.12	0.12	ND	0.1	ND	0.1	ND	0.11

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LO	CATION	S-38 (1	3-14)	S-38 (1	16-17)	S-38 (2	23-24)	S-38 (5	(1-52)	S-39 SURI	FACE	S-39 (2-3)	S-39 ('	7-8)	S-39 (1	2-13)	S-39 (1	8-19)
				SAMPLIN		11/10/2	- /	11/12/	- /	11/12/	- /	11/12/	- /	11/4/20		11/4/2	- /	11/4/2	- /	11/4/2	- /	11/5/2	/
					MPLE ID	L20496	-0-0	L20502		L20502		L20502		L204848	_ ~	L20484		L20484	0=0	L20484	020	L20488	
		SAMPI	LE DEPTH	INTERVA		13-1		16-		23-		51-		0-1	, 01	2-3		7-8		12-1		18-1	
					LE TYPE	SOI		SO		SO		SO		SOII	,	SOI		SOI		SOI		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.39	ND	0.47	ND	0.39	ND	0.4	ND	4.8	ND	0.47	ND	0.4	ND	0.39	ND	0.4
4-Chloroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2-Nitroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
3-Nitroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
4-Nitroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Dibenzofuran	7	14	59	350	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	2.1	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2-Methylnaphthalene					mg/kg	ND	0.2	ND	0.25	ND	0.21	ND	0.21	1J	2.5	ND	0.24	ND	0.21	ND	0.21	ND	0.21
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Acetophenone					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2,4,6-Trichlorophenol					mg/kg	ND	0.1	ND	0.12	ND	0.1	ND	0.1	ND	1.3	ND	0.12	ND	0.1	ND	0.1	ND	0.11
p-Chloro-m-cresol					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2-Chlorophenol					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2,4-Dichlorophenol					mg/kg	ND	0.15	ND	0.18	ND	0.16	ND	0.16	ND	1.9	ND	0.18	ND	0.16	ND	0.16	ND	0.16
2,4-Dimethylphenol					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2-Nitrophenol					mg/kg	ND	0.37	ND	0.44	ND	0.37	ND	0.38	ND	4.6	ND	0.44	ND	0.38	ND	0.37	ND	0.38
4-Nitrophenol					mg/kg	ND	0.24	ND	0.29	ND	0.24	ND	0.24	ND	3	ND	0.29	ND	0.25	ND	0.24	ND	0.25
2,4-Dinitrophenol					mg/kg	ND	0.82	ND	0.98	ND	0.83	ND	0.84	ND	10	ND	0.98	ND	0.84	ND	0.83	ND	0.85
4,6-Dinitro-o-cresol					mg/kg	ND	0.44	ND	0.53	ND	0.45	ND	0.45	ND	5.5	ND	0.53	ND	0.46	ND	0.45	ND	0.46
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.16	ND	0.14	ND	0.14	ND	1.7	ND	0.16	ND	0.14	ND	0.14	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.24	ND	0.3	ND	0.25	ND	0.25	0.35J	3	ND	0.3	ND	0.25	ND	0.25	ND	0.26
2,4,5-Trichlorophenol					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Benzoic Acid					mg/kg	ND	0.55	ND	0.66	ND	0.56	ND	0.56	ND	6.9	ND	0.66	ND	0.57	ND	0.56	ND	0.57
Benzyl Alcohol					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	ND	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
Carbazole					mg/kg	ND	0.17	ND	0.2	ND	0.17	ND	0.17	6	2.1	ND	0.2	ND	0.18	ND	0.17	ND	0.18
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.025	ND	0.031	ND	0.026	ND	0.026	ND	0.32	ND	0.031	ND	0.026	ND	0.026	ND	0.027

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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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USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LO SAMPLIN	CATION NG DATE	S-39 (21 11/11/2		S-39 (4 11/18/	- /	S-40 SUR 11/11/2		S-40 (11/11/		S-40 (7 11/11/2	- /	S-40 (1 11/11/2		S-40 (1	- /	S-40 (2 11/11/	- /	S-40 (51 11/11/2	
				LAB SA		L204985		L20513		L204985		L20498		L204985		L20498		L20498		L20498		L20498	
		SAMPI	LE DEPTH	INTERVA		21-2	2	42-4		0-1		2-3		7-8		11-1	2	16-1	17	23-2	24	51-5	
				SAMP	LE TYPE	SOI	L	SO	IL	SOII	L	SOI	IL	SOII		SOI	L	SOI	L	SOI	L	SOI	L
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
1,2,4-Trichlorobenzene					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
Bis(2-chloroethyl)ether					mg/kg	ND	0.15	ND	0.17	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.16	ND	0.16	ND	0.16
2-Chloronaphthalene					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
3,3'-Dichlorobenzidine					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2,4-Dinitrotoluene					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2,6-Dinitrotoluene					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Fluoranthene	100	100	100	500	mg/kg	ND	0.1	ND	0.11	0.04J	0.12	ND	0.12	0.028J	0.11	ND	0.1	0.038J	0.11	ND	0.1	ND	0.1
4-Chlorophenyl phenyl ether					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
4-Bromophenyl phenyl ether					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.2	ND	0.22	ND	0.24	ND	0.25	ND	0.22	ND	0.2	ND	0.22	ND	0.21	ND	0.21
Bis(2-chloroethoxy)methane					mg/kg	ND	0.18	ND	0.2	ND	0.22	ND	0.22	ND	0.2	ND	0.18	ND	0.19	ND	0.19	ND	0.19
Hexachlorobutadiene					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Hexachlorocyclopentadiene					mg/kg	ND	0.49	ND	0.54	ND	0.58	ND	0.59	ND	0.53	ND	0.48	ND	0.52	ND	0.5	ND	0.5
Hexachloroethane					mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Isophorone					mg/kg	ND	0.15	ND	0.17	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.16	ND	0.16	ND	0.16
Naphthalene	12	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Nitrobenzene					mg/kg	ND	0.15	ND	0.17	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.16	ND	0.16	ND	0.16
NDPA/DPA					mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
n-Nitrosodi-n-propylamine					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Butyl benzyl phthalate					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Di-n-butylphthalate					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Di-n-octylphthalate					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Diethyl phthalate					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Dimethyl phthalate					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.11	0.026J	0.12	ND	0.12	ND	0.11	ND	0.1	0.022J	0.11	ND	0.1	ND	0.1
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
Chrysene	1	1	3.9	56	mg/kg	ND	0.1	ND	0.11	0.024J	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
Acenaphthylene	100	100	100	500	mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Anthracene	100	100	100	500	mg/kg	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Fluorene	30	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Phenanthrene	100	100	100	500	mg/kg	ND	0.1	ND	0.11	0.035J	0.12	ND	0.12	0.024J	0.11	ND	0.1	0.026J	0.11	ND	0.1	ND	0.1
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Pyrene	100	100	100	500	mg/kg	ND	0.1	ND	0.11	0.044J	0.12	ND	0.12	0.022J	0.11	ND	0.1	0.031J	0.11	ND	0.1	ND	0.1

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LO	CATION	S-39 (2)	1-22)	S-39 (4	(2-43)	S-40 SUR	RFACE	S-40 ((2-3)	S-40 (7-8)	S-40 (1	1-12)	S-40 (1	6-17)	S-40 (2	3-24)	S-40 (5	51-52)
				SAMPLIN		11/11/2	/	11/18/	- /	11/11/2		11/11/	2020	11/11/2	- /	11/11/	2020	11/11/	- /	11/11/	- /	11/11/	,
					MPLE ID	L20498	59-08	L20513	96-01	L20498	59-01	L20498	359-02	L204985	59-03	L20498	359-04	L20498	59-05	L20498	59-06	L20498	
		SAMPI	LE DEPTH	INTERVA	L (FEET)	21-2	2	42-	43	0-1		2-	3	7-8		11-	12	16-	17	23-	24	51-	52
				SAMP	LE TYPÉ	SOI	L	SO	IL	SOI	L	SO	IL	SOI	L	SO	IL	SO	IL	SO	IL	SO	IL
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.39	ND	0.43	ND	0.46	ND	0.47	ND	0.42	ND	0.39	ND	0.41	ND	0.4	ND	0.4
4-Chloroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2-Nitroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
3-Nitroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
4-Nitroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Dibenzofuran	7	14	59	350	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2-Methylnaphthalene					mg/kg	ND	0.2	ND	0.22	ND	0.24	ND	0.25	ND	0.22	ND	0.2	ND	0.22	ND	0.21	ND	0.21
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Acetophenone					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2,4,6-Trichlorophenol					mg/kg	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.11	ND	0.1	ND	0.1
p-Chloro-m-cresol					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2-Chlorophenol					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2,4-Dichlorophenol					mg/kg	ND	0.15	ND	0.17	ND	0.18	ND	0.18	ND	0.17	ND	0.15	ND	0.16	ND	0.16	ND	0.16
2,4-Dimethylphenol					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2-Nitrophenol					mg/kg	ND	0.37	ND	0.41	ND	0.44	ND	0.44	ND	0.4	ND	0.37	ND	0.39	ND	0.37	ND	0.38
4-Nitrophenol					mg/kg	ND	0.24	ND	0.26	ND	0.28	ND	0.29	ND	0.26	ND	0.24	ND	0.25	ND	0.24	ND	0.24
2,4-Dinitrophenol					mg/kg	ND	0.82	ND	0.9	ND	0.97	ND	0.99	ND	0.89	ND	0.82	ND	0.87	ND	0.83	ND	0.84
4,6-Dinitro-o-cresol					mg/kg	ND	0.44	ND	0.49	ND	0.52	ND	0.54	ND	0.48	ND	0.44	ND	0.47	ND	0.45	ND	0.45
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.15	ND	0.16	ND	0.16	ND	0.15	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.25	ND	0.27	ND	0.29	ND	0.3	ND	0.27	ND	0.24	ND	0.26	ND	0.25	ND	0.25
2,4,5-Trichlorophenol					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Benzoic Acid					mg/kg	ND	0.56	ND	0.61	ND	0.65	ND	0.67	ND	0.6	ND	0.55	ND	0.58	ND	0.56	ND	0.56
Benzyl Alcohol					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
Carbazole					mg/kg	ND	0.17	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.17	ND	0.18	ND	0.17	ND	0.17
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.026	ND	0.028	ND	0.03	ND	0.031	ND	0.028	ND	0.025	ND	0.027	ND	0.026	ND	0.026

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				SAMPLIN	. –	S-41 SUI 11/5/2	2020	S-41 (11/5/2	2020	S-41 (11/5/2 L20488	2020	S-41 (12 11/5/2 L20488	020	S-41 (17- 11/11/20	020	S-41 (21 11/11/2	2020	S-42 SUI 11/5/2	2020	S-42 (11/5/2 L20488	2020	S-42 (7 11/5/20	2020
		SAMP	LE DEPTH		MPLE ID L (FEET)	L20488		L20488		L20488		12-1		L204985		L204985 21-2		L20488		1,20488		L204884 7-8	
		D121122			LE TYPE	SO		SO		SO		SOI		SOIL		SOI		SO		SO		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	0.4	0.16	ND	0.16	ND	0.15
1,2,4-Trichlorobenzene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11
Bis(2-chloroethyl)ether					mg/kg	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17
2-Chloronaphthalene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
3,3'-Dichlorobenzidine					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2,4-Dinitrotoluene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2,6-Dinitrotoluene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Fluoranthene	100	100	100	500	mg/kg	0.25	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	0.056J	0.11	2.9	0.12	ND	0.12	ND	0.11
4-Chlorophenyl phenyl ether					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
4-Bromophenyl phenyl ether					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.24	ND	0.25	ND	0.22	ND	0.21	ND	0.21	ND	0.22	ND	0.23	ND	0.23	ND	0.22
Bis(2-chloroethoxy)methane					mg/kg	ND	0.21	ND	0.22	ND	0.2	ND	0.19	ND	0.19	ND	0.19	ND	0.21	ND	0.21	ND	0.2
Hexachlorobutadiene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Hexachlorocyclopentadiene					mg/kg	ND	0.56	ND	0.59	ND	0.52	ND	0.5	ND	0.5	ND	0.52	ND	0.56	ND	0.56	ND	0.54
Hexachloroethane					mg/kg	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15
Isophorone					mg/kg	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17
Naphthalene	12	100	100	500	mg/kg	0.056J	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	0.15J	0.2	ND	0.2	ND	0.19
Nitrobenzene					mg/kg	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17
NDPA/DPA					mg/kg	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15
n-Nitrosodi-n-propylamine					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Bis(2-ethylhexyl)phthalate					mg/kg	0.091J	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Butyl benzyl phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Di-n-butylphthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Di-n-octylphthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Diethyl phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Dimethyl phthalate					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Benzo(a)anthracene	1	1	1	5.6	mg/kg	0.13	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	0.03J	0.11	1.3	0.12	ND	0.12	ND	0.11
Benzo(a)pyrene	1	1	1	1	mg/kg	0.11J	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	1.1	0.16	ND	0.16	ND	0.15
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	0.14	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	0.032J	0.11	1.5	0.12	ND	0.12	ND	0.11
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	0.049J	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.11	0.4	0.12	ND	0.12	ND	0.11
Chrysene	1	1	3.9	56	mg/kg	0.12	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	0.027J	0.11	1.2	0.12	ND	0.12	ND	0.11
Acenaphthylene	100	100	100	500	mg/kg	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15
Anthracene	100	100	100	500	mg/kg	0.039J	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.11	0.74	0.12	ND	0.12	ND	0.11
Benzo(ghi)perylene	100	100	100	500	mg/kg	0.074J	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	0.68	0.16	ND	0.16	ND	0.15
Fluorene	30	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	0.32	0.2	ND	0.2	ND	0.19
Phenanthrene	100	100	100	500	mg/kg	0.14	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	0.04J	0.11	2.9	0.12	ND	0.12	ND	0.11
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.11	0.14	0.12	ND	0.12	ND	0.11
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	0.067J	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	0.7	0.16	ND	0.16	ND	0.15
Pyrene	100	100	100	500	mg/kg	0.21	0.12	ND	0.12	ND	0.11	0.017J	0.1	ND	0.1	0.047J	0.11	2.3	0.12	ND	0.12	ND	0.11
. 3	100	100	.00	- 000	9,9	V.E.	0.12	110	V. 12	1,10	<u> </u>	0.0170	<u> </u>	110	U. 1	0.0170	0		V.12	110	V.12		

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LO	CATION	S-41 SUR	RFACE	S-41 ((4-5)	S-41 (7-8)	S-41 (1	2-13)	S-41 (17	7-18)	S-41 (2	1-22)	S-42 SUI	RFACE	S-42 ((3-4)	S-42 ((7-8)
				SAMPLIN	IG DATE	11/5/2	020	11/5/2	2020	11/5/2	2020	11/5/2	2020	11/11/2	020	11/11/2	2020	11/5/2	2020	11/5/2	2020	11/5/2	2020
				LAB SA	MPLE ID	L20488	49-02	L20488	49-03	L20488	49-04	L20488	49-05	L204985	59-09	L20498	59-10	L20488	49-06	L20488	349-07	L20488	349-08
		SAMPI	LE DEPTH	INTERVA	L (FEET)	0-1	L	4-:	5	7-3	8	12-1	13	17-1	8	21-2	22	0-1	1	3-4	4	7-8	8
				SAMP	LE TYPE	SOI	L	SO	IL	SO	IL	SO	IL	SOII	L	SOI	L	SO	IL	SO	IL	SOI	īL
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.45	ND	0.47	ND	0.41	ND	0.4	ND	0.4	ND	0.41	ND	0.44	ND	0.44	ND	0.43
4-Chloroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2-Nitroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
3-Nitroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
4-Nitroaniline					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Dibenzofuran	7	14	59	350	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	0.22	0.2	ND	0.2	ND	0.19
2-Methylnaphthalene					mg/kg	0.04J	0.24	ND	0.25	ND	0.22	ND	0.21	ND	0.21	ND	0.22	0.066J	0.23	ND	0.23	ND	0.22
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Acetophenone					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2,4,6-Trichlorophenol					mg/kg	ND	0.12	ND	0.12	ND	0.11	ND	0.1	ND	0.1	ND	0.11	ND	0.12	ND	0.12	ND	0.11
p-Chloro-m-cresol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2-Chlorophenol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2,4-Dichlorophenol					mg/kg	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.16	ND	0.16	ND	0.18	ND	0.18	ND	0.17
2,4-Dimethylphenol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2-Nitrophenol					mg/kg	ND	0.42	ND	0.44	ND	0.39	ND	0.38	ND	0.38	ND	0.39	ND	0.42	ND	0.42	ND	0.4
4-Nitrophenol					mg/kg	ND	0.27	ND	0.29	ND	0.25	ND	0.25	ND	0.24	ND	0.25	ND	0.27	ND	0.27	ND	0.26
2,4-Dinitrophenol					mg/kg	ND	0.94	ND	0.98	ND	0.87	ND	0.84	ND	0.83	ND	0.86	ND	0.94	ND	0.94	ND	0.9
4,6-Dinitro-o-cresol					mg/kg	ND	0.51	ND	0.53	ND	0.47	ND	0.46	ND	0.45	ND	0.47	ND	0.51	ND	0.51	ND	0.49
Pentachlorophenol	8.0	2.4	6.7	6.7	mg/kg	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.16	ND	0.16	ND	0.15
Phenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.28	ND	0.3	ND	0.26	ND	0.25	ND	0.25	ND	0.26	ND	0.28	ND	0.28	ND	0.27
2,4,5-Trichlorophenol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Benzoic Acid					mg/kg	ND	0.64	ND	0.66	ND	0.59	ND	0.57	ND	0.56	ND	0.58	ND	0.63	ND	0.63	ND	0.61
Benzyl Alcohol					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	ND	0.2	ND	0.2	ND	0.19
Carbazole					mg/kg	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.17	ND	0.18	0.35	0.2	ND	0.2	ND	0.19
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.029	ND	0.031	ND	0.027	ND	0.026	ND	0.026	ND	0.027	ND	0.029	ND	0.029	ND	0.028

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

Colorable Colo					_	CATION	S-42 (1		S-42 (1		S-42 (2		S-42 (5	/	S-43 SURI		S-43 (3	/	S-43 (· /	S-43 (1	- /	S-43 (10	
SAMPLE DEFINITION SAMPLE PREMINENT TERM 15-14 15-14 15-15 15-14							,_,				,-,-										,,,		11/9/2	
SVOCs by QCOMS			~									-				2-07								
SYOCAMS VISCO RESCO RESCO Results R.L. Resu			SAMP	LE DEPTH																			16-1	
Accompletifience	[01/00 00/140	TIGGO	naga	ppggg							~ ~ ~								~ ~ ~					
Teach-inforchementernes mg/kg ND					CSCO																			RL
Floorantinotoenzeries 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.34 0.05		20	100	100	500											_						_		0.14
Bist2-Poincerethylether		0.00	0.00	4.0		<u> </u>																		0.17
Page		0.33	0.33	1.2	б																	_		0.1
12-Dichlorobenzene						<u> </u>																		0.16
1-3-Dichlorobenzene			400	400	500																			0.17
1.4 1.6 1.8 9.8 13 13 13 13 13 13 13 1					500	<u> </u>																		0.17
13,3*Dehirorbenzidine 10,0*Dehirorbenzidine 10,0					280	0 0																_		0.17
2,4-Dinitrolulene	,	1.8	9.8	13	130	U U																_		0.17
2.6-Dinitrolotuene						0 0																_		0.17
Fluoranthene	,					<u> </u>																_		0.17
## Homopheny beny ether	2,6-Dinitrotoluene					0 0																_		0.17
## Description of the control of the		100	100	100	500	mg/kg										0.11						_		0.1
Bist/2-chlorospropylether	4-Chlorophenyl phenyl ether					mg/kg			ND					0.18		0.18	ND					_	ND	0.17
Bis(2-chloroethoxy)methane mg/kg ND 0.18 ND 0.18 ND 0.18 ND 0.19 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND 0.16 ND	4-Bromophenyl phenyl ether					mg/kg																_		0.17
Hexachlorobutadiene	1 12/					mg/kg								0.21										0.21
Hexachlorocyclopentadiene	Bis(2-chloroethoxy)methane					mg/kg										0.19								0.19
Hexachloroethane	Hexachlorobutadiene					mg/kg			ND								ND					0.17	ND	0.17
Sophorone	Hexachlorocyclopentadiene					mg/kg			ND							0.51	ND				ND		ND	0.5
Naphthalene 12 100 100 500 mg/kg ND 0.17 0.044J 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18 0.059J 0.17 ND	Hexachloroethane					mg/kg			ND					0.14			ND							0.14
Nitroberzene mg/kg ND 0.15 ND 0.15 ND 0.15 ND 0.16 ND 0.16 ND 0.16 ND 0.18 ND 0.16 ND ND ND ND ND ND ND N	•					mg/kg																		0.16
NDPAIDPA mg/kg ND 0.14 ND 0.14 ND 0.13 ND 0.14 ND 0.14 ND 0.16 ND 0.14 ND 0.14 ND 0.14 ND 0.16 ND 0.14 ND 0.16 ND 0.14 ND 0.16 ND 0.15 ND 0.16 ND 0.16 ND 0.16 ND 0.16 ND 0.16 ND 0.17 ND 0.17 ND 0.17 ND 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18	<u>'</u>	12	100	100	500	mg/kg			0.044J					0.18			ND				0.059J			0.17
No.						mg/kg			ND															0.16
Bis(2-ethylhexyl)phthalate mg/kg ND 0.17 ND 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18 0.26 0.17 ND ND ND ND ND ND ND N	-					mg/kg																		0.14
Butyl benzyl phthalate mg/kg ND 0.17 ND 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18 0.064J 0.17 ND	n-Nitrosodi-n-propylamine					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2		0.18	ND	0.17	ND	0.17
Di-n-butylphthalate mg/kg ND 0.17 ND 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18 ND 0.17 ND	Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.17	ND	0.17		0.17	ND	0.18		0.18	ND		ND	0.18		_	ND	0.17
Di-n-octylphthalate mg/kg ND 0.17 ND 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18 ND 0.17 ND ND ND ND ND ND ND N	Butyl benzyl phthalate					mg/kg	ND		ND				ND	0.18		0.18	ND				0.064J		ND	0.17
Diethyl phthalate Diet	Di-n-butylphthalate					mg/kg	ND		ND				ND	0.18		0.18	ND		ND		ND		ND	0.17
Dimethyl phthalate Dimethy	Di-n-octylphthalate					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
Benzo(a)anthracene	Diethyl phthalate					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND		ND	0.18	ND	0.17	ND	0.17
Benzo(a)pyrene	Dimethyl phthalate					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
Benzo(b)fluoranthene 1 1 1 5.6 mg/kg ND 0.1 ND 0.1 ND 0.1 ND 0.1 ND 0.1 ND 0.1 ND 0.11 0.045J 0.11 0.1J 0.12 ND 0.11 0.57 0.1 ND Benzo(k)fluoranthene 0.8 1 3.9 56 mg/kg ND 0.1 ND 0.1 ND 0.11 ND 0.11 0.042J 0.12 ND 0.11 0.18 0.1 ND Chrysene 1 1 3.9 56 mg/kg ND 0.1 ND 0.1 ND 0.11 ND 0.11 0.041J 0.11 0.086J 0.12 ND 0.11 0.47 0.1 ND Acenaphthylene 100 100 100 500 mg/kg ND 0.1 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND </td <td>Benzo(a)anthracene</td> <td>1</td> <td>1</td> <td>1</td> <td>5.6</td> <td>mg/kg</td> <td>ND</td> <td>0.1</td> <td>ND</td> <td>0.1</td> <td>ND</td> <td>0.1</td> <td>ND</td> <td>0.11</td> <td>0.041J</td> <td>0.11</td> <td>0.087J</td> <td>0.12</td> <td>ND</td> <td>0.11</td> <td>0.48</td> <td>0.1</td> <td>ND</td> <td>0.1</td>	Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.1	ND	0.1	ND	0.11	0.041J	0.11	0.087J	0.12	ND	0.11	0.48	0.1	ND	0.1
Benzo(k)fluoranthene 0.8 1 3.9 56 mg/kg ND 0.1 ND 0.1 ND 0.11 ND 0.11 0.042J 0.12 ND 0.11 0.18 0.1 ND Chrysene 1 1 3.9 56 mg/kg ND 0.1 ND 0.1 ND 0.11 0.041J 0.11 0.086J 0.12 ND 0.11 0.47 0.1 ND Acenaphthylene 100 100 100 500 mg/kg ND 0.14 ND 0.13 ND 0.14 ND	Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.14	ND	0.14	0.088J	0.16		0.14	0.42	0.14	ND	0.14
Chrysene 1 1 3.9 56 mg/kg ND 0.1 ND 0.1 ND 0.11 0.041J 0.11 0.086J 0.12 ND 0.11 0.47 0.1 ND Acenaphthylene 100 100 100 500 mg/kg ND 0.14 ND 0.13 ND 0.14 ND 0.11 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND 0.11 ND 0.14 ND 0.14 ND 0.14 ND 0.14 ND 0.14	Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.1	ND	0.1	ND	0.1	ND	0.11	0.045J	0.11	0.1J	0.12	ND	0.11	0.57	0.1	ND	0.1
Acenaphthylene 100 100 100 100 500 mg/kg ND 0.14 ND 0.11 ND 0.14 ND Benzo(ghi)perylene 100 100 100 500 mg/kg ND 0.14 ND 0.13 ND 0.14 0.024J 0.14 0.049J 0.16 ND 0.14 0.26 0.14 ND	Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.1	ND	0.1	ND	0.1	ND	0.11	ND	0.11	0.042J	0.12	ND	0.11	0.18	0.1	ND	0.1
Anthracene 100 100 100 100 500 mg/kg ND 0.1 ND 0.1 ND 0.11 ND 0.11 ND 0.12 ND 0.11 0.17 0.1 ND Benzo(ghi)perylene 100 100 100 500 mg/kg ND 0.14 ND 0.13 ND 0.14 0.024J 0.14 0.049J 0.16 ND 0.14 0.26 0.14 ND	Chrysene	1	1	3.9	56	mg/kg	ND	0.1	ND	0.1	ND	0.1	ND	0.11	0.041J	0.11	0.086J	0.12	ND	0.11	0.47	0.1	ND	0.1
Benzo(ghi)perylene 100 100 100 500 mg/kg ND 0.14 ND 0.14 ND 0.13 ND 0.14 0.024J 0.14 0.049J 0.16 ND 0.14 0.26 0.14 ND	Acenaphthylene	100	100	100	500	mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.14	ND	0.14	ND	0.16	ND	0.14	0.038J	0.14	ND	0.14
Benzo(ghi)perylene 100 100 100 500 mg/kg ND 0.14 ND 0.14 ND 0.13 ND 0.14 0.024J 0.14 0.049J 0.16 ND 0.14 0.26 0.14 ND	Anthracene	100	100	100	500	mg/kg	ND	0.1	ND	0.1	ND	0.1	ND	0.11	ND	0.11	ND	0.12	ND	0.11	0.17	0.1	ND	0.1
	Benzo(ghi)perylene	100	100		500		ND	0.14	ND	0.14	ND	0.13	ND	0.14	0.024J	0.14	0.049J	0.16	ND	0.14	0.26	0.14	ND	0.14
Fluorene 30 100 100 500 mg/kg ND 0.17 ND 0.17 ND 0.17 ND 0.18 ND 0.18 ND 0.2 ND 0.18 0.064J 0.17 ND	Fluorene	30	100	100	500	mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	0.064J	0.17	ND	0.17
Phenanthrene 100 100 100 500 mg/kg ND 0.1 ND 0.1 ND 0.1 ND 0.11 0.043J 0.11 0.1J 0.12 ND 0.11 0.77 0.1 ND	Phenanthrene	100	100				ND	0.1	ND	0.1			ND	0.11	0.043J		0.1J		ND			0.1		0.1
Dibenzo(a,h)anthracene 0.33 0.33 0.33 0.36 mg/kg ND 0.1 ND 0.1 ND 0.11 ND 0.11 ND 0.11 ND 0.11 ND 0.11 ND 0.11 ND		0.33																						0.1
Indeno(1,2,3-cd)pyrene 0.5 0.5 0.5 5.6 mg/kg ND 0.14 ND 0.14 ND 0.13 ND 0.14 0.025J 0.14 0.054J 0.16 ND 0.14 0.28 0.14 ND									ND					0.14	0.025J		0.054J						ND	0.14
Pyrene 100 100 100 500 mg/kg ND 0.1 ND 0.1 ND 0.1 ND 0.11 0.072J 0.11 0.16 0.12 ND 0.11 0.81 0.1 ND																								0.1

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LO	CATION	S-42 (13	3-14)	S-42 (1	7-18)	S-42 (2	21-22)	S-42 (5	33-54)	S-43 SUR	FACE	S-43 (3	3-4)	S-43 (8-9)	S-43 (1	3-14)	S-43 (10	6-17)
				SAMPLIN	NG DATE	11/5/2	020	11/5/2	020	11/5/2	2020	11/5/2	2020	11/9/20	020	11/9/20)20	11/9/2	2020	11/9/2	020	11/9/2	2020
				LAB SA	MPLE ID	L204884	49-09	L20488	49-10	L20488	49-11	L20488	349-12	L204935	52-07	L204935	2-08	L20493	52-09	L20493	52-10	L20493	52-11
		SAMP	LE DEPTH	INTERVA	L (FEET)	13-1	4	17-1	18	21-2	22	53-	54	0-1		3-4		8-9)	13-1	14	16-1	17
				SAMP	LE TYPE	SOI	L	SOI	L	SO	IL	SO	IL	SOII	L	SOII	L	SOI	L	SOI	L	SOI	L
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.39	ND	0.39	ND	0.38	ND	0.4	ND	0.41	ND	0.46	ND	0.4	ND	0.4	ND	0.4
4-Chloroaniline					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
2-Nitroaniline					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
3-Nitroaniline					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
4-Nitroaniline					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
Dibenzofuran	7	14	59	350	mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	0.048J	0.17	ND	0.17
2-Methylnaphthalene					mg/kg	ND	0.2	ND	0.2	ND	0.2	ND	0.21	ND	0.22	ND	0.24	ND	0.21	0.022J	0.21	ND	0.21
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
Acetophenone					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
2,4,6-Trichlorophenol					mg/kg	ND	0.1	ND	0.1	ND	0.1	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.1	ND	0.1
p-Chloro-m-cresol					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
2-Chlorophenol					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
2,4-Dichlorophenol					mg/kg	ND	0.15	ND	0.15	ND	0.15	ND	0.16	ND	0.16	ND	0.18	ND	0.16	ND	0.16	ND	0.16
2,4-Dimethylphenol					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
2-Nitrophenol					mg/kg	ND	0.37	ND	0.37	ND	0.36	ND	0.38	ND	0.39	ND	0.43	ND	0.38	ND	0.37	ND	0.37
4-Nitrophenol					mg/kg	ND	0.24	ND	0.24	ND	0.24	ND	0.25	ND	0.25	ND	0.28	ND	0.25	ND	0.24	ND	0.24
2,4-Dinitrophenol					mg/kg	ND	0.82	ND	0.82	ND	0.81	ND	0.85	ND	0.86	ND	0.96	ND	0.85	ND	0.83	ND	0.83
4,6-Dinitro-o-cresol					mg/kg	ND	0.44	ND	0.44	ND	0.44	ND	0.46	ND	0.47	ND	0.52	ND	0.46	ND	0.45	ND	0.45
Pentachlorophenol	8.0	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.14	ND	0.13	ND	0.14	ND	0.14	ND	0.16	ND	0.14	ND	0.14	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.24	ND	0.24	ND	0.24	ND	0.26	ND	0.26	ND	0.29	ND	0.26	ND	0.25	ND	0.25
2,4,5-Trichlorophenol					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
Benzoic Acid					mg/kg	ND	0.55	ND	0.55	ND	0.55	ND	0.57	ND	0.58	ND	0.65	ND	0.57	ND	0.56	ND	0.56
Benzyl Alcohol					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	ND	0.17	ND	0.17
Carbazole					mg/kg	ND	0.17	ND	0.17	ND	0.17	ND	0.18	ND	0.18	ND	0.2	ND	0.18	0.14J	0.17	ND	0.17
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.026	ND	0.026	ND	0.025	ND	0.027	ND	0.027	ND	0.03	ND	0.026	ND	0.026	ND	0.026

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Envrironmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	CATION	S-43 (22	2-23)	S-44 SUI	REACE	S-44 (4	4-5)	S-44 ((7-8)	S-44 (1.	3-14)	S-44 (1	7-18)	S-44 (2	22-23)	S-44 (5	(1-52)	S-45 SUF	RFACE
				SAMPLI		11/9/2		11/9/2		11/9/2		11/9/2	` /	11/9/2		11/9/2	- /	11/9/2	- /	11/16/		11/10/2	
					MPLE ID	L204935		L20493		L20493		L20493		L20493		L20493		L20493		L20507		L2049628	
		SAMPI	E DEPTH	INTERVA		22-2		0-		4-5		7-		13-1		17-1		22-7		51-		0-1	
		0.22			LE TYPE	SOI		SO		SOI		SO		SOI		SOI		SOI		SO		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.14	ND	0.16	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14
1.2.4-Trichlorobenzene		, , , ,			mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.1	ND	0.12	ND	0.12	ND	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1
Bis(2-chloroethyl)ether					mg/kg	ND	0.15	ND	0.18	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.15	ND	0.16	ND	0.15
2-Chloronaphthalene					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
3,3'-Dichlorobenzidine					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2,4-Dinitrotoluene					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2,6-Dinitrotoluene					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Fluoranthene	100	100	100	500	mg/kg	ND	0.1	2.8	0.12	ND	0.12	0.17	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.15	0.1
4-Chlorophenyl phenyl ether					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
4-Bromophenyl phenyl ether					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.21	ND	0.25	ND	0.24	ND	0.23	ND	0.21	ND	0.21	ND	0.2	ND	0.21	ND	0.2
Bis(2-chloroethoxy)methane					mg/kg	ND	0.18	ND	0.22	ND	0.22	ND	0.21	ND	0.19	ND	0.19	ND	0.18	ND	0.19	ND	0.18
Hexachlorobutadiene					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Hexachlorocyclopentadiene					mg/kg	ND	0.49	ND	0.59	ND	0.58	ND	0.56	ND	0.49	ND	0.49	ND	0.49	ND	0.5	ND	0.49
Hexachloroethane					mg/kg	ND	0.14	ND	0.16	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Isophorone					mg/kg	ND	0.15	ND	0.18	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.15	ND	0.16	ND	0.15
Naphthalene	12	100	100	500	mg/kg	ND	0.17	0.06J	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Nitrobenzene					mg/kg	ND	0.15	ND	0.18	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.15	ND	0.16	ND	0.15
NDPA/DPA					mg/kg	ND	0.14	ND	0.16	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14
n-Nitrosodi-n-propylamine					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Butyl benzyl phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Di-n-butylphthalate					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Di-n-octylphthalate					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Diethyl phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Dimethyl phthalate					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND	0.1	2.1	0.12	ND	0.12	0.078J	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.077J	0.1
Benzo(a)pyrene	1	1	1	1	mg/kg	ND	0.14	2.8	0.16	ND	0.16	0.069J	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	0.066J	0.14
Benzo(b)fluoranthene	1	1	1	5.6	mg/kg	ND	0.1	3.4	0.12	ND	0.12	0.086J	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.082J	0.1
Benzo(k)fluoranthene	0.8	1	3.9	56	mg/kg	ND	0.1	1.2	0.12	ND	0.12	0.033J	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.03J	0.1
Chrysene	1	1	3.9	56	mg/kg	ND	0.1	1.8	0.12	ND	0.12	0.078J	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.079J	0.1
Acenaphthylene	100	100	100	500	mg/kg	ND	0.14	0.22	0.16	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Anthracene	100	100	100	500	mg/kg	ND	0.1	0.2	0.12	ND	0.12	ND	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1
Benzo(ghi)perylene	100	100	100	500	mg/kg	ND	0.14	1.4	0.16	ND	0.16	0.046J	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	0.041J	0.14
Fluorene	30	100	100	500	mg/kg	ND	0.17	0.02J	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Phenanthrene	100	100	100	500	mg/kg	ND	0.1	0.25	0.12	ND	0.12	0.12	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.13	0.1
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	mg/kg	ND	0.1	0.4	0.12	ND	0.12	ND	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	mg/kg	ND	0.14	1.8	0.16	ND	0.16	0.048J	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	0.04J	0.14
Pyrene	100	100	100	500	mg/kg	ND	0.1	2.6	0.12	ND	0.12	0.15	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	0.14	0.1

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	CATION	S-43 (2	2-23)	S-44 SUI	RFACE	S-44 (4	4-5)	S-44 ((7-8)	S-44 (13	3-14)	S-44 (1	7-18)	S-44 (2	2-23)	S-44 (5	1-52)	S-45 SUR	RFACE
				SAMPLI	NG DATE	11/9/2	020	11/9/2	2020	11/9/2	020	11/9/2	2020	11/9/20)20	11/9/2	020	11/9/2	2020	11/16/	2020	11/10/2	2020
				LAB SA	MPLE ID	L20493	52-12	L20493	52-01	L20493	52-02	L20493	52-03	L204935	52-04	L20493	52-05	L20493	52-06	L20507	06-02	L2049628	3-16 R1
		SAMP	LE DEPTH	INTERVA	L (FEET)	22-2	3	0-1	1	4-5	;	7-8	8	13-1	4	17-1	8	22-2	23	51-5	52	0-1	
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SO	IL	SOII	L	SOI	L	SOI	L	SOI	L	SOI	L
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.39	ND	0.47	ND	0.46	ND	0.44	ND	0.39	ND	0.39	ND	0.39	ND	0.4	ND	0.39
4-Chloroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2-Nitroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
3-Nitroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
4-Nitroaniline					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Dibenzofuran	7	14	59	350	mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2-Methylnaphthalene					mg/kg	ND	0.21	ND	0.25	ND	0.24	ND	0.23	ND	0.21	ND	0.21	ND	0.2	ND	0.21	ND	0.2
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Acetophenone					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2,4,6-Trichlorophenol					mg/kg	ND	0.1	ND	0.12	ND	0.12	ND	0.12	ND	0.1	ND	0.1	ND	0.1	ND	0.1	ND	0.1
p-Chloro-m-cresol					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2-Chlorophenol					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2,4-Dichlorophenol					mg/kg	ND	0.15	ND	0.18	ND	0.18	ND	0.18	ND	0.16	ND	0.16	ND	0.15	ND	0.16	ND	0.15
2,4-Dimethylphenol					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2-Nitrophenol					mg/kg	ND	0.37	ND	0.44	ND	0.44	ND	0.42	ND	0.37	ND	0.37	ND	0.37	ND	0.38	ND	0.37
4-Nitrophenol					mg/kg	ND	0.24	ND	0.29	ND	0.28	ND	0.27	ND	0.24	ND	0.24	ND	0.24	ND	0.24	ND	0.24
2,4-Dinitrophenol					mg/kg	ND	0.82	ND	0.99	ND	0.97	ND	0.93	ND	0.83	ND	0.83	ND	0.82	ND	0.83	ND	0.82
4,6-Dinitro-o-cresol					mg/kg	ND	0.45	ND	0.53	ND	0.52	ND	0.5	ND	0.45	ND	0.45	ND	0.44	ND	0.45	ND	0.44
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.16	ND	0.16	ND	0.16	ND	0.14	ND	0.14	ND	0.14	ND	0.14	ND	0.14
Phenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.25	ND	0.3	ND	0.29	ND	0.28	ND	0.25	ND	0.25	ND	0.24	ND	0.25	ND	0.24
2,4,5-Trichlorophenol					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Benzoic Acid					mg/kg	ND	0.56	ND	0.67	ND	0.65	ND	0.63	ND	0.56	ND	0.56	ND	0.55	ND	0.56	ND	0.55
Benzyl Alcohol					mg/kg	ND	0.17	ND	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
Carbazole					mg/kg	ND	0.17	0.056J	0.2	ND	0.2	ND	0.19	ND	0.17	ND	0.17	ND	0.17	ND	0.17	ND	0.17
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.026	ND	0.031	ND	0.03	ND	0.029	ND	0.026	ND	0.026	ND	0.026	ND	0.026	ND	0.026

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

					CATION	S-45 (S-45	` /	S-45 (12		S-45 (1		S-45 (2		S-45 (5	
				SAMPLIN		11/10/2		11/10/		11/10/2		11/10/2		11/10/		11/12/2	
					MPLE ID	L20496		L20496		L204962		L20496		L20496		L20502	
		SAMP	LE DEPTH			3-4		8-		12-1		16-1		23-2		52-5	
					LE TYPE	SOI		SO		SOI		SOI		SO		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Acenaphthene	20	100	100	500	mg/kg	ND	0.14	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.15
1,2,4-Trichlorobenzene					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Hexachlorobenzene	0.33	0.33	1.2	6	mg/kg	ND	0.1	ND	0.11	ND	0.11	ND	0.1	ND	0.1	ND	0.11
Bis(2-chloroethyl)ether					mg/kg	ND	0.16	ND	0.17	ND	0.17	ND	0.15	ND	0.15	ND	0.17
2-Chloronaphthalene					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
1,2-Dichlorobenzene	1.1	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
1,3-Dichlorobenzene	2.4	17	49	280	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
1,4-Dichlorobenzene	1.8	9.8	13	130	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
3,3'-Dichlorobenzidine					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2,4-Dinitrotoluene					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2,6-Dinitrotoluene					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Fluoranthene	100	100	100	500	mg/kg	ND	0.1	ND	0.11	ND	0.11	0.027J	0.1	ND	0.1	ND	0.11
4-Chlorophenyl phenyl ether					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
4-Bromophenyl phenyl ether					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Bis(2-chloroisopropyl)ether					mg/kg	ND	0.21	ND	0.23	ND	0.23	ND	0.2	ND	0.2	ND	0.22
Bis(2-chloroethoxy)methane					mg/kg	ND	0.19	ND	0.2	ND	0.2	ND	0.18	ND	0.18	ND	0.2
Hexachlorobutadiene					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Hexachlorocyclopentadiene					mg/kg	ND	0.49	ND	0.54	ND	0.54	ND	0.48	ND	0.48	ND	0.53
Hexachloroethane					mg/kg	ND	0.14	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.15
Isophorone	10	400	400	500	mg/kg	ND	0.16	ND	0.17	ND	0.17	ND	0.15	ND	0.15	ND	0.17
Naphthalene	12	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Nitrobenzene					mg/kg	ND	0.16	ND	0.17	ND	0.17	ND	0.15	ND	0.15	ND	0.17
NDPA/DPA					mg/kg	ND	0.14	ND	0.15	ND	0.15	ND ND	0.14	ND ND	0.14	ND ND	0.15
n-Nitrosodi-n-propylamine					mg/kg	ND	0.17	ND	0.19	ND	0.19		0.17		0.17		0.18
Bis(2-ethylhexyl)phthalate					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Butyl benzyl phthalate					mg/kg	ND	0.17	ND ND	0.19	ND	0.19	ND	0.17	ND ND	0.17	ND	0.18
Di-n-butylphthalate					mg/kg	ND	0.17		0.19	ND	0.19	ND	0.17		0.17	ND	0.18
Di-n-octylphthalate					mg/kg	ND ND	0.17	ND ND	0.19 0.19	ND ND	0.19 0.19	ND ND	0.17 0.17	ND ND	0.17	ND ND	0.18 0.18
Diethyl phthalate					mg/kg	ND ND	0.17 0.17	ND ND	0.19	ND ND	0.19	ND ND	0.17	ND ND	0.17 0.17	ND ND	0.18
Dimethyl phthalate	1	4	- 1	E.C.	mg/kg	ND	0.17	ND		ND ND		ND		ND		ND ND	0.16
Benzo(a)anthracene	1	1	1	5.6	mg/kg	ND ND		ND ND	0.11		0.11	ND ND	0.1 0.14	ND ND	0.1	ND ND	
Benzo(a)pyrene Benzo(b)fluoranthene	1	1	1	F 6	mg/kg	ND ND	0.14 0.1	ND ND	0.15 0.11	ND ND	0.15 0.11	ND ND	0.14	ND ND	0.14 0.1	ND ND	0.15 0.11
Benzo(k)fluoranthene	0.8	1	3.9	5.6	mg/kg mg/kg	ND ND	0.1	ND	0.11	ND ND	0.11	ND	0.1	ND	0.1	ND ND	0.11
	1	1	3.9	56 56	0	ND ND	0.1	ND	0.11	ND ND	0.11	ND	0.1	ND	0.1	ND ND	0.11
Chrysene Acenaphthylene	100	100	100		mg/kg	ND ND	0.14	ND	0.11	ND ND	0.11	ND	0.14	ND ND	0.14	ND ND	0.11
Anthracene	100		100	500 500	mg/kg	ND ND	0.14	ND ND				ND ND	0.14	ND ND	0.14	ND ND	
	100	100 100	100	500	mg/kg	ND ND	0.14	ND ND	0.11	ND	0.11	ND ND	0.14	ND ND		ND ND	0.11
Benzo(ghi)perylene	30	100	100		mg/kg	ND ND	0.14	ND ND	0.15	ND	0.15	ND ND	0.14	ND ND	0.14 0.17	ND ND	0.15
Fluorene	100	100	100	500 500	mg/kg	ND ND	0.17	ND ND	0.19	ND	0.19			ND ND		ND ND	0.18
Phenanthrene Dibenzo(a b)anthracene	0.33		0.33	0.56	mg/kg	ND ND	0.1	ND ND	0.11 0.11	ND ND	0.11	0.021J ND	0.1 0.1	ND ND	0.1	ND ND	0.11 0.11
Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene	0.33	0.33	0.53	5.6	mg/kg	ND ND	0.14	ND ND	0.11	ND ND	0.11	ND ND	0.14	ND ND	0.14	ND ND	0.11
	100	100	100		mg/kg	ND	0.14	ND	0.15	ND ND	0.15	0.025J	0.14	ND ND	0.14	ND ND	0.15
Pyrene	100	100	100	500	mg/kg	IND	U. I	ND	0.11	טאו	U. I I	0.025J	U. I	חאר	U. I	עא ן	U.II

Table 1B Semi-Volatile Organics in Soil 1440-1460 39th Street Brooklyn

				LC	CATION	S-45 (3-4)	S-45 (8-9)	S-45 (12	2-13)	S-45 (1	6-17)	S-45 (2	3-24)	S-45 (5	2-53)
				SAMPLI	NG DATE	11/10/	2020	11/10/2	2020	11/10/2	020	11/10/2	2020	11/10/2	2020	11/12/2	2020
				LAB SA	MPLE ID	L20496	28-17	L20496	28-18	L204962	28-19	L20496	28-20	L20496	28-21	L20502	25-06
		SAMPI	LE DEPTH	INTERVA	L (FEET)	3-4		8-9		12-1		16-1		23-2		52-5	
				SAMP	LE TYPE	SO		SOI		SOI		SOI		SOI		SOI	
SVOCs by GC/MS	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Biphenyl					mg/kg	ND	0.39	ND	0.43	ND	0.43	ND	0.38	ND	0.39	ND	0.42
4-Chloroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2-Nitroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
3-Nitroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
4-Nitroaniline					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Dibenzofuran	7	14	59	350	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2-Methylnaphthalene					mg/kg	ND	0.21	ND	0.23	ND	0.23	ND	0.2	ND	0.2	ND	0.22
1,2,4,5-Tetrachlorobenzene					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Acetophenone					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2,4,6-Trichlorophenol					mg/kg	ND	0.1	ND	0.11	ND	0.11	ND	0.1	ND	0.1	ND	0.11
p-Chloro-m-cresol					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2-Chlorophenol					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2,4-Dichlorophenol					mg/kg	ND	0.16	ND	0.17	ND	0.17	ND	0.15	ND	0.15	ND	0.17
2,4-Dimethylphenol					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2-Nitrophenol					mg/kg	ND	0.37	ND	0.41	ND	0.41	ND	0.36	ND	0.37	ND	0.4
4-Nitrophenol					mg/kg	ND	0.24	ND	0.27	ND	0.26	ND	0.24	ND	0.24	ND	0.26
2,4-Dinitrophenol					mg/kg	ND	0.83	ND	0.91	ND	0.9	ND	0.81	ND	0.81	ND	0.88
4,6-Dinitro-o-cresol					mg/kg	ND	0.45	ND	0.49	ND	0.49	ND	0.44	ND	0.44	ND	0.48
Pentachlorophenol	0.8	2.4	6.7	6.7	mg/kg	ND	0.14	ND	0.15	ND	0.15	ND	0.14	ND	0.14	ND	0.15
Phenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
2-Methylphenol	0.33	100	100	500	mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
3-Methylphenol/4-Methylphenol	0.33	34	100	500	mg/kg	ND	0.25	ND	0.27	ND	0.27	ND	0.24	ND	0.24	ND	0.26
2,4,5-Trichlorophenol					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Benzoic Acid					mg/kg	ND	0.56	ND	0.62	ND	0.61	ND	0.55	ND	0.55	ND	0.6
Benzyl Alcohol					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
Carbazole					mg/kg	ND	0.17	ND	0.19	ND	0.19	ND	0.17	ND	0.17	ND	0.18
1,4-Dioxane	0.1	9.8	13	130	mg/kg	ND	0.026	ND	0.028	ND	0.028	ND	0.025	ND	0.025	ND	0.028

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Envrironmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

						0.22.0	TIPE LOE				• (6.5)	G 22	(12.11)	G 22	(4= 40)	G 22	(22.22)	g 22	(45.46)	G 22 G	TIDE LOE		
					OCATION		URFACE		2 (3-4)		2 (6-7)		(13-14)		(17-18)		(22-23)		(45-46)		URFACE		3 (4-5)
				SAMPLI			10/2020		0/2020		0/2020		0/2020		0/2020		0/2020		17/2020		4/2020		4/2020
		~		LAB SA			9628-01		9628-02		9628-03		9628-04		9628-05		9628-06		1011-03		8489-05		8489-06
		SAMPI	LE DEPTH		()		0-1		3-4		6-7		3-14		7-18		2-23		5-46		0-1		4-5
- · · · ·				SAMP	LE TYPE		OIL	~	OIL		OIL	~	OIL		OIL								
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL																
Delta-BHC	0.04	100	100	500	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000805	ND	0.000782	ND	0.000742	ND	0.000669	ND	0.000692	ND	0.000684	ND	0.000691	ND	0.000816	ND	0.000799
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000805	ND	0.000782	ND	0.000742	ND	0.000669	ND	0.000692	ND	0.000684	ND	0.000691	ND	0.000816	ND	0.000799
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000966	ND	0.000938	ND	0.000891	ND	0.000802	ND	0.000831	ND	0.000821	ND	0.000829	ND	0.000979	ND	0.000959
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
Heptachlor epoxide					mg/kg	ND	0.00362	ND	0.00352	ND	0.00334	ND	0.00301	ND	0.00312	ND	0.00308	ND	0.00311	ND	0.00367	ND	0.0036
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000805	ND	0.000782	ND	0.000742	ND	0.000669	ND	0.000692	ND	0.000684	ND	0.000691	ND	0.000816	ND	0.000799
Endrin aldehyde					mg/kg	ND	0.00241	ND	0.00234	ND	0.00223	ND	0.00201	ND	0.00208	ND	0.00205	ND	0.00207	ND	0.00245	ND	0.0024
Endrin ketone					mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00121	ND	0.00117	ND	0.00111	ND	0.001	ND	0.00104	ND	0.00103	ND	0.00104	ND	0.00122	ND	0.0012
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00362	ND	0.00352	ND	0.00334	ND	0.00301	ND	0.00312	ND	0.00308	ND	0.00311	ND	0.00367	ND	0.0036
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00193	ND	0.00188	ND	0.00178	ND	0.0016	ND	0.00166	ND	0.00164	ND	0.00166	ND	0.00196	ND	0.00192
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000805	ND	0.000782	ND	0.000742	ND	0.000669	ND	0.000692	ND	0.000684	ND	0.000691	ND	0.000816	ND	0.000799
Methoxychlor					mg/kg	ND	0.00362	ND	0.00352	ND	0.00334	ND	0.00301	ND	0.00312	ND	0.00308	ND	0.00311	ND	0.00367	ND	0.0036
Toxaphene					mg/kg	ND	0.0362	ND	0.0352	ND	0.0334	ND	0.0301	ND	0.0312	ND	0.0308	ND	0.0311	ND	0.0367	ND	0.036
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00241	ND	0.00234	ND	0.00223	ND	0.00201	ND	0.00208	ND	0.00205	ND	0.00207	ND	0.00245	ND	0.0024
trans-Chlordane					mg/kg	ND	0.00241	ND	0.00234	ND	0.00223	ND	0.00201	ND	0.00208	ND	0.00205	ND	0.00207	ND	0.00245	ND	0.0024
Chlordane					mg/kg	ND	0.0161	ND	0.0156	ND	0.0148	ND	0.0134	ND	0.0138	ND	0.0137	ND	0.0138	ND	0.0163	ND	0.016

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

				1.0	CATION	C 2	3 (6-7)	£ 33	(13-14)	C 22	(16-17)	£ 33	(22-23)	£ 33	(44-45)	S-34 SI	DEACE	S 3/	1 (4-5)	C 2/	(7-8)	£ 34	(13-14)
				SAMPLI			4/2020		(13-14) 1/2020		(4/2020		2/2020		17/2020	~	/2020		5/2020		/2020		6/2020
				LARSA			4/2020 18489-07		8489-08		4/2020 18489-09		0225-01		1011-02	L2049		,	9113-02		0113-03	, -	9113-04
		SAMDI	E DEPTH				6-7		3-14		6-17		2-23		4-45		-1		1-5 -5		-8		3-14
		DAMI I	E DEI III		LE TYPE		OIL		OIL		OIL		OIL	_	OIL	SC			OIL		OIL		OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	ma/ka	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
Lindane	0.1	0.28	1.3	9.2	ma/ka	ND	0.000801	ND	0.000676	ND	0.000678	ND	0.00076	ND	0.000739	ND	0.000734	ND	0.000738	ND	0.000739	ND	0.000698
Alpha-BHC	0.02	0.20	0.48	3.4	mg/kg	ND	0.000801	ND	0.000676	ND	0.000678	ND	0.00076	ND	0.000739	ND	0.000734	ND	0.000738	ND	0.000739	ND	0.000698
Beta-BHC	0.036	0.007	0.36	3	ma/ka	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
Heptachlor	0.042	0.072	2.1	15	mg/kg	ND	0.000961	ND	0.000811	ND	0.000813	ND	0.000912	ND	0.000886	ND	0.00088	ND	0.000886	ND	0.000887	ND	0.000838
Aldrin	0.005	0.42	0.097	0.68	mg/kg	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
Heptachlor epoxide	0.000	0.0.0	0.00.	0.00	mg/kg	ND	0.0036	ND	0.00304	ND	0.00305	ND	0.00342	ND	0.00332	ND	0.0033	ND	0.00332	ND	0.00333	ND	0.00314
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000801	ND	0.000676	ND	0.000678	ND	0.00076	ND	0.000739	0.011P	0.000734	ND	0.000738	ND	0.000739	ND	0.000698
Endrin aldehvde					ma/ka	ND	0.0024	ND	0.00203	ND	0.00203	ND	0.00228	ND	0.00222	ND	0.0022	ND	0.00221	ND	0.00222	ND	0.0021
Endrin ketone					ma/ka	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.0012	ND	0.00101	ND	0.00102	ND	0.00114	ND	0.00111	ND	0.0011	ND	0.00111	ND	0.00111	ND	0.00105
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	0.014	0.00176	0.00648	0.00177	0.00398	0.00177	0.00424	0.00168
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.0036	ND	0.00304	ND	0.00305	ND	0.00342	ND	0.00332	0.0236P	0.0033	ND	0.00332	0.00279J	0.00333	ND	0.00314
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00192	ND	0.00162	ND	0.00163	ND	0.00182	ND	0.00177	ND	0.00176	ND	0.00177	ND	0.00177	ND	0.00168
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000801	ND	0.000676	ND	0.000678	ND	0.00076	ND	0.000739	ND	0.000734	ND	0.000738	ND	0.000739	ND	0.000698
Methoxychlor					mg/kg	ND	0.0036	ND	0.00304	ND	0.00305	ND	0.00342	ND	0.00332	ND	0.0033	ND	0.00332	ND	0.00333	ND	0.00314
Toxaphene					mg/kg	ND	0.036	ND	0.0304	ND	0.0305	ND	0.0342	ND	0.0332	ND	0.033	ND	0.0332	ND	0.0333	ND	0.0314
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.0024	ND	0.00203	ND	0.00203	ND	0.00228	ND	0.00222	0.00637P	0.0022	0.00501	0.00221	ND	0.00222	ND	0.0021
trans-Chlordane					mg/kg	ND	0.0024	ND	0.00203	ND	0.00203	ND	0.00228	ND	0.00222	0.0037	0.0022	0.00427	0.00221	ND	0.00222	ND	0.0021
Chlordane					mg/kg	ND	0.016	ND	0.0135	ND	0.0136	ND	0.0152	ND	0.0148	ND	0.0147	ND	0.0148	ND	0.0148	ND	0.014

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

				τ.	OCATION	S-34 (19 10)	S 24	(23-24)	S 2/	(49-50)	C 25 (C	URFACE)	6.2	5 (4-5)	C 2	5 (7-8)	C 25	(11-12)	£ 25	(18-19)	C 25	(21-22)
					NG DATE	(/2020		(23-24) 6/2020		17/2020	(5/2020		5/2020		5 (7-8) 5/2020		6/2020		(18-19) 6/2020		6/2020
					MPLE ID	, ,	113-05		9113-06		51011-01		9113-07		9113-08		9113-09		9113-10		9113-11		9113-12
		CAMDI	LE DEPTH				-19		3-24		9-50		0-1		4-5		7-8		1-12		8-19		1-22
		SAMIT	LE DEI III		PLE TYPE	SC			OIL		SOIL		OIL		OIL		OIL		OIL		OIL		OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	ma/ka	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000672	ND	0.00069	ND	0.000731	ND	0.000812	ND	0.000819	ND	0.000708	ND	0.000665	ND	0.000673	ND	0.000668
Alpha-BHC	0.02	0.20	0.48	3.4	mg/kg	ND	0.000672	ND	0.00069	ND	0.000731	ND	0.000812	ND	0.000819	ND	0.000708	ND ND	0.000665	ND	0.000673	ND ND	0.000668
Beta-BHC	0.036	0.007	0.36	3	ma/ka	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
Heptachlor	0.042	0.012	2.1	15	mg/kg	ND	0.000806	ND	0.000828	ND	0.000878	ND	0.000975	ND	0.000982	ND	0.00085	ND	0.000798	ND	0.000807	ND	0.000801
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
Heptachlor epoxide	0.000			0.00	ma/ka	ND	0.00302	ND	0.00311	ND	0.00329	ND	0.00366	ND	0.00368	ND	0.00318	ND	0.00299	ND	0.00303	ND	0.003
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000672	ND	0.00069	ND	0.000731	ND	0.000812	ND	0.000819	ND	0.000708	ND	0.000665	ND	0.000673	ND	0.000668
Endrin aldehyde					mg/kg	ND	0.00202	ND	0.00207	ND	0.00219	ND	0.00244	ND	0.00246	ND	0.00212	ND	0.002	ND	0.00202	ND	0.002
Endrin ketone					mg/kg	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00101	ND	0.00104	ND	0.0011	ND	0.00122	ND	0.00123	ND	0.00106	ND	0.000998	ND	0.00101	ND	0.001
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
4,4'-DDD	0.0033	2.6	13	92	mg/kg	0.000637J	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00302	ND	0.00311	ND	0.00329	ND	0.00366	ND	0.00368	ND	0.00318	ND	0.00299	ND	0.00303	ND	0.003
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00161	ND	0.00166	ND	0.00176	ND	0.00195	ND	0.00196	ND	0.0017	ND	0.0016	ND	0.00161	ND	0.0016
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000672	ND	0.00069	ND	0.000731	ND	0.000812	ND	0.000819	ND	0.000708	ND	0.000665	ND	0.000673	ND	0.000668
Methoxychlor					mg/kg	ND	0.00302	ND	0.00311	ND	0.00329	ND	0.00366	ND	0.00368	ND	0.00318	ND	0.00299	ND	0.00303	ND	0.003
Toxaphene					mg/kg	ND	0.0302	ND	0.0311	ND	0.0329	ND	0.0366	ND	0.0368	ND	0.0318	ND	0.0299	ND	0.0303	ND	0.03
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00202	ND	0.00207	ND	0.00219	ND	0.00244	ND	0.00246	ND	0.00212	ND	0.002	ND	0.00202	ND	0.002
trans-Chlordane					mg/kg	ND	0.00202	ND	0.00207	ND	0.00219	ND	0.00244	ND	0.00246	ND	0.00212	ND	0.002	ND	0.00202	ND	0.002
Chlordane					mg/kg	ND	0.0134	ND	0.0138	ND	0.0146	ND	0.0162	ND	0.0164	ND	0.0142	ND	0.0133	ND	0.0134	ND	0.0134

NOTES

S-32(13-14) - Sample ID(Sample Depth) mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

			LOCATION																				
							(51-52)	~	URFACE	~ -	6 (4-5)		6 (8-9)		(13-14)		(18-19)	~	(22-23)		(53-54)	~	URFACE
				SAMPLI			6/2020		6/2020		/2020		5/2020		6/2020		5/2020		6/2020		6/2020		10/2020
					MPLE ID		0706-04		9113-13		0113-14		9113-15		9113-16		9113-17		9113-18		0706-03		19628-07
		SAMPI	LE DEPTH		()		1-52		0-1		- 5		8-9		3-14		8-19		2-23		3-54		0-1
		•		SAMI	LE TYPE		OIL		OIL	~	OIL	~	OIL	~	OIL	~	OIL	~	OIL	~	OIL		OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000697	ND	0.000668	ND	0.000669	ND	0.000781	ND	0.000669	ND	0.000734	ND	0.00067	ND	0.000679	ND	0.00077
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000697	ND	0.000668	ND	0.000669	ND	0.000781	ND	0.000669	ND	0.000734	ND	0.00067	ND	0.000679	ND	0.00077
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000836	ND	0.000802	ND	0.000803	ND	0.000937	ND	0.000803	ND	0.00088	ND	0.000804	ND	0.000815	ND	0.000924
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
Heptachlor epoxide					mg/kg	ND	0.00314	ND	0.00301	ND	0.00301	ND	0.00352	ND	0.00301	ND	0.0033	ND	0.00302	ND	0.00306	ND	0.00347
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000697	ND	0.000668	ND	0.000669	ND	0.000781	ND	0.000669	ND	0.000734	ND	0.00067	ND	0.000679	ND	0.00077
Endrin aldehyde					mg/kg	ND	0.00209	ND	0.002	ND	0.00201	ND	0.00234	ND	0.00201	ND	0.0022	ND	0.00201	ND	0.00204	ND	0.00231
Endrin ketone					mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	0.00069J	0.00104	ND	0.001	ND	0.001	ND	0.00117	ND	0.001	ND	0.0011	ND	0.001	ND	0.00102	ND	0.00116
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00314	ND	0.00301	ND	0.00301	ND	0.00352	ND	0.00301	ND	0.0033	ND	0.00302	ND	0.00306	ND	0.00347
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00167	ND	0.0016	ND	0.00161	ND	0.00187	ND	0.0016	ND	0.00176	ND	0.00161	ND	0.00163	ND	0.00185
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000697	ND	0.000668	ND	0.000669	ND	0.000781	ND	0.000669	ND	0.000734	ND	0.00067	ND	0.000679	ND	0.00077
Methoxychlor					mg/kg	ND	0.00314	ND	0.00301	ND	0.00301	ND	0.00352	ND	0.00301	ND	0.0033	ND	0.00302	ND	0.00306	ND	0.00347
Toxaphene					mg/kg	ND	0.0314	ND	0.0301	ND	0.0301	ND	0.0352	ND	0.0301	ND	0.033	ND	0.0302	ND	0.0306	ND	0.0347
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00209	ND	0.002	ND	0.00201	ND	0.00234	ND	0.00201	ND	0.0022	ND	0.00201	ND	0.00204	ND	0.00231
trans-Chlordane					mg/kg	ND	0.00209	ND	0.002	ND	0.00201	ND	0.00234	ND	0.00201	ND	0.0022	ND	0.00201	ND	0.00204	ND	0.00231
Chlordane					mg/kg	ND	0.0139	ND	0.0134	ND	0.0134	ND	0.0156	ND	0.0134	ND	0.0147	ND	0.0134	ND	0.0136	ND	0.0154

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

				1.0	CATION	C_3	37 (4-5)	S-3'	7 (8-9)	S_37	7 (12-13)	S-37	(16-17)	S_37	(22-23)	S-37	(50-51)	C-38 C	URFACE	C-39	3 (4-5)	S-3	8 (6-7)
				SAMPLI			10/2020	2	0/2020		10/2020		0/2020		2/2020	~	6/2020		0/2020		0/2020		0/2020
				LAB SA			19628-08		9628-09		49628-10		9628-11		0225-02		0706-01		9628-12		9628-13		9628-14
		SAMPI	E DEPTH		_		4-5		8-9		12-13		6-17		2-23)-51		0-1		I-5		6-7
		5711711	DE DEI III		LE TYPE		SOIL		OIL		SOIL		OIL										
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	ma/ka	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000818	ND	0.000672	ND	0.000646	ND	0.000701	ND	0.000678	ND	0.000721	ND	0.000736	ND	0.000759	ND	0.000672
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000818	ND	0.000672	ND	0.000646	ND	0.000701	ND	0.000678	ND	0.000721	ND	0.000736	ND	0.000759	ND	0.000672
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000981	ND	0.000806	ND	0.000775	ND	0.000841	ND	0.000813	ND	0.000865	ND	0.000884	ND	0.000911	ND	0.000807
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
Heptachlor epoxide					mg/kg	ND	0.00368	ND	0.00302	ND	0.0029	ND	0.00315	ND	0.00305	ND	0.00324	ND	0.00331	ND	0.00342	ND	0.00302
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000818	ND	0.000672	ND	0.000646	ND	0.000701	ND	0.000678	ND	0.000721	ND	0.000736	ND	0.000759	ND	0.000672
Endrin aldehyde					mg/kg	ND	0.00245	ND	0.00202	ND	0.00194	ND	0.0021	ND	0.00203	ND	0.00216	ND	0.00221	ND	0.00228	ND	0.00202
Endrin ketone					mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00123	ND	0.00101	ND	0.000968	ND	0.00105	ND	0.00102	ND	0.00108	ND	0.0011	ND	0.00114	ND	0.00101
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00368	ND	0.00302	ND	0.0029	ND	0.00315	ND	0.00305	ND	0.00324	ND	0.00331	ND	0.00342	ND	0.00302
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00196	ND	0.00161	ND	0.00155	ND	0.00168	ND	0.00163	ND	0.00173	ND	0.00177	ND	0.00182	ND	0.00161
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000818	ND	0.000672	ND	0.000646	ND	0.000701	ND	0.000678	ND	0.000721	ND	0.000736	ND	0.000759	ND	0.000672
Methoxychlor					mg/kg	ND	0.00368	ND	0.00302	ND	0.0029	ND	0.00315	ND	0.00305	ND	0.00324	ND	0.00331	ND	0.00342	ND	0.00302
Toxaphene					mg/kg	ND	0.0368	ND	0.0302	ND	0.029	ND	0.0315	ND	0.0305	ND	0.0324	ND	0.0331	ND	0.0342	ND	0.0302
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00245	ND	0.00202	ND	0.00194	ND	0.0021	ND	0.00203	ND	0.00216	ND	0.00221	ND	0.00228	ND	0.00202
trans-Chlordane					mg/kg	ND	0.00245	ND	0.00202	ND	0.00194	ND	0.0021	ND	0.00203	ND	0.00216	ND	0.00221	ND	0.00228	ND	0.00202
Chlordane					mg/kg	ND	0.0164	ND	0.0134	ND	0.0129	ND	0.014	ND	0.0136	ND	0.0144	ND	0.0147	ND	0.0152	ND	0.0134

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

							,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				·						(a.a.)				/ ·		(10.10)
				~ ~	CATION		(13-14)	S-38 (1	- /		(23-24)		3 (51-52)	S-39 SU			(2-3)		9 (7-8)		(12-13)		(18-19)
				SAMPLI			.0/2020	11/12/			2/2020		12/2020	11/4/			/2020		4/2020		4/2020		5/2020
					MPLE ID		9628-15	L20502			0225-04		50225-05	L2048	489-01		3489-02		8489-03		8489-04		8849-01
		SAMPI	LE DEPTH		,		3-14	16-1			3-24		51-52	0-			-3		7-8		2-13		3-19
				SAMP	LE TYPE	S	OIL	SOI	IL	S	OIL	S	SOIL	SO		SC	OIL	S	OIL	S	OIL	S	OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000686	ND	0.000817	ND	0.000685	ND	0.000689	ND	0.00821	ND	0.000795	ND	0.000709	ND	0.000686	ND	0.000703
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000686	ND	0.000817	ND	0.000685	ND	0.000689	ND	0.00821	ND	0.000795	ND	0.000709	ND	0.000686	ND	0.000703
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000824	ND	0.000981	ND	0.000822	ND	0.000827	ND	0.00986	ND	0.000954	ND	0.00085	ND	0.000824	ND	0.000844
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
Heptachlor epoxide					mg/kg	ND	0.00309	ND	0.00368	ND	0.00308	ND	0.0031	0.0138JP	0.037	ND	0.00358	ND	0.00319	ND	0.00309	ND	0.00316
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000686	ND	0.000817	ND	0.000685	ND	0.000689	ND	0.00821	ND	0.000795	ND	0.000709	ND	0.000686	ND	0.000703
Endrin aldehyde					mg/kg	ND	0.00206	ND	0.00245	ND	0.00205	ND	0.00207	ND	0.0246	ND	0.00238	ND	0.00212	ND	0.00206	ND	0.00211
Endrin ketone					mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00103	ND	0.00122	ND	0.00103	ND	0.00103	ND	0.0123	ND	0.00119	ND	0.00106	ND	0.00103	ND	0.00105
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	0.0388IP	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00309	ND	0.00368	ND	0.00308	ND	0.0031	ND	0.037	0.00452	0.00358	ND	0.00319	ND	0.00309	ND	0.00316
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00165	ND	0.00196	ND	0.00164	ND	0.00165	ND	0.0197	ND	0.00191	ND	0.0017	ND	0.00165	ND	0.00169
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000686	ND	0.000817	ND	0.000685	ND	0.000689	ND	0.00821	ND	0.000795	ND	0.000709	ND	0.000686	ND	0.000703
Methoxychlor					mg/kg	ND	0.00309	ND	0.00368	ND	0.00308	ND	0.0031	ND	0.037	ND	0.00358	ND	0.00319	ND	0.00309	ND	0.00316
Toxaphene					mg/kg	ND	0.0309	ND	0.0368	ND	0.0308	ND	0.031	ND	0.37	ND	0.0358	ND	0.0319	ND	0.0309	ND	0.0316
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00206	ND	0.00245	ND	0.00205	ND	0.00207	0.0168J	0.0246	ND	0.00238	ND	0.00212	ND	0.00206	ND	0.00211
trans-Chlordane					mg/kg	ND	0.00206	0.000935JP	0.00245	ND	0.00205	ND	0.00207	0.0127J	0.0246	ND	0.00238	ND	0.00212	ND	0.00206	ND	0.00211
Chlordane					mg/kg	ND	0.0137	ND	0.0163	ND	0.0137	ND	0.0138	ND	0.164	ND	0.0159	ND	0.0142	ND	0.0137	ND	0.014

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight Detected Above the NVCDEC USCO, DSCO and DDSCO

				Τ.	CATION	C 20	(21.22)	G 20	(42, 42)	C 40 C	UDEACE	C 4) (2.2)	C 40	(7.0)	C 40	(11.12)	C 40	(16.15)	C 40	(22.24)	C 40	(51.53)
					CATION		(21-22)		(42-43)		URFACE		0 (2-3)	S-40	· -/	~	(11-12)	~	(16-17)		(23-24)		(51-52)
				SAMPLI			1/2020		8/2020		1/2020		1/2020		/2020		1/2020		1/2020		1/2020		1/2020
		CARADI	E DEDOM	LAB SA			9859-08		1396-01		9859-01		9859-02		859-03		0859-04		9859-05		9859-06		9859-07
		SAMPI	LE DEPTH		_ (1-22		2-43		0-1		2-3	•	-8		-12		6-17		3-24		1-52
D (1.1.1.00	TIGGO	Page	ppggo	SAMP	LE TYPE		OIL	~ .	OIL		OIL	~	OIL	SO			OIL		OIL		OIL		OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000678	ND	0.000742	ND	0.000786	ND	0.000817	ND	0.000722	ND	0.000692	ND	0.000728	ND	0.000688	ND	0.000698
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000678	ND	0.000742	ND	0.000786	ND	0.000817	ND	0.000722	ND	0.000692	ND	0.000728	ND	0.000688	ND	0.000698
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000814	ND	0.00089	ND	0.000943	ND	0.000981	ND	0.000866	ND	0.00083	ND	0.000873	ND	0.000826	ND	0.000838
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
Heptachlor epoxide					mg/kg	ND	0.00305	ND	0.00334	ND	0.00354	ND	0.00368	ND	0.00325	ND	0.00311	ND	0.00328	ND	0.0031	ND	0.00314
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000678	ND	0.000742	ND	0.000786	ND	0.000817	ND	0.000722	ND	0.000692	ND	0.000728	ND	0.000688	ND	0.000698
Endrin aldehyde					mg/kg	ND	0.00203	ND	0.00222	ND	0.00236	ND	0.00245	ND	0.00216	ND	0.00208	ND	0.00218	ND	0.00206	ND	0.00209
Endrin ketone					mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00102	ND	0.00111	ND	0.00118	ND	0.00123	ND	0.00108	ND	0.00104	ND	0.00109	ND	0.00103	ND	0.00105
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00305	ND	0.00334	ND	0.00354	ND	0.00368	0.00149J	0.00325	ND	0.00311	ND	0.00328	ND	0.0031	ND	0.00314
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00163	ND	0.00178	ND	0.00188	ND	0.00196	ND	0.00173	ND	0.00166	ND	0.00175	ND	0.00165	ND	0.00168
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000678	ND	0.000742	ND	0.000786	ND	0.000817	ND	0.000722	ND	0.000692	ND	0.000728	ND	0.000688	ND	0.000698
Methoxychlor					mg/kg	ND	0.00305	ND	0.00334	ND	0.00354	ND	0.00368	ND	0.00325	ND	0.00311	ND	0.00328	ND	0.0031	ND	0.00314
Toxaphene					mg/kg	ND	0.0305	ND	0.0334	ND	0.0354	ND	0.0368	ND	0.0325	ND	0.0311	ND	0.0328	ND	0.031	ND	0.0314
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00203	ND	0.00222	ND	0.00236	ND	0.00245	ND	0.00216	ND	0.00208	ND	0.00218	ND	0.00206	ND	0.00209
trans-Chlordane					mg/kg	ND	0.00203	ND	0.00222	ND	0.00236	ND	0.00245	ND	0.00216	ND	0.00208	ND	0.00218	ND	0.00206	ND	0.00209
Chlordane					mg/kg	ND	0.0136	ND	0.0148	ND	0.0157	ND	0.0163	ND	0.0144	ND	0.0138	ND	0.0146	ND	0.0138	ND	0.014

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

				1.0	CATION	C /1 C	URFACE	S 41	1 (4-5)	C /	11 (7-8)	S 41	(12-13)	S 11	(17-18)	\$ 41	(21-22)	S 42 S	URFACE	\$ 1	2 (3-4)	S 1'	2 (7-8)
				SAMPLI	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	~ ~	5/2020		5/2020		/5/2020		5/2020		1/2020		1/2020	~ ~	5/2020		5/2020		5/2020
				LAR SA			18849-02		8849-03		18849-04		8849-05		9859-09		9859-10		8849-06		8849-07		8849-08
		SAMPI	E DEPTH				0-1		4-5		7-8		2-13		7-18		1-22		0-1		3-4		7-8
		SAMILI	JE DEI III.		LE TYPE		OIL		OIL		SOIL		OIL	-	OIL								
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	ma/ka	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
Lindane	0.1	0.28	1.3	9.2	ma/ka	ND	0.000768	ND	0.000839	ND	0.000736	ND	0.000671	ND	0.000705	ND	0.000712	ND	0.000773	ND	0.000802	ND	0.00076
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000768	ND	0.000839	ND	0.000736	ND	0.000671	ND	0.000705	ND	0.000712	ND	0.000773	ND	0.000802	ND	0.00076
Beta-BHC	0.036	0.072	0.36	3	ma/ka	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000921	ND	0.00101	ND	0.000883	ND	0.000806	ND	0.000846	ND	0.000855	ND	0.000928	ND	0.000962	ND	0.000912
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
Heptachlor epoxide					mg/kg	ND	0.00345	ND	0.00378	ND	0.00331	ND	0.00302	ND	0.00317	ND	0.00321	ND	0.00348	ND	0.00361	ND	0.00342
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000768	ND	0.000839	ND	0.000736	ND	0.000671	ND	0.000705	ND	0.000712	ND	0.000773	ND	0.000802	ND	0.00076
Endrin aldehyde					mg/kg	ND	0.0023	ND	0.00252	ND	0.00221	ND	0.00201	ND	0.00212	ND	0.00214	ND	0.00232	ND	0.0024	ND	0.00228
Endrin ketone					mg/kg	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00115	ND	0.00126	ND	0.0011	ND	0.00101	ND	0.00106	ND	0.00107	ND	0.00116	ND	0.0012	ND	0.00114
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00345	ND	0.00378	ND	0.00331	ND	0.00302	ND	0.00317	ND	0.00321	ND	0.00348	ND	0.00361	ND	0.00342
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00184	ND	0.00201	ND	0.00177	ND	0.00161	ND	0.00169	ND	0.00171	ND	0.00186	ND	0.00192	ND	0.00182
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000768	ND	0.000839	ND	0.000736	ND	0.000671	ND	0.000705	ND	0.000712	ND	0.000773	ND	0.000802	ND	0.00076
Methoxychlor					mg/kg	ND	0.00345	ND	0.00378	ND	0.00331	ND	0.00302	ND	0.00317	ND	0.00321	ND	0.00348	ND	0.00361	ND	0.00342
Toxaphene					mg/kg	ND	0.0345	ND	0.0378	ND	0.0331	ND	0.0302	ND	0.0317	ND	0.0321	ND	0.0348	ND	0.0361	ND	0.0342
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.0023	ND	0.00252	ND	0.00221	ND	0.00201	ND	0.00212	ND	0.00214	ND	0.00232	ND	0.0024	ND	0.00228
trans-Chlordane					mg/kg	ND	0.0023	ND	0.00252	ND	0.00221	ND	0.00201	ND	0.00212	ND	0.00214	ND	0.00232	ND	0.0024	ND	0.00228
Chlordane					mg/kg	ND	0.0154	ND	0.0168	ND	0.0147	ND	0.0134	ND	0.0141	ND	0.0142	ND	0.0155	ND	0.016	ND	0.0152

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

				Τ.	CATION	C 42	(13-14)	6.42	(17-18)	6.42	(21-22)	C 42	(53-54)	C 42 C	URFACE	C 42	3 (3-4)	6.4	3 (8-9)	6.42	(13-14)	C 42	(16-17)
				SAMPLI			5/2020		5/2020		(21-22) (5/2020		(53-54) 5/2020	2	0/2020		/2020		3 (8-9) 9/2020		9/2020		9/2020
				LAB SA			8849-09		8849-10		5/2020 8849-11		8849-12		9352-07		0352-08		9352-09		9352-10		9352-11
		CAMPI	E DEPTH						7-18										8-9				6-17
		SAMPI	E DEPIH		_ (3-14 OIL		OIL		61-22 OIL		3-54 OIL		OIL		OIL		OIL		3-14 OIL		OIL
Destinides by CC	USCO	RSCO	DDCCO	SAMP	LE TYPE			~				~		~	~						-		
Pesticides by GC		RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	mg/kg	ND ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.000669	ND	0.000683	ND	0.000677	ND	0.000721	ND	0.000717	ND ND	0.000798	ND	0.000685	ND	0.000687	ND	0.000683
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND	0.000669	ND	0.000683	ND	0.000677	ND	0.000721	ND	0.000717	ND	0.000798	ND	0.000685	ND	0.000687	ND	0.000683
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000802	ND	0.00082	ND	0.000813	ND	0.000865	ND	0.00086	ND	0.000957	ND	0.000822	ND	0.000824	ND	0.00082
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
Heptachlor epoxide					mg/kg	ND	0.00301	ND	0.00307	ND	0.00305	ND	0.00324	ND	0.00322	ND	0.00359	ND	0.00308	ND	0.00309	ND	0.00307
Endrin	0.014	2.2	11	89	mg/kg	ND	0.000669	ND	0.000683	ND	0.000677	ND	0.000721	ND	0.000717	ND	0.000798	ND	0.000685	ND	0.000687	ND	0.000683
Endrin aldehyde					mg/kg	ND	0.00201	ND	0.00205	ND	0.00203	ND	0.00216	ND	0.00215	ND	0.00239	ND	0.00205	ND	0.00206	ND	0.00205
Endrin ketone					mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.001	ND	0.00102	ND	0.00102	ND	0.00108	ND	0.00108	ND	0.0012	ND	0.00103	ND	0.00103	ND	0.00102
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00301	ND	0.00307	ND	0.00305	ND	0.00324	ND	0.00322	ND	0.00359	ND	0.00308	ND	0.00309	ND	0.00307
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.0016	ND	0.00164	ND	0.00162	ND	0.00173	ND	0.00172	ND	0.00191	ND	0.00164	ND	0.00165	ND	0.00164
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.000669	ND	0.000683	ND	0.000677	ND	0.000721	ND	0.000717	ND	0.000798	ND	0.000685	ND	0.000687	ND	0.000683
Methoxychlor					mg/kg	ND	0.00301	ND	0.00307	ND	0.00305	ND	0.00324	ND	0.00322	ND	0.00359	ND	0.00308	ND	0.00309	ND	0.00307
Toxaphene					mg/kg	ND	0.0301	ND	0.0307	ND	0.0305	ND	0.0324	ND	0.0322	ND	0.0359	ND	0.0308	ND	0.0309	ND	0.0307
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00201	ND	0.00205	ND	0.00203	ND	0.00216	ND	0.00215	ND	0.00239	ND	0.00205	ND	0.00206	ND	0.00205
trans-Chlordane					mg/kg	ND	0.00201	ND	0.00205	ND	0.00203	ND	0.00216	ND	0.00215	ND	0.00239	ND	0.00205	ND	0.00206	ND	0.00205
Chlordane					mg/kg	ND	0.0134	ND	0.0137	ND	0.0135	ND	0.0144	ND	0.0143	ND	0.016	ND	0.0137	ND	0.0137	ND	0.0137

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

					_			•		1	,			•	,								
					CATION		(22-23)	2 2	URFACE	~ .	4 (4-5)		4 (7-8)		(13-14)	~	(17-18)	~	(22-23)		(51-52)	2 2	URFACE
				SAMPLI			9/2020		9/2020		9/2020		9/2020		9/2020		/2020		9/2020		6/2020		0/2020
				LAB SA			9352-12		9352-01		9352-02		9352-03		9352-04		9352-05		9352-06		0706-02		9628-16
		SAMPI	LE DEPTH		_ (2-23		0-1		4-5		7-8		3-14		7-18		2-23		1-52		0-1
				SAMP	LE TYPE		OIL	~	OIL	~	OIL	~	OIL	~	OIL		OIL	~	OIL		OIL		OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL																
Delta-BHC	0.04	100	100	500	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
Lindane	0.1	0.28	9. 9			ND	0.00067	ND	0.000832	ND	0.000789	ND	0.000783	ND	0.000677	ND	0.000686	ND	0.000662	ND	0.000694	ND	0.000697
Alpha-BHC	0.02	0.097	.097			ND	0.00067	ND	0.000832	ND	0.000789	ND	0.000783	ND	0.000677	ND	0.000686	ND	0.000662	ND	0.000694	ND	0.000697
Beta-BHC	0.036	0.072	0.36	3	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
Heptachlor	0.042	0.42	2.1	15	mg/kg	ND	0.000804	ND	0.000998	ND	0.000947	ND	0.00094	ND	0.000813	ND	0.000823	ND	0.000794	ND	0.000833	ND	0.000836
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
Heptachlor epoxide					mg/kg	ND	0.00302	ND	0.00374	ND	0.00355	ND	0.00352	ND	0.00305	ND	0.00309	ND	0.00298	ND	0.00312	ND	0.00314
Endrin	0.014	2.2	11	89	mg/kg	ND	0.00067	ND	0.000832	ND	0.000789	ND	0.000783	ND	0.000677	ND	0.000686	ND	0.000662	ND	0.000694	ND	0.000697
Endrin aldehyde					mg/kg	ND	0.00201	ND	0.00249	ND	0.00237	ND	0.00235	ND	0.00203	ND	0.00206	ND	0.00198	ND	0.00208	ND	0.00209
Endrin ketone					mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.001	ND	0.00125	ND	0.00118	ND	0.00117	ND	0.00102	ND	0.00103	ND	0.000993	ND	0.00104	ND	0.00104
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00302	ND	0.00374	ND	0.00355	ND	0.00352	ND	0.00305	ND	0.00309	ND	0.00298	ND	0.00312	ND	0.00314
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00161	ND	0.002	ND	0.00189	ND	0.00188	ND	0.00162	ND	0.00165	ND	0.00159	ND	0.00167	ND	0.00167
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.00067	ND	0.000832	ND	0.000789	ND	0.000783	ND	0.000677	ND	0.000686	ND	0.000662	ND	0.000694	ND	0.000697
Methoxychlor					mg/kg	ND	0.00302	ND	0.00374	ND	0.00355	ND	0.00352	ND	0.00305	ND	0.00309	ND	0.00298	ND	0.00312	ND	0.00314
Toxaphene					mg/kg	ND	0.0302	ND	0.0374	ND	0.0355	ND	0.0352	ND	0.0305	ND	0.0309	ND	0.0298	ND	0.0312	ND	0.0314
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00201	ND	0.00249	ND	0.00237	ND	0.00235	ND	0.00203	ND	0.00206	ND	0.00198	ND	0.00208	ND	0.00209
trans-Chlordane					mg/kg	ND	0.00201	ND	0.00249	ND	0.00237	ND	0.00235	ND	0.00203	ND	0.00206	ND	0.00198	ND	0.00208	ND	0.00209
Chlordane					mg/kg	ND	0.0134	ND	0.0166	ND	0.0158	ND	0.0157	ND	0.0135	ND	0.0137	ND	0.0132	ND	0.0139	ND	0.0139

NOTES

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

				LC	CATION	S-4	5 (3-4)	S-4	5 (8-9)	S-45	(12-13)	S-45	(16-17)	S-45	(23-24)	S-45	(52-53)
				SAMPLIN	NG DATE	11/1	0/2020	11/1	0/2020	11/1	10/2020	11/1	0/2020	11/1	10/2020	11/1	2/2020
				LAB SA	MPLE ID	L204	9628-17	L204	9628-18	L204	9628-19	L204	9628-20	L204	9628-21	L205	0225-06
		SAMPL	E DEPTH	INTERVA	L (FEET)		3-4		8-9	1	2-13	1	6-17	2.	3-24	52	2-53
				SAMP	LE TYPE	S	OIL	S	OIL	S	OIL	S	OIL	S	OIL	S	OIL
Pesticides by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Delta-BHC	0.04	100	100	500	mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
Lindane	0.1	0.28	1.3	9.2	mg/kg	ND	0.00068	ND	0.000734	ND	0.000724	ND	0.000668	ND	0.00068	ND	0.000717
Alpha-BHC	0.02	0.097	0.48	3.4	mg/kg	ND ND	0.00068	ND	0.000734	ND	0.000724	ND	0.000668	ND	0.00068	ND	0.000717
Beta-BHC	0.036	0.072 0.36 3 mg/kg					0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
Heptachlor	0.042	2 0.42 2.1 15 mg/kg					0.000816	ND	0.000881	ND	0.000868	ND	0.000802	ND	0.000816	ND	0.00086
Aldrin	0.005	0.019	0.097	0.68	mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
Heptachlor epoxide					mg/kg	ND	0.00306	ND	0.0033	ND	0.00326	ND	0.00301	ND	0.00306	ND	0.00322
Endrin	0.014	2.2	11	89	mg/kg	ND	0.00068	ND	0.000734	ND	0.000724	ND	0.000668	ND	0.00068	ND	0.000717
Endrin aldehyde					mg/kg	ND	0.00204	ND	0.0022	ND	0.00217	ND	0.002	ND	0.00204	ND	0.00215
Endrin ketone					mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
Dieldrin	0.005	0.039	0.2	1.4	mg/kg	ND	0.00102	ND	0.0011	ND	0.00108	ND	0.001	ND	0.00102	ND	0.00108
4,4'-DDE	0.0033	1.8	8.9	62	mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
4,4'-DDD	0.0033	2.6	13	92	mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
4,4'-DDT	0.0033	1.7	7.9	47	mg/kg	ND	0.00306	ND	0.0033	ND	0.00326	ND	0.00301	ND	0.00306	ND	0.00322
Endosulfan I	2.4	4.8	24	200	mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
Endosulfan II	2.4	4.8	24	200	mg/kg	ND	0.00163	ND	0.00176	ND	0.00174	ND	0.0016	ND	0.00163	ND	0.00172
Endosulfan sulfate	2.4	4.8	24	200	mg/kg	ND	0.00068	ND	0.000734	ND	0.000724	ND	0.000668	ND	0.00068	ND	0.000717
Methoxychlor		mg/kg		ND	0.00306	ND	0.0033	ND	0.00326	ND	0.00301	ND	0.00306	ND	0.00322		
Toxaphene		mg/kg			ND	0.0306	ND	0.033	ND	0.0326	ND	0.0301	ND	0.0306	ND	0.0322	
cis-Chlordane	0.094	0.91	4.2	24	mg/kg	ND	0.00204	ND	0.0022	ND	0.00217	ND	0.002	ND	0.00204	ND	0.00215
trans-Chlordane					mg/kg	ND	0.00204	ND	0.0022	ND	0.00217	ND	0.002	ND	0.00204	ND	0.00215
Chlordane					mg/kg	ND	0.0136	ND	0.0147	ND	0.0145	ND	0.0134	ND	0.0136	ND	0.0143

NOTES

S-32(13-14) - Sample ID(Sample Depth)

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

				LC	CATION	S-32 SU	RFACE	S-32	(3-4)	S-32 (6-7)	S-32 (1	3-14)	S-32 (1	17-18)	S-32 (2	2-23)	S-32 (4	15-46)	S-33 SUI	RFACE	S-33 ((4-5)
				SAMPLI	NG DATE	11/10/	/2020	11/10/	2020	11/10/2	2020	11/10/2	2020	11/10/	/2020	11/10/2	2020	11/17/	2020	11/4/2	2020	11/4/2	2020
				LAB SA	MPLE ID	L20496	628-01	L20496	528-02	L20496	28-03	L20496	28-04	L20490	628-05	L20496	28-06	L20510)11-03	L20484	89-05	L20484	489-06
		SAMP	LE DEPTH	INTERVA	L (FEET)	0-	1	3-	4	6-7	7	13-1	4	17-	18	22-2	23	45-	46	0-1	1	4-:	.5
		RSCO RRSCO CSCO Units				SO	IL	SO	IL	SOI	IL .	SOI	L	SO	IL	SOI	L	SO	IL	SO	IL.	SO	IL
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1254	0.1	1	1	1	mg/kg	0.0054J	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388
PCBs, Total	0.1	1	1	1	mg/kg	0.0054J	0.0401	ND	0.0395	ND	0.0356	ND	0.034	ND	0.0336	ND	0.033	ND	0.0361	ND	0.0398	ND	0.0388

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	CATION	S-33 (6	5-7)	S-33 (13-14)	S-33 (1	16-17)	S-33 (2	22-23)	S-33 (4	14-45)	S-34 SUI	RFACE	S-34 ((4-5)	S-34	(7-8)	S-34 (1	3-14)
				SAMPLIN	NG DATE	11/4/20)20	11/4/	/2020	11/4/2	2020	11/12/	/2020	11/17	/2020	11/6/2	2020	11/6/2	2020	11/6/	2020	11/6/2	2020
				LAB SA	MPLE ID	L204848	89-07	L2048	489-08	L20484	489-09	L20502	225-01	L2051	011-02	L20491	13-01	L20491	13-02	L2049	113-03	L20491	113-04
		SAMPI	LE DEPTH	INTERVA	L (FEET)	6-7		13	-14	16-	·17	22-	23	44-	45	0-	1	4-5	5	7-	8	13-1	14
				SAMP	LE TYPE	SOII	L	SC)IL	SO	IL	SO	IL	SO	IL	SO	IL	SOI	IL	SO	IL	SOI	ĪL .
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	ND	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	ND	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	ND	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	ND	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	ND	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	0.0307J	0.0366	0.0289J	0.0381	ND	0.0362	0.0147J	0.0343
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	0.0212J	0.0366	0.00851J	0.0381	ND	0.0362	ND	0.0343
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	ND	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	0.00882J	0.0366	ND	0.0381	ND	0.0362	ND	0.0343
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.04	ND	0.0344	ND	0.0329	ND	0.0382	ND	0.0381	0.0607J	0.0366	0.0374J	0.0381	ND	0.0362	0.0147J	0.0343

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

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USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

				LO	OCATION	S-34 (1	8-19)	S-34 (2	23-24)	S-34 ((49-50)	S-35 (SU	RFACE)	S-35	(4-5)	S-35	(7-8)	S-35 (11-12)	S-35 (18	8-19)	S-35 (2	21-22)
				SAMPLI	NG DATE	11/6/2	2020	11/6/	2020	11/17	7/2020	11/6/	2020	11/6/	2020	11/6/	2020	11/6/	2020	11/6/2	020	11/6/2	2020
				LAB SA	MPLE ID	L20491	13-05	L2049	113-06	L2051	011-01	L2049	113-07	L2049	113-08	L20491	113-09	L2049	113-10	L20491	13-11	L20491	113-12
		SAMPI	LE DEPTH	INTERVA	L (FEET)	18-	19	23-		49	-50	0-		4-	5	7-	8	11-	-12	18-1	19	21-	
	_	SAMPLE TYPE RSCO RRSCO CSCO Units			SO	IL .	SO	IL	SC	OIL	SO	IL	SO	IL	SO	IL	SO	OIL	SOI	L	SO	⁄IL	
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	\mathbf{RL}
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	0.00677J	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	ND	0.0362	ND	0.0338	ND	0.034	ND	0.0342
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0345	ND	0.0351	ND	0.0352	ND	0.0406	ND	0.0397	0.00677J	0.0362	ND	0.0338	ND	0.034	ND	0.0342

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

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RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	CATION	S-35 (5	51-52)	S-36 SUR	RFACE	S-36	(4-5)	S-36	(8-9)	S-36 (13-14)	S-36 (18-19)	S-36 (2	2-23)	S-36 (5	53-54)	S-37 SUI	RFACE
				SAMPLI	NG DATE	11/16/	2020	11/6/2	020	11/6/	/2020	11/6/	2020	11/6/	2020	11/6/	2020	11/6/2	2020	11/16/	2020	11/10/	/2020
				LAB SA	MPLE ID	L20507	706-04	L20491	13-13	L2049	113-14	L2049	113-15	L2049	113-16	L2049	113-17	L20491	13-18	L20507	706-03	L20496	528-07
		SAMPI	LE DEPTH	INTERVA	L (FEET)	51-	52	0-1		4	-5	8-	.9	13-	14	18-	-19	22-2	23	53-	54	0-1	1
				SAMP	LE TYPE	SO	IL	SOI	L	SC	OIL	SO	IL	SO	IL	SO	IL	SOI	L	SO	IL	SO	IL
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	\mathbf{RL}	Results	RL	Results	RL	Results	RL
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0348	ND	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0348	0.00895J	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0348	0.00895J	0.035	ND	0.0323	ND	0.0378	ND	0.0335	ND	0.0359	ND	0.033	ND	0.0338	ND	0.0372

NOTES

S-32(13-14) - Sample ID(Sample Depth)

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RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LO	CATION	S-37 ((4-5)	S-37	(8-9)	S-37 ((12-13)	S-37 (16-17)	S-37 (2	22-23)	S-37 (50-51)	S-38 SU	RFACE	S-38 (4-5)	S-38	(6-7)
				SAMPLI	NG DATE	11/10/	2020	11/10	/2020	11/10	0/2020	11/10	/2020	11/12	/2020	11/16	/2020	11/10	/2020	11/10/2	2020	11/10/	/2020
				LAB SA	MPLE ID	L20496	28-08	L2049	628-09	L2049	628-10	L2049	628-11	L20502	225-02	L2050'	706-01	L2049	628-12	L20496	28-13	L20496	528-14
		SAMP	LE DEPTH	INTERVA	L (FEET)	4-:	5	8-	.9	12	-13	16-	-17	22-	-23	50-	51	0-	-1	4-5	i	6-	.7
		SAMPLE TYPE RSCO RRSCO CSCO Units			SO	IL	SO	IL	SC	OIL	SO	IL	SO	IL	SO	IL	SO	IL	SOI	L	SO	IL	
PCBs by GC	USCO	RSCO	RSCO RRSCO CSCO Units		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0409	ND	0.0345	ND	0.0328	ND	0.0347	ND	0.0335	ND	0.0357	ND	0.0369	ND	0.039	ND	0.0346

NOTES

S-32(13-14) - Sample ID(Sample Depth)

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Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	CATION	S-38 (1	3-14)	S-38 (1	16-17)	S-38 ((23-24)	S-38 (51-52)	S-39 SU	RFACE	S-39	(2-3)	S-39	(7-8)	S-39 (1	2-13)	S-39 (1	18-19)
				SAMPLI	NG DATE	11/10/	2020	11/12/	/2020	11/12	2/2020	11/12	/2020	11/4/	2020	11/4/	2020	11/4/2	2020	11/4/2	2020	11/5/2	2020
				LAB SA	MPLE ID	L20496	28-15	L20502	225-03	L2050	225-04	L2050	225-05	L2048	489-01	L2048	489-02	L20484	189-03	L20484	89-04	L20488	849-01
		SAMPI	LE DEPTE	I INTERVA	L (FEET)	13-	14	16-	17	23	-24	51-	52	0-	1	2	-3	7-	8	12-	13	18-	19
		SAMPLE TYPE RSCO RRSCO CSCO Units			SO	IL	SO	IL	SC	OIL	SO	IL	SO	IL	SC	IL	so	IL	SO	IL .	SO	IL	
PCBs by GC	USCO	RSCO RRSCO CSCO Units		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL		
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	ND	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	ND	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	ND	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	ND	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	ND	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	0.0418	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	0.024J	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	ND	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	0.0221J	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0333	ND	0.0402	ND	0.0346	ND	0.0336	0.0879J	0.0418	ND	0.0412	ND	0.0352	ND	0.0342	ND	0.0348

NOTES

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CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO
Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	OCATION	S-39 (2	1-22)	S-39 (4	42-43)	S-40 SU	RFACE	S-40 (2-3)	S-40	(7-8)	S-40 (11-12)	S-40 (1	.6-17)	S-40 (2	23-24)	S-40 (5	51-52)
				SAMPLI	NG DATE	11/11/	2020	11/18	/2020	11/11	/2020	11/11/	2020	11/11	/2020	11/11	/2020	11/11/	2020	11/11/	/2020	11/11/	/2020
				LAB SA	MPLE ID	L20498	59-08	L2051	396-01	L2049	859-01	L20498	59-02	L2049	859-03	L2049	859-04	L20498	859-05	L20498	859-06	L20498	859-07
		SAMPI	LE DEPTH	INTERVA	L (FEET)	21-	22	42-	-43	0-	-1	2-3	3	7-	-8	11-	-12	16-	17	23-	-24	51-	-52
		SAMPLE TYPE RSCO RRSCO CSCO Units			SO	IL.	SO	IL	SO	OIL	SO	L	SO	IL	SO	IL	SO	IL	so	IL	SO	IL	
PCBs by GC	USCO	RSCO	RSCO RRSCO CSCO Units		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0364	ND	0.0391	ND	0.041	ND	0.0355	ND	0.0343	ND	0.0354	ND	0.0339	ND	0.0347

NOTES

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CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	CATION	S-41 SU	RFACE	S-41	(4-5)	S-41 (7	7-8)	S-41 (12-13)	S-41 (1	7-18)	S-41 (2	1-22)	S-42 SUI	RFACE	S-42	(3-4)	S-42 ((7-8)
				SAMPLI	NG DATE	11/5/2	2020	11/5/2	2020	11/5/2	020	11/5/	2020	11/11/2	2020	11/11/2	2020	11/5/2	2020	11/5/2	2020	11/5/2	2020
				LAB SA	MPLE ID	L20488	349-02	L20488	349-03	L204884	49-04	L2048	849-05	L20498	59-09	L20498	59-10	L20488	49-06	L20488	849-07	L20488	349-08
		SAMP	LE DEPTH	INTERVA	L (FEET)	0-	1	4-	5	7-8	3	12	-13	17-1	8	21-2	22	0-1	1	3-	.4	7-8	8
		SAMPLE TYPE			SO	IL	SO	IL	SOI	L	SC	IL	SOI	L	SOI	L	SOI	L	SO	IL	SO	IL	
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0384	ND	0.0401	ND	0.036	ND	0.0352	ND	0.035	ND	0.035	ND	0.0394	ND	0.0402	ND	0.0374

NOTES

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				L	OCATION	S-42 (13-14)	S-42 (17-18)	S-42 (2	21-22)	S-42 (53-54)	S-43 SU	RFACE	S-43	(3-4)	S-43 (8-9)	S-43 (13	3-14)	S-43 (1	16-17)
					NG DATE	11/5/		11/5/	- /	11/5/2		11/5/	/	11/9/		11/9/	(- /	11/9/2	/	11/9/2		11/9/2	
				LAB SA	AMPLE ID	L2048	849-09	L2048	849-10	L20488	849-11	L2048	849-12	L20493	352-07	L20493	352-08	L20493	52-09	L204935	52-10	L20493	352-11
		SAMP	LE DEPTH	INTERV	AL (FEET)	13-	14	17-	-18	21-	22	53-	-54	0-	1	3-	.4	8-9)	13-1	4	16-	·17
	_	SAMPLE TYPE RSCO RRSCO CSCO Units			SO	IL	SO	<u>IL</u>	SO	IL	SO	OIL	SO	IL	SO	IL	SOI	L	SOI	L	SO	/IL	
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	0.00524J	0.035	ND	0.0338
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	ND	0.035	ND	0.0338
PCBs. Total	0.1	1	1	1	ma/ka	ND	0.0334	ND	0.0333	ND	0.0323	ND	0.0358	ND	0.0347	ND	0.0396	ND	0.034	0.00524J	0.035	ND	0.0338

NOTES

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				LO	CATION	S-43 (2	2-23)	S-44 SU	RFACE	S-44	(4-5)	S-44	(7-8)	S-44 (13-14)	S-44 (17-18)	S-44 (2	22-23)	S-44 (5	51-52)	S-45 SU	RFACE
				SAMPLI		11/9/2	- /	11/9/		~	/2020	11/9/	(-/	~ (2020	11/9/	-/	11/9/2	- /	11/16			/2020
					MPLE ID	L20493		L20493			0352-02		352-03	L2049			352-05	L20493			706-02	L20496	
		SAMP	LE DEPTE	I INTERVA	L (FEET)	22-2	23	0-	1	4	l-5	7-	8	13-	14	17	-18	22-	23	51-	52	0-	-1
		SAMPLE TYPE RSCO RRSCO CSCO Units			SO	IL	SO	IL	SC	OIL	SO	IL	SO	IL	SC	IL	SO	IL	so	IL	SO	IL	
PCBs by GC	USCO	RSCO RRSCO CSCO Units		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL		
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344
PCBs, Total	0.1	1	1	1	mg/kg	ND	0.0338	ND	0.0414	ND	0.0395	ND	0.0395	ND	0.0347	ND	0.0352	ND	0.0331	ND	0.0338	ND	0.0344

NOTES

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				LO	CATION	S-45	(3-4)	S-45 (8-9)	S-45 (12-13)	S-45 (1	16-17)	S-45 (2	3-24)	S-45 ((52-53)
				SAMPLIN	NG DATE	11/10/	/2020	11/10/2	2020	11/10	/2020	11/10/	/2020	11/10/	2020	11/12	2/2020
				LAB SA	MPLE ID	L20490	528-17	L20496	28-18	L2049	628-19	L20490	628-20	L20496	28-21	L2050	225-06
		SAMP	LE DEPTH	INTERVA	L (FEET)	3-	4	8-9)	12-	-13	16-	17	23-	24	52	-53
						so	IL	SOI	L	SO	IL	so	IL	SO	IL	SC	OIL
PCBs by GC	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aroclor 1016	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1221	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1232	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1242	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1248	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1254	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1260	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1262	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
Aroclor 1268	0.1	1	1	1	mg/kg	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365
PCBs. Total	0.1	1	1	1	ma/ka	ND	0.0329	ND	0.037	ND	0.0373	ND	0.0334	ND	0.0327	ND	0.0365

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				1.0	CATION	S-32 SUI	PEACE	S-32 ((3-4)	S-32 (6-7)	S-32 (1	3-14)	S-32 (1'	7-18)	S-32 (2	2-23)	S-32 (4	5-46)	S-33 SUI	REACE	S-33 (4	4-5)
				SAMPLI		11/10/		11/10/	()	11/10/2	- /	11/10/2	,	11/10/2	/	11/10/2	/	11/17/	/	11/4/2		11/4/2	,
					MPLE ID	L20496		L20496		L20496		L20496		L204962		L20496		L20510		L20484		L204848	
		SAMP	LE DEPTH	INTERVA	L (FEET)	0-1		3-	4	6-7	7	13-1	14	17-1	8	22-2	23	45-4	46	0-	1	4-5	5
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SOI	L	SOI	L	SOI	L	SO	IL	SO	IL	SOI	L
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	7740	9.66	9240	9.65	11900	8.9	8060	8.1	5100	8.04	4660	8.3	1800	8.32	9370	9.69	12800	9.4
Antimony, Total					mg/kg	9.52	4.83	1.93J	4.82	0.552J	4.45	0.737J	4.05	0.684J	4.02	0.473J	4.15	0.349J	4.16	ND	4.84	ND	4.7
Arsenic, Total	13	16	16	16	mg/kg	8.92	0.966	11.5	0.965	4.26	0.89	3.65	0.81	3.43	0.804	2.96	0.83	2.04	0.832	5.55	0.969	10.6	0.94
Barium, Total	350	350	400	400	mg/kg	57.3	0.966	55.3	0.965	35.8	0.89	58.5	0.81	32.8	0.804	36.6	0.83	10.9	0.832	65.9	0.969	30.7	0.94
Beryllium, Total	7.2	14	72	590	mg/kg	0.261J	0.483	0.579	0.482	0.285J	0.445	0.227J	0.405	0.145J	0.402	0.216J	0.415	ND	0.416	0.3J	0.484	0.385J	0.47
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	4.21	0.966	0.608J	0.965	0.481J	0.89	0.518J	0.81	0.458J	0.804	0.415J	0.83	0.241J	0.832	ND	0.969	ND	0.94
Calcium, Total					mg/kg	10200	9.66	593	9.65	633	8.9	9860	8.1	1160	8.04	1760	8.3	465	8.32	43400	9.69	744	9.4
Chromium, Total	30	36	180	400	mg/kg	25.4	0.966	10	0.965	18.2	0.89	18.3	0.81	20.3	0.804	22.5	0.83	5.81	0.832	14.8	0.969	16.9	0.94
Cobalt, Total					mg/kg	8.22	1.93	4.43	1.93	9.07	1.78	8.37	1.62	11.1	1.61	7.89	1.66	4.9	1.66	8.07	1.94	12.8	1.88
Copper, Total	50	270	270	270	mg/kg	112	0.966	64.8	0.965	21.3	0.89	39.7	0.81	20.4	0.804	15.5	0.83	8.05	0.832	17.3	0.969	12.6	0.94
Cyanide, Total	27	27	27	27	mg/kg	ND	1.2	ND	1.2	ND	1.1	ND	0.99	ND	0.97	ND	1	ND	1.1	ND	1.2	ND	1.2
Iron, Total					mg/kg	116000	48.3	16200	4.82	17400	4.45	15600	4.05	14500	4.02	12600	4.15	5580	4.16	11700	4.84	23100	4.7
Lead, Total	63	400	400	1000	mg/kg	187	4.83	45.3	4.82	8.65	4.45	15.9	4.05	4.16	4.02	7.55	4.15	3.97J	4.16	32.5	4.84	10.2	4.7
Magnesium, Total					mg/kg	4040	9.66	1340	9.65	2870	8.9	4110	8.1	4120	8.04	4170	8.3	5200	8.32	3450	9.69	2240	9.4
Manganese, Total	1600	2000	2000	10000	mg/kg	574	0.966	379	0.965	243	0.89	320	0.81	246	0.804	306	0.83	111	0.832	324	0.969	703	0.94
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	0.828	0.094	0.155	0.081	ND	0.071	ND	0.072	ND	0.075	ND	0.074	ND	0.078	0.311	0.077	ND	0.077
Nickel, Total	30	140	310	310	mg/kg	42	2.41	9.45	2.41	24.9	2.22	34.2	2.02	94.6	2.01	48.6	2.07	49.6	2.08	28	2.42	10.9	2.35
Potassium, Total					mg/kg	1610	241	326	241	649	222	2220	202	1580	201	1480	207	348	208	1040	242	386	235
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.93	ND	1.93	ND	1.78	ND	1.62	ND	1.61	ND	1.66	ND	1.66	1.08J	1.94	2.09	1.88
Silver, Total	2	36	180	1500	mg/kg	ND	0.966	ND	0.965	ND	0.89	ND	0.81	ND	0.804	ND	0.83	ND	0.832	ND	0.969	ND	0.94
Sodium, Total					mg/kg	392	193	153J	193	368	178	549	162	133J	161	252	166	82.3J	166	570	194	501	188
Thallium, Total					mg/kg	ND	1.93	ND	1.93	ND	1.78	ND	1.62	ND	1.61	ND	1.66	ND	1.66	ND	1.94	0.47J	1.88
Vanadium, Total					mg/kg	41	0.966	17.6	0.965	33.3	0.89	28.6	0.81	27.8	0.804	22.5	0.83	9.5	0.832	19.4	0.969	28.4	0.94
Zinc, Total	109	2200	10000	10000	mg/kg	152	4.83	33.1	4.82	35.9	4.45	42.2	4.05	29.8	4.02	33.5	4.15	18.5	4.16	48	4.84	29.2	4.7

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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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RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

lighlight - Detected Above the NYSDEC USCO and RSCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				1.0	CATION	S-33 ((7)	S-33 (1	2 14)	S-33 (1	<i>(</i> 17)	S-33 (2	2 22)	S-33 (44	1 45)	S-34 SUI	PEACE	S-34 ((4.5)	S-34 (7 0)	S-34 (1)	2.14)
				SAMPLI		11/4/2	- /	S-33 (1 11/4/2	- /	11/4/2	/	3-33 (2 11/12/		11/17/2		3-34 SUI 11/6/2		3-34 (11/6/2	/	11/6/2		3-34 (1. 11/6/2	
					MPLE ID	L20484		L20484		L20484		L20502		L20510		L20491		L20491		L20491		L20491	
		SAMP	LE DEPTH			6-7		13-		16-1		22-2		44-4		0-1		4-:		7-8		13-1	
		SAMI .	LE DEI III		LE TYPE	SOI		SO		SOI		SOI		SOI	-	SO		SO		SOI		SOI	
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total	CBCO	Roco	RRBCO	CBCO	mg/kg	11500	9.37	5810	8.07	8000	8.06	2710	8.97	2800	8.73	7600	8.76	5780	8.85	11100	8.66	8320	8.11
Antimony, Total					mg/kg	ND	4.69	ND	4.03	ND	4.03	ND.	4.49	0.611J	4.37	ND	4.38	ND	4.43	ND	4.33	ND	4.05
Arsenic. Total	13	16	16	16	mg/kg	4.91	0.937	8.46	0.807	7.74	0.806	1.9	0.897	2.31	0.873	4.67	0.876	5.49	0.885	6.5	0.866	5.72	0.811
Barium, Total	350	350	400	400	mg/kg	27	0.937	58.8	0.807	76.2	0.806	20.2	0.897	21	0.873	65.4	0.876	72.8	0.885	39.7	0.866	78.8	0.811
Beryllium, Total	7.2	14	72	590	mg/kg	0.262J	0.469	0.266J	0.403	0.467	0.403	0.063J	0.449	ND	0.437	0.158J	0.438	0.15J	0.443	0.312J	0.433	0.081J	0.405
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	ND	0.937	ND	0.807	ND	0.806	0.314J	0.897	0.306J	0.873	ND	0.876	ND	0.885	ND	0.866	ND	0.811
Calcium, Total					mg/kg	2520	9.37	1290	8.07	2440	8.06	748	8.97	588	8.73	114000	87.6	83800	88.5	1310	8.66	1730	8.11
Chromium, Total	30	36	180	400	mg/kg	22.7	0.937	23.9	0.807	21.5	0.806	7.05	0.897	11.4	0.873	11.2	0.876	11.7	0.885	14.8	0.866	23.9	0.811
Cobalt, Total					mg/kg	9.59	1.87	26.3	1.61	11.9	1.61	4.56	1.79	5.31	1.75	3.42	1.75	4.32	1.77	7.67	1.73	14.8	1.62
Copper, Total	50	270	270	270	mg/kg	20	0.937	28.4	0.807	41.8	0.806	9.22	0.897	8.15	0.873	18.1	0.876	21.4	0.885	15.8	0.866	30.8	0.811
Cyanide, Total	27	27	27	27	mg/kg	ND	1.1	ND	1	ND	1	ND	1.1	ND	1.1	0.37J	1.1	0.31J	1.1	ND	1.1	ND	0.99
Iron, Total					mg/kg	18000	4.69	17100	4.03	15700	4.03	7910	4.49	8700	4.37	7680	4.38	10400	4.43	16200	4.33	18900	4.05
Lead, Total	63	400	400	1000	mg/kg	7.84	4.69	6.49	4.03	17.6	4.03	3.12J	4.49	3.03J	4.37	51.8	4.38	73.2	4.43	8.33	4.33	46.7	4.05
Magnesium, Total					mg/kg	3610	9.37	4410	8.07	3770	8.06	2220	8.97	2050	8.73	6520	8.76	4030	8.85	2800	8.66	4950	8.11
Manganese, Total	1600	2000	2000	10000	mg/kg	244	0.937	484	0.807	1200	0.806	215	0.897	210	0.873	170	0.876	192	0.885	384	0.866	258	0.811
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.077	ND	0.066	ND	0.065	ND	0.082	ND	0.079	3.15	0.142	19.9	0.716	ND	0.07	ND	0.066
Nickel, Total	30	140	310	310	mg/kg	26.2	2.34	106	2.02	107	2.02	27.2	2.24	30.1	2.18	6.99	2.19	16.8	2.21	14.6	2.16	76.7	2.03
Potassium, Total					mg/kg	646	234	1270	202	1390	202	412	224	473	218	1440	219	1420	221	851	216	3700	203
Selenium, Total	3.9	36	180	1500	mg/kg	0.75J	1.87	1.03J	1.61	0.419J	1.61	ND	1.79	ND	1.75	1.29J	1.75	1.01J	1.77	0.806J	1.73	0.673J	1.62
Silver, Total	2	36	180	1500	mg/kg	ND	0.937	ND	0.807	ND	0.806	ND	0.897	ND	0.873	ND	0.876	ND	0.885	ND	0.866	ND	0.811
Sodium, Total					mg/kg	435	187	289	161	955	161	155J	179	82.9J	175	922	175	684	177	135J	173	187	162
Thallium, Total					mg/kg	ND	1.87	0.379J	1.61	0.476J	1.61	ND	1.79	ND	1.75	ND	1.75	ND	1.77	ND	1.73	ND	1.62
Vanadium, Total					mg/kg	34	0.937	33.4	0.807	27.7	0.806	10.6	0.897	12.8	0.873	11.8	0.876	13.3	0.885	28.1	0.866	29	0.811
Zinc, Total	109	2200	10000	10000	mg/kg	33.9	4.69	56.2	4.03	56.1	4.03	18.4	4.49	19.8	4.37	68.8	4.38	60.3	4.43	28.8	4.33	48.7	4.05

NOTES

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Highlight - Detected Above the NYSDEC USCO

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				1.0	CATION	S-34 (1	9 10)	S-34 (2	2 24)	S-34 (4	0.50)	S-35 (SUI	DEACE)	S-35 (4	1.5)	S-35 (7.9)	S-35 (1	1 12)	S-35 (1	0 10)	S-35 (2)	1 22)
				SAMPLI		11/6/2	- ' /	11/6/2	/	3-34 (4 11/17/2	/	11/6/2		11/6/20	- /	11/6/2	- /	11/6/2	/	11/6/2	/	11/6/2	
					MPLE ID	L20491		L20491		L20510		L20491		L204911		L20491		L20491		L20491		L20491	
		SAMP	LE DEPTH			18-1		23-2		49-5		0-		4-5		7-8		11-1		18-	_	21-2	
		SAMI	DE DEI III		LE TYPE	SOI	-	SO		SOI		SO		SOII		SOI		SOI		SO		SOI	
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total	6566	11000	111000	0.000	mg/kg	5480	8.01	2840	8.36	2450	8.56	9900	9.35	10300	9.7	5400	8.79	7320	7.83	3010	8.09	5980	8.11
Antimony, Total					mg/kg	ND	4.01	ND	4.18	0.428J	4.28	ND	4.68	ND	4.85	ND	4.4	ND	3.92	ND	4.04	ND	4.06
Arsenic. Total	13	16	16	16	mg/kg	3.28	0.801	2.63	0.836	1.9	0.856	8.06	0.935	6.3	0.97	4.15	0.879	5.01	0.783	2.48	0.809	4.68	0.811
Barium, Total	350	350	400	400	mg/kg	32	0.801	19.3	0.836	12.6	0.856	64.4	0.935	37	0.97	22.5	0.879	34.2	0.783	23.4	0.809	41.7	0.811
Beryllium, Total	7.2	14	72	590	mg/kg	0.16J	0.401	0.117J	0.418	ND	0.428	0.514	0.468	0.534	0.485	0.237J	0.44	0.345J	0.392	0.105J	0.404	0.292J	0.406
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	ND	0.801	ND	0.836	0.214J	0.856	ND	0.935	ND	0.97	ND	0.879	ND	0.783	ND	0.809	ND	0.811
Calcium, Total					mg/kg	1400	8.01	878	8.36	586	8.56	1580	9.35	1020	9.7	650	8.79	1200	7.83	797	8.09	2140	8.11
Chromium, Total	30	36	180	400	mg/kg	14.2	0.801	6.93	0.836	6.89	0.856	13.2	0.935	12	0.97	10.8	0.879	14.4	0.783	9.96	0.809	21.9	0.811
Cobalt, Total					mg/kg	7.69	1.6	4.77	1.67	4.59	1.71	5.57	1.87	4.66	1.94	5.6	1.76	8.56	1.57	5.45	1.62	7.71	1.62
Copper, Total	50	270	270	270	mg/kg	17.7	0.801	9	0.836	6.34	0.856	20.9	0.935	7.99	0.97	14.1	0.879	19.7	0.783	11.4	0.809	42.3	0.811
Cyanide, Total	27	27	27	27	mg/kg	ND	1	ND	1.1	ND	1	ND	1.2	ND	1.1	ND	1	ND	1	ND	1	ND	1
Iron, Total					mg/kg	11700	4.01	8690	4.18	5580	4.28	15600	4.68	14600	4.85	10100	4.4	14000	3.92	7810	4.04	14600	4.06
Lead, Total	63	400	400	1000	mg/kg	6.06	4.01	4.22	4.18	8.63	4.28	66.4	4.68	13.4	4.85	9.08	4.4	16.1	3.92	3.06J	4.04	8.74	4.06
Magnesium, Total					mg/kg	4340	8.01	1800	8.36	4970	8.56	2220	9.35	1680	9.7	2590	8.79	2760	7.83	1800	8.09	3450	8.11
Manganese, Total	1600	2000	2000	10000	mg/kg	240	0.801	125	0.836	143	0.856	290	0.935	234	0.97	262	0.879	497	0.783	182	0.809	376	0.811
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.066	ND	0.068	ND	0.08	0.278	0.078	ND	0.077	ND	0.07	0.072	0.065	ND	0.065	ND	0.065
Nickel, Total	30	140	310	310	mg/kg	48.7	2	31.4	2.09	40.4	2.14	14.4	2.34	9.6	2.42	24.6	2.2	24.3	1.96	31.7	2.02	38.7	2.03
Potassium, Total					mg/kg	1650	200	362	209	564	214	782	234	590	242	579	220	705	196	558	202	1510	203
Selenium, Total	3.9	36	180	1500	mg/kg	0.385J	1.6	0.652J	1.67	ND	1.71	0.645J	1.87	0.757J	1.94	ND	1.76	0.799J	1.57	0.34J	1.62	0.852J	1.62
Silver, Total	2	36	180	1500	mg/kg	ND	0.801	ND	0.836	ND	0.856	ND	0.935	ND	0.97	ND	0.879	ND	0.783	ND	0.809	ND	0.811
Sodium, Total					mg/kg	142J	160	58.2J	167	119J	171	251	187	266	194	105J	176	182	157	87.1J	162	277	162
Thallium, Total					mg/kg	ND	1.6	ND	1.67	ND	1.71	ND	1.87	ND	1.94	ND	1.76	ND	1.57	ND	1.62	ND	1.62
Vanadium, Total					mg/kg	19	0.801	11.8	0.836	8.93	0.856	20.7	0.935	19.5	0.97	17.5	0.879	21.7	0.783	11.2	0.809	24.4	0.811
Zinc, Total	109	2200	10000	10000	mg/kg	28	4.01	17.8	4.18	24	4.28	43.2	4.68	25.1	4.85	25.8	4.4	30	3.92	17.7	4.04	34	4.06

NOTES

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				LC	CATION	S-35 (5	1-52)	S-36 SUF	RFACE	S-36 (4-5)	S-36 (8-9)	S-36 (13	3-14)	S-36 (18	8-19)	S-36 (22	2-23)	S-36 (5	3-54)	S-37 SUR	RFACE
				SAMPLI	NG DATE	11/16/2	2020	11/6/2	2020	11/6/2	020	11/6/2	020	11/6/20	020	11/6/2	020	11/6/2	020	11/16/2	2020	11/10/2	2020
				LAB SA	MPLE ID	L205070	06-04	L20491	13-13	L20491	13-14	L20491	13-15	L204911	3-16	L20491	13-17	L20491	13-18	L20507	06-03	L204962	28-07
		SAMPI	LE DEPTH	INTERVA	L (FEET)	51-5	2	0-1	1	4-5	5	8-9		13-1	4	18-1	9	22-2	23	53-5	54	0-1	i
				SAMP	LE TYPE	SOI	L	SOI	IL	SOI	L	SOI	L	SOII	L	SOI	L	SOI	L	SOI	L	SOI	\mathbf{L}
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	3190	8.43	10200	8.01	3660	7.72	5670	9.15	6630	8.16	2360	8.43	4430	7.84	3970	8.13	10000	9.39
Antimony, Total					mg/kg	ND	4.22	ND	4.01	ND	3.86	ND	4.57	ND	4.08	ND	4.21	ND	3.92	ND	4.06	0.733J	4.7
Arsenic, Total	13	16	16	16	mg/kg	2.15	0.843	7.64	0.801	2.31	0.772	3.35	0.915	6.67	0.816	2.47	0.843	3.7	0.784	2.8	0.813	6.62	0.939
Barium, Total	350	350	400	400	mg/kg	21.3	0.843	60	0.801	17.7	0.772	27.4	0.915	72.3	0.816	15.6	0.843	26.9	0.784	33.8	0.813	59.2	0.939
Beryllium, Total	7.2	14	72	590	mg/kg	0.236J	0.422	0.433	0.401	0.17J	0.386	0.302J	0.457	0.155J	0.408	0.126J	0.421	0.071J	0.392	0.219J	0.406	0.517	0.47
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.304J	0.843	ND	0.801	ND	0.772	ND	0.915	ND	0.816	ND	0.843	ND	0.784	0.406J	0.813	0.498J	0.939
Calcium, Total					mg/kg	1080	8.43	2440	8.01	576	7.72	615	9.15	1340	8.16	680	8.43	2360	7.84	3110	8.13	1910	9.39
Chromium, Total	30	36	180	400	mg/kg	12.8	0.843	16	0.801	5.02	0.772	14.2	0.915	45.3	0.816	5.67	0.843	16.3	0.784	28	0.813	12.4	0.939
Cobalt, Total					mg/kg	7.99	1.69	5.62	1.6	2.56	1.54	6.35	1.83	14.1	1.63	3.94	1.68	8.56	1.57	8.37	1.62	6.96	1.88
Copper, Total	50	270	270	270	mg/kg	11.5	0.843	23.7	0.801	4.5	0.772	19.3	0.915	30.4	0.816	9.35	0.843	37	0.784	16.2	0.813	21.4	0.939
Cyanide, Total	27	27	27	27	mg/kg	ND	1.1	ND	1.1	ND	1	ND	1.2	ND	0.97	ND	1.1	ND	0.94	ND	1	ND	1.2
Iron, Total					mg/kg	8570	4.22	15700	4.01	6400	3.86	10200	4.57	18500	4.08	7170	4.21	11700	3.92	12000	4.06	14000	4.7
Lead, Total	63	400	400	1000	mg/kg	5.91	4.22	54.2	4.01	11.7	3.86	5.91	4.57	9.37	4.08	2.44J	4.21	7.34	3.92	6.24	4.06	68.1	4.7
Magnesium, Total					mg/kg	11400	8.43	2260	8.01	920	7.72	3500	9.15	4260	8.16	1730	8.43	6950	7.84	9380	8.13	1730	9.39
Manganese, Total	1600	2000	2000	10000	mg/kg	144	0.843	332	0.801	142	0.772	344	0.915	330	0.816	190	0.843	201	0.784	225	0.813	241	0.939
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.08	0.177	0.067	ND	0.065	ND	0.075	ND	0.066	ND	0.071	ND	0.065	ND	0.076	0.163	0.079
Nickel, Total	30	140	310	310	mg/kg	98.8	2.11	13.1	2	4.48	1.93	33.4	2.29	66.4	2.04	29.2	2.11	54.2	1.96	75.1	2.03	13.4	2.35
Potassium, Total					mg/kg	906	211	696	200	330	193	1120	229	2180	204	364	211	979	196	1520	203	716	235
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.69	1.13J	1.6	ND	1.54	ND	1.83	0.269J	1.63	ND	1.68	0.376J	1.57	ND	1.62	ND	1.88
Silver, Total	2	36	180	1500	mg/kg	ND	0.843	ND	0.801	ND	0.772	ND	0.915	ND	0.816	ND	0.843	ND	0.784	ND	0.813	ND	0.939
Sodium, Total					mg/kg	336	169	161	160	80.2J	154	103J	183	252	163	63.8J	168	310	157	234	162	940	188
Thallium, Total					mg/kg	ND	1.69	ND	1.6	ND	1.54	ND	1.83	ND	1.63	ND	1.68	ND	1.57	ND	1.62	ND	1.88
Vanadium, Total					mg/kg	13.3	0.843	21.1	0.801	8.32	0.772	18.6	0.915	31.6	0.816	9.65	0.843	25.6	0.784	19.7	0.813	22.3	0.939
Zinc, Total	109	2200	10000	10000	mg/kg	26.7	4.22	48.8	4.01	11.7	3.86	31.4	4.57	39.9	4.08	17.2	4.21	36.9	3.92	28.8	4.06	46.4	4.7

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LO	CATION	S-37 (4	l-5)	S-37 ((8-9)	S-37 (1:	2-13)	S-37 (1	6-17)	S-37 (22	2-23)	S-37 (5	0-51)	S-38 SUI	RFACE	S-38 (4-5)	S-38 ((6-7)
				SAMPLIN	NG DATE	11/10/2	020	11/10/	2020	11/10/2	2020	11/10/2	2020	11/12/2	020	11/16/2	2020	11/10/2	2020	11/10/2	2020	11/10/2	2020
				LAB SA	MPLE ID	L204962	28-08	L20496	28-09	L20496	28-10	L20496	28-11	L205022	25-02	L20507	06-01	L20496	28-12	L20496	28-13	L204962	28-14
		SAMP	LE DEPTH	INTERVA	L (FEET)	4-5		8-9	9	12-1	.3	16-1	7	22-2	3	50-5	51	0-1	1	4-5	5	6-7	7
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SOI	L	SOI	L	SOI	L	SO	IL	SOI	L	SOI	IL.
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	13800	9.45	9120	8.28	7770	8.19	6550	8.62	4510	7.77	6820	8.59	10400	8.84	9990	9.39	9770	8.24
Antimony, Total					mg/kg	0.557J	4.72	0.43J	4.14	ND	4.09	ND	4.31	ND	3.89	0.43J	4.3	0.522J	4.42	0.582J	4.69	ND	4.12
Arsenic, Total	13	16	16	16	mg/kg	6.67	0.945	2.88	0.828	2.88	0.819	2.74	0.862	1.43	0.777	2.8	0.859	5.84	0.884	5.88	0.939	3.58	0.824
Barium, Total	350	350	400	400	mg/kg	34	0.945	122	0.828	52.6	0.819	38.2	0.862	59.8	0.777	49.5	0.859	66.3	0.884	71.1	0.939	33.6	0.824
Beryllium, Total	7.2	14	72	590	mg/kg	0.586	0.472	ND	0.414	0.18J	0.409	0.233J	0.431	ND	0.389	0.103J	0.43	0.442	0.442	0.404J	0.469	0.396J	0.412
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.567J	0.945	0.521J	0.828	0.467J	0.819	0.405J	0.862	0.373J	0.777	0.481J	0.859	0.504J	0.884	0.601J	0.939	0.643J	0.824
Calcium, Total					mg/kg	919	9.45	789	8.28	1670	8.19	6630	8.62	997	7.77	2080	8.59	5580	8.84	4030	9.39	1010	8.24
Chromium, Total	30	36	180	400	mg/kg	16.8	0.945	17.8	0.828	25.4	0.819	21.2	0.862	12.6	0.777	40.2	0.859	13.2	0.884	18.4	0.939	21.4	0.824
Cobalt, Total					mg/kg	8.12	1.89	7.86	1.66	10.4	1.64	7.53	1.72	6.71	1.55	9.4	1.72	7.84	1.77	9.43	1.88	10.3	1.65
Copper, Total	50	270	270	270	mg/kg	12.6	0.945	19.8	0.828	15.5	0.819	22	0.862	4.77	0.777	26.6	0.859	18.6	0.884	30.3	0.939	24.2	0.824
Cyanide, Total	27	27	27	27	mg/kg	ND	1.2	ND	1	ND	0.98	ND	1.1	ND	0.97	ND	1	ND	1.1	ND	1.2	ND	1
Iron, Total					mg/kg	20300	4.72	17400	4.14	15400	4.09	12600	4.31	10000	3.89	14900	4.3	15200	4.42	17200	4.69	18700	4.12
Lead, Total	63	400	400	1000	mg/kg	17.1	4.72	3.29J	4.14	5.8	4.09	5.86	4.31	4.75	3.89	7.77	4.3	98.1	4.42	83.7	4.69	6.82	4.12
Magnesium, Total					mg/kg	2580	9.45	4840	8.28	6160	8.19	5320	8.62	3240	7.77	5080	8.59	2290	8.84	3480	9.39	6480	8.24
Manganese, Total	1600	2000	2000	10000	mg/kg	377	0.945	282	0.828	272	0.819	263	0.862	191	0.777	275	0.859	455	0.884	382	0.939	714	0.824
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.096	ND	0.083	ND	0.066	ND	0.075	ND	0.072	ND	0.087	0.089J	0.095	0.098	0.078	ND	0.075
Nickel, Total	30	140	310	310	mg/kg	20.2	2.36	15.4	2.07	37.1	2.05	30.5	2.16	27.7	1.94	56.4	2.15	18.9	2.21	33.6	2.35	41.9	2.06
Potassium, Total					mg/kg	813	236	2980	207	4620	205	2110	216	1990	194	2340	215	852	221	1500	235	1060	206
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.89	ND	1.66	ND	1.64	ND	1.72	ND	1.55	ND	1.72	ND	1.77	ND	1.88	ND	1.65
Silver, Total	2	36	180	1500	mg/kg	ND	0.945	ND	0.828	ND	0.819	ND	0.862	ND	0.777	ND	0.859	ND	0.884	ND	0.939	ND	0.824
Sodium, Total					mg/kg	1730	189	627	166	475	164	662	172	222	155	435	172	774	177	542	188	338	165
Thallium, Total					mg/kg	ND	1.89	ND	1.66	ND	1.64	ND	1.72	ND	1.55	ND	1.72	ND	1.77	ND	1.88	ND	1.65
Vanadium, Total					mg/kg	29.1	0.945	35.7	0.828	48.5	0.819	29.7	0.862	17.2	0.777	29.9	0.859	22.6	0.884	32.7	0.939	41.2	0.824
Zinc, Total	109	2200	10000	10000	mg/kg	33.4	4.72	43.6	4.14	38.5	4.09	33.4	4.31	22.4	3.89	41.7	4.3	69.2	4.42	89.6	4.69	43.9	4.12

NOTES

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Highlight - Detected Above the NYSDEC USCO

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				LO	CATION	S-38 (13	3-14)	S-38 (1	6-17)	S-38 (2	3-24)	S-38 (5	51-52)	S-39 SUF	RFACE	S-39 (2-3)	S-39 (7-8)	S-39 (1	2-13)	S-39 (1	8-19)
				SAMPLIN	NG DATE	11/10/2	2020	11/12/	2020	11/12/2	2020	11/12/	2020	11/4/2	020	11/4/2	020	11/4/2	020	11/4/2	2020	11/5/2	2020
				LAB SA	MPLE ID	L204962	28-15	L20502	25-03	L20502	25-04	L20502	225-05	L20484	89-01	L20484	89-02	L20484	89-03	L20484	89-04	L20488	49-01
		SAMP	LE DEPTH	INTERVA	L (FEET)	13-1	4	16-1	17	23-2	24	51-	52	0-1		2-3	3	7-8	3	12-1	13	18-1	19
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SO	IL	SOI	L	SOI	L	SOI	L	SO	IL	SOI	ıL
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	7100	8.32	5220	9.44	2890	8.06	1900	8.01	6280	9.84	11100	9.66	9580	8.43	7130	8.14	3610	8.22
Antimony, Total					mg/kg	0.474J	4.16	ND	4.72	ND	4.03	ND	4	2.51J	4.92	0.792J	4.83	ND	4.22	ND	4.07	ND	4.11
Arsenic, Total	13	16	16	16	mg/kg	2.9	0.832	1.91	0.944	1.96	0.806	1.06	0.801	20.5	0.984	8.13	0.966	9.58	0.843	5.18	0.814	3.59	0.822
Barium, Total	350	350	400	400	mg/kg	69.7	0.832	37.9	0.944	19.6	0.806	16.5	0.801	397	0.984	47.3	0.966	63	0.843	47.2	0.814	29.6	0.822
Beryllium, Total	7.2	14	72	590	mg/kg	0.133J	0.416	ND	0.472	0.097J	0.403	0.08J	0.4	0.207J	0.492	0.483	0.483	0.295J	0.422	0.179J	0.407	0.345J	0.411
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.474J	0.832	0.444J	0.944	0.354J	0.806	0.256J	0.801	0.984	0.984	ND	0.966	ND	0.843	ND	0.814	0.46J	0.822
Calcium, Total					mg/kg	1420	8.32	2880	9.44	598	8.06	600	8.01	55200	9.84	1150	9.66	1500	8.43	13000	8.14	886	8.22
Chromium, Total	30	36	180	400	mg/kg	19.7	0.832	18.8	0.944	8.92	0.806	6.38	0.801	21.3	0.984	13.3	0.966	26.4	0.843	154	0.814	16.1	0.822
Cobalt, Total					mg/kg	9.29	1.66	6.14	1.89	4.49	1.61	5.74	1.6	15.8	1.97	5.58	1.93	11.2	1.69	7.88	1.63	9.98	1.64
Copper, Total	50	270	270	270	mg/kg	29.3	0.832	18.8	0.944	9.15	0.806	6.97	0.801	92.7	0.984	12.8	0.966	25.2	0.843	29	0.814	12	0.822
Cyanide, Total	27	27	27	27	mg/kg	ND	0.98	ND	1.2	ND	1	ND	1	0.29J	1.2	ND	1.2	ND	0.99	ND	0.98	ND	0.98
Iron, Total					mg/kg	14400	4.16	11500	4.72	8300	4.03	5920	4	41700	4.92	16400	4.83	15500	4.22	14900	4.07	11900	4.11
Lead, Total	63	400	400	1000	mg/kg	7.25	4.16	12.7	4.72	3.26J	4.03	3.27J	4	567	4.92	16.5	4.83	10.4	4.22	14.4	4.07	5.2	4.11
Magnesium, Total					mg/kg	4260	8.32	3500	9.44	2020	8.06	7540	8.01	4240	9.84	1740	9.66	6060	8.43	3950	8.14	9660	8.22
Manganese, Total	1600	2000	2000	10000	mg/kg	353	0.832	234	0.944	232	0.806	153	0.801	249	0.984	261	0.966	330	0.843	296	0.814	327	0.822
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.077	ND	0.087	ND	0.07	ND	0.066	0.65	0.08	ND	0.078	ND	0.068	1.58	0.066	ND	0.079
Nickel, Total	30	140	310	310	mg/kg	59.4	2.08	31.6	2.36	30.4	2.01	77.7	2	26.5	2.46	10.9	2.42	39.8	2.11	35.4	2.04	129	2.06
Potassium, Total					mg/kg	2320	208	1840	236	532	201	456	200	851	246	597	242	3400	211	1530	204	1300	206
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.66	ND	1.89	ND	1.61	ND	1.6	3.55	1.97	0.609J	1.93	1.04J	1.69	1.42J	1.63	0.674J	1.64
Silver, Total	2	36	180	1500	mg/kg	ND	0.832	ND	0.944	ND	0.806	ND	0.801	ND	0.984	ND	0.966	ND	0.843	ND	0.814	ND	0.822
Sodium, Total					mg/kg	224	166	578	189	157J	161	106J	160	544	197	80.1J	193	240	169	673	163	114J	164
Thallium, Total					mg/kg	ND	1.66	ND	1.89	ND	1.61	ND	1.6	ND	1.97	ND	1.93	ND	1.69	ND	1.63	ND	1.64
Vanadium, Total					mg/kg	28.5	0.832	24	0.944	12.4	0.806	7.63	0.801	18.1	0.984	22.6	0.966	38	0.843	31.9	0.814	15.7	0.822
Zinc, Total	109	2200	10000	10000	mg/kg	41.7	4.16	35.2	4.72	19.3	4.03	17.4	4	259	4.92	31.5	4.83	53.8	4.22	36.9	4.07	54.7	4.11

NOTES

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lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	CATION	S-39 (21	-22)	S-39 (4	2-43)	S-40 SUR	RFACE	S-40 ((2-3)	S-40 ('	7-8)	S-40 (1	1-12)	S-40 (1	6-17)	S-40 (2	3-24)	S-40 (5	51-52)
				SAMPLI	IG DATE	11/11/2	020	11/18/2	2020	11/11/2	2020	11/11/	2020	11/11/2	2020	11/11/	2020	11/11/2	2020	11/11/2	2020	11/11/2	/2020
				LAB SA	MPLE ID	L204985	9-08	L20513	96-01	L20498	59-01	L20498	59-02	L20498	59-03	L20498	59-04	L20498	59-05	L20498	59-06	L20498	359-07
		SAMPI	LE DEPTH	INTERVA	L (FEET)	21-22	2	42-4	13	0-1		2-:	3	7-8	1	11-1	12	16-1	17	23-2	24	51-5	52
				SAMP	LE TYPE	SOII	Ĺ	SOI	L	SOI	L	SO	IL	SOI	L	SO	IL	SOI	IL	SOI	L	SOI	ĪL
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	3590	8	2250	8.52	10300	9.36	10000	9.72	12300	8.73	6070	8.23	4380	8.43	12100	8.14	5720	8.25
Antimony, Total					mg/kg	ND	4	ND	4.26	2.36J	4.68	ND	4.86	0.384J	4.36	ND	4.12	ND	4.22	ND	4.07	ND	4.13
Arsenic, Total	13	16	16	16	mg/kg	3.42	8.0	1.78	0.852	15	0.936	4.26	0.972	6.97	0.873	3.11	0.823	2.5	0.843	2.6	0.814	4.21	0.825
Barium, Total	350	350	400	400	mg/kg	28.2	8.0	15.4	0.852	181	0.936	51	0.972	48.9	0.873	41.3	0.823	29.7	0.843	162	0.814	44.8	0.825
Beryllium, Total	7.2	14	72	590	mg/kg	0.224J	0.4	0.119J	0.426	0.571	0.468	0.729	0.486	0.454	0.436	0.329J	0.412	0.253J	0.422	ND	0.407	0.33J	0.413
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.312J	8.0	0.298J	0.852	0.636J	0.936	0.282J	0.972	0.463J	0.873	0.305J	0.823	0.278J	0.843	0.488J	0.814	0.413J	0.825
Calcium, Total					mg/kg	1250	8	756	8.52	27800	9.36	699	9.72	766	8.73	2060	8.23	1080	8.43	2160	8.14	1750	8.25
Chromium, Total	30	36	180	400	mg/kg	16.4	8.0	8.53	0.852	18.1	0.936	10.2	0.972	15.7	0.873	20.4	0.823	18.7	0.843	27.4	0.814	49.2	0.825
Cobalt, Total					mg/kg	11.4	1.6	6.87	1.7	7.9	1.87	4.58	1.94	8.78	1.74	8.42	1.65	8.09	1.69	17.1	1.63	11.1	1.65
Copper, Total	50	270	270	270	mg/kg	12.4	8.0	10.8	0.852	57.4	0.936	5.57	0.972	10.6	0.873	18.1	0.823	17.4	0.843	47.7	0.814	29.1	0.825
Cyanide, Total	27	27	27	27	mg/kg	ND	1	ND	1	ND	1.2	ND	1.2	ND	1	ND	0.99	ND	1	ND	0.96	ND	1
Iron, Total					mg/kg	13000	4	7460	4.26	21800	4.68	13100	4.86	23400	4.36	12100	4.12	10800	4.22	21500	4.07	16400	4.13
Lead, Total	63	400	400	1000	mg/kg	4.52	4	4.95	4.26	1050	4.68	8.57	4.86	8.82	4.36	6.5	4.12	6.29	4.22	11.8	4.07	8.79	4.13
Magnesium, Total					mg/kg	11200	8	11000	8.52	3050	9.36	1420	9.72	2260	8.73	4130	8.23	2950	8.43	8670	8.14	5860	8.25
Manganese, Total	1600	2000	2000	10000	mg/kg	258	8.0	543	0.852	291	0.936	443	0.972	431	0.873	262	0.823	260	0.843	409	0.814	354	0.825
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.07	ND	0.087	0.535	0.084	ND	0.08	ND	0.078	ND	0.066	ND	0.076	ND	0.074	ND	0.069
Nickel, Total	30	140	310	310	mg/kg	126	2	87	2.13	24.3	2.34	9.22	2.43	13	2.18	30	2.06	41.2	2.11	40.6	2.03	54.9	2.06
Potassium, Total					mg/kg	1060	200	611	213	954	234	378	243	494	218	2140	206	1110	211	8220	203	1640	206
Selenium, Total	3.9	36	180	1500	mg/kg	0.712J	1.6	0.281J	1.7	2.52	1.87	1.1J	1.94	2.04	1.74	0.733J	1.65	0.649J	1.69	1.26J	1.63	1.03J	1.65
Silver, Total	2	36	180	1500	mg/kg	ND	8.0	ND	0.852	ND	0.936	ND	0.972	ND	0.873	ND	0.823	ND	0.843	ND	0.814	ND	0.825
Sodium, Total					mg/kg	412	160	93.7J	170	329	187	109J	194	111J	174	239	165	152J	169	453	163	334	165
Thallium, Total					mg/kg	0.368J	1.6	0.401J	1.7	ND	1.87	0.331J	1.94	0.314J	1.74	ND	1.65	ND	1.69	ND	1.63	ND	1.65
Vanadium, Total					mg/kg	20.2	8.0	10.6	0.852	27.3	0.936	17.2	0.972	27.6	0.873	29.9	0.823	19.5	0.843	45.8	0.814	25.2	0.825
Zinc, Total	109	2200	10000	10000	mg/kg	25	4	27.2	4.26	558	4.68	20.1	4.86	28.1	4.36	30.4	4.12	29.6	4.22	64.7	4.07	57.6	4.13

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RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LO	CATION	S-41 SUR	RFACE	S-41 (4-5)	S-41 (7-8)	S-41 (1	2-13)	S-41 (1'	7-18)	S-41 (2	1-22)	S-42 SUR	RFACE	S-42 ((3-4)	S-42 (7-8)
				SAMPLIN	NG DATE	11/5/2	020	11/5/2	020	11/5/2	020	11/5/2	2020	11/11/2	2020	11/11/2	2020	11/5/2	2020	11/5/2	2020	11/5/2	020
				LAB SA	MPLE ID	L20488	49-02	L20488	49-03	L20488	49-04	L20488	49-05	L20498	59-09	L20498	59-10	L20488	49-06	L20488	849-07	L204884	49-08
		SAMP	LE DEPTH	INTERVA	L (FEET)	0-1		4-5	5	7-8	3	12-1	13	17-1	8	21-2	22	0-1	1	3-	4	7-8	;
				SAMP	LE TYPE	SOI	L	SOI	L	SOI	L	SOI	L	SOI	L	SOI	L	SOI	IL	SO	IL	SOI	L
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	9480	9.1	10300	9.83	10300	8.51	5090	8.11	5950	8.29	7250	8.36	9420	9.34	10400	9.14	10900	8.7
Antimony, Total					mg/kg	0.382J	4.55	0.541J	4.92	ND	4.26	ND	4.05	ND	4.14	ND	4.18	2.74J	4.67	ND	4.57	ND	4.35
Arsenic, Total	13	16	16	16	mg/kg	6.14	0.91	8.03	0.983	3.05	0.851	2.39	0.811	4.13	0.829	4.49	0.836	5.92	0.934	8.44	0.914	5.92	0.87
Barium, Total	350	350	400	400	mg/kg	75.1	0.91	60.7	0.983	43.4	0.851	32.6	0.811	50.3	0.829	47.8	0.836	70	0.934	40.1	0.914	26.3	0.87
Beryllium, Total	7.2	14	72	590	mg/kg	0.509	0.455	0.727	0.492	0.528	0.426	0.203J	0.405	0.307J	0.414	0.477	0.418	0.486	0.467	0.594	0.457	0.478	0.435
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.828J	0.91	0.354J	0.983	0.451J	0.851	0.446J	0.811	0.373J	0.829	0.418J	0.836	0.701J	0.934	0.42J	0.914	0.818J	0.87
Calcium, Total					mg/kg	11000	9.1	961	9.83	623	8.51	1400	8.11	1650	8.29	1860	8.36	10800	9.34	949	9.14	980	8.7
Chromium, Total	30	36	180	400	mg/kg	14.7	0.91	10.1	0.983	30.5	0.851	23.9	0.811	18.6	0.829	23.1	0.836	15.7	0.934	13.2	0.914	22.3	0.87
Cobalt, Total					mg/kg	7.35	1.82	4.28	1.97	13	1.7	8.47	1.62	12.5	1.66	12.4	1.67	6.18	1.87	5.9	1.83	8.59	1.74
Copper, Total	50	270	270	270	mg/kg	23	0.91	12.1	0.983	24	0.851	25.3	0.811	29.2	0.829	29.1	0.836	29.6	0.934	15.9	0.914	27	0.87
Cyanide, Total	27	27	27	27	mg/kg	ND	1.1	ND	1.2	ND	1	ND	1	ND	1	ND	1	ND	1.2	ND	1.2	ND	1
Iron, Total					mg/kg	14300	4.55	12700	4.92	15400	4.26	15100	4.05	15600	4.14	15700	4.18	13800	4.67	14600	4.57	28500	4.35
Lead, Total	63	400	400	1000	mg/kg	67.4	4.55	28.3	4.92	6.22	4.26	6.06	4.05	6.45	4.14	12.4	4.18	166	4.67	37.9	4.57	6.17	4.35
Magnesium, Total					mg/kg	2890	9.1	1270	9.83	4180	8.51	2540	8.11	4480	8.29	5560	8.36	2410	9.34	1800	9.14	3560	8.7
Manganese, Total	1600	2000	2000	10000	mg/kg	505	0.91	476	0.983	331	0.851	233	0.811	313	0.829	409	0.836	309	0.934	381	0.914	407	0.87
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	0.13	0.074	0.749	0.09	ND	0.071	ND	0.074	ND	0.069	ND	0.074	0.227	0.081	0.196	0.078	ND	0.077
Nickel, Total	30	140	310	310	mg/kg	22.2	2.27	8.49	2.46	66.4	2.13	49.9	2.03	76.6	2.07	50.8	2.09	19	2.34	11.2	2.28	20.7	2.18
Potassium, Total					mg/kg	953	227	347	246	1520	213	1090	203	1530	207	1680	209	804	234	481	228	791	218
Selenium, Total	3.9	36	180	1500	mg/kg	0.655J	1.82	0.894J	1.97	ND	1.7	ND	1.62	0.937J	1.66	1.01J	1.67	0.57J	1.87	0.42J	1.83	0.418J	1.74
Silver, Total	2	36	180	1500	mg/kg	ND	0.91	ND	0.983	ND	0.851	ND	0.811	ND	0.829	ND	0.836	ND	0.934	ND	0.914	ND	0.87
Sodium, Total					mg/kg	530	182	87.2J	197	57.4J	170	199	162	208	166	391	167	154J	187	33.6J	183	129J	174
Thallium, Total					mg/kg	ND	1.82	ND	1.97	ND	1.7	ND	1.62	ND	1.66	ND	1.67	ND	1.87	ND	1.83	ND	1.74
Vanadium, Total					mg/kg	23.3	0.91	16.5	0.983	28.4	0.851	59.5	0.811	29.2	0.829	33.7	0.836	21.7	0.934	22.1	0.914	39.3	0.87
Zinc, Total	109	2200	10000	10000	mg/kg	142	4.55	28.1	4.92	44.1	4.26	31.1	4.05	52.8	4.14	46.3	4.18	85.9	4.67	36.5	4.57	33	4.35

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

ighlight - Detected Above the NYSDEC USCO and RSCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LO	CATION	S-42 (13	3-14)	S-42 (1	7-18)	S-42 (2	1-22)	S-42 (5	3-54)	S-43 SUR	FACE	S-43 (3-4)	S-43 (8-9)	S-43 (1	3-14)	S-43 (10	6-17)
				SAMPLIN	NG DATE	11/5/2	020	11/5/2	2020	11/5/2	020	11/5/2	020	11/9/2	020	11/9/2	2020	11/9/2	2020	11/9/2	020	11/9/2	2020
				LAB SA	MPLE ID	L204884	49-09	L20488	49-10	L20488	49-11	L20488	49-12	L20493	52-07	L20493	52-08	L20493	52-09	L20493	52-10	L204935	52-11
		SAMP	LE DEPTH	INTERVA	L (FEET)	13-1	4	17-	18	21-2	22	53-5	54	0-1		3-4	1	8-9	9	13-1	14	16-1	17
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SOI	L	SOI	L	SOI	L	SOI	IL	SOI	L	SOI	IL.
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	3280	8.02	7470	7.98	6040	7.97	2970	8.45	9130	8.44	12300	9.43	5290	8.43	5940	8.17	8600	8.34
Antimony, Total					mg/kg	ND	4.01	ND	3.99	ND	3.98	ND	4.22	0.363J	4.22	0.368J	4.72	0.48J	4.21	0.319J	4.09	ND	4.17
Arsenic, Total	13	16	16	16	mg/kg	2.82	0.802	5.32	0.798	2.76	0.797	2.12	0.845	5.06	0.844	5.71	0.943	3.48	0.843	7.27	0.817	4.52	0.834
Barium, Total	350	350	400	400	mg/kg	18.4	0.802	42.3	0.798	52.1	0.797	18.5	0.845	67.2	0.844	38.5	0.943	36.4	0.843	41.2	0.817	74.6	0.834
Beryllium, Total	7.2	14	72	590	mg/kg	0.176J	0.401	0.423	0.399	0.295J	0.398	0.236J	0.422	0.329J	0.422	0.34J	0.472	0.211J	0.421	0.507	0.409	0.35J	0.417
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.321J	0.802	0.478J	0.798	0.382J	0.797	0.287J	0.845	0.506J	0.844	0.528J	0.943	0.303J	0.843	0.498J	0.817	0.601J	0.834
Calcium, Total					mg/kg	636	8.02	1390	7.98	2090	7.97	973	8.45	3180	8.44	1170	9.43	567	8.43	1150	8.17	2730	8.34
Chromium, Total	30	36	180	400	mg/kg	12.8	0.802	34	0.798	23.2	0.797	14.2	0.845	30.6	0.844	18.6	0.943	12.1	0.843	21.2	0.817	32.3	0.834
Cobalt, Total					mg/kg	5.6	1.6	9.44	1.6	9.09	1.59	7.36	1.69	9.38	1.69	9.7	1.89	7.06	1.68	18.7	1.63	18.9	1.67
Copper, Total	50	270	270	270	mg/kg	11.3	0.802	20.4	0.798	22.9	0.797	10	0.845	21.4	0.844	14.7	0.943	14.2	0.843	35.4	0.817	27	0.834
Cyanide, Total	27	27	27	27	mg/kg	ND	0.96	ND	1	0.22J	0.99	0.26J	1.1	ND	1	ND	1.2	ND	1	ND	1	ND	1
Iron, Total					mg/kg	10800	4.01	16600	3.99	13200	3.98	8960	4.22	16700	4.22	18800	4.72	9460	4.21	15300	4.09	18400	4.17
Lead, Total	63	400	400	1000	mg/kg	4.7	4.01	34.2	3.99	6.93	3.98	4.68	4.22	13.5	4.22	11.4	4.72	3.22J	4.21	9.34	4.09	12.6	4.17
Magnesium, Total					mg/kg	1580	8.02	6030	7.98	3660	7.97	11400	8.45	3990	8.44	3280	9.43	2910	8.43	3910	8.17	6740	8.34
Manganese, Total	1600	2000	2000	10000	mg/kg	203	0.802	394	0.798	339	0.797	214	0.845	308	0.844	311	0.943	293	0.843	341	0.817	406	0.834
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.07	ND	0.068	ND	0.068	ND	0.076	0.173	0.087	ND	0.08	ND	0.075	ND	0.073	0.115	0.072
Nickel, Total	30	140	310	310	mg/kg	25	2	48.6	1.99	42.7	1.99	95.8	2.11	75.7	2.11	19.6	2.36	35.3	2.11	70.8	2.04	146	2.09
Potassium, Total					mg/kg	375	200	3340	199	2100	199	804	211	1240	211	832	236	845	211	1480	204	2250	209
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.6	ND	1.6	ND	1.59	ND	1.69	ND	1.69	ND	1.89	ND	1.68	ND	1.63	ND	1.67
Silver, Total	2	36	180	1500	mg/kg	ND	0.802	ND	0.798	ND	0.797	ND	0.845	ND	0.844	ND	0.943	ND	0.843	ND	0.817	ND	0.834
Sodium, Total					mg/kg	20J	160	140J	160	244	159	95.6J	169	220	169	117J	189	85.4J	168	112J	163	251	167
Thallium, Total					mg/kg	ND	1.6	ND	1.6	ND	1.59	ND	1.69	ND	1.69	ND	1.89	ND	1.68	ND	1.63	ND	1.67
Vanadium, Total					mg/kg	18.5	0.802	35.4	0.798	27	0.797	12.6	0.845	27.6	0.844	31.6	0.943	18.2	0.843	30.8	0.817	34.2	0.834
Zinc, Total	109	2200	10000	10000	mg/kg	25.2	4.01	44.5	3.99	32.6	3.98	29.9	4.22	38.8	4.22	34	4.72	31.8	4.21	46.3	4.09	47.2	4.17

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

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USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LC	CATION	S-43 (22	2-23)	S-44 SUI	RFACE	S-44 (4	4-5)	S-44 ((7-8)	S-44 (1.	3-14)	S-44 (1'	7-18)	S-44 (2	2-23)	S-44 (5	1-52)	S-45 SUF	RFACE
				SAMPLI	NG DATE	11/9/2	020	11/9/2	2020	11/9/2	020	11/9/2	2020	11/9/2	020	11/9/2	020	11/9/2	2020	11/16/2	2020	11/10/2	2020
				LAB SA	MPLE ID	L20493	52-12	L20493	52-01	L20493	52-02	L20493	52-03	L20493	52-04	L20493	52-05	L20493	52-06	L20507	06-02	L20496	28-16
		SAMPI	LE DEPTH	INTERVA	L (FEET)	22-2	3	0-1	1	4-5	5	7-8	8	13-1	4	17-1	18	22-2	23	51-5	52	0-1	L
				SAMP	LE TYPE	SOI	L	SO	IL	SOI	L	SOI	IL	SOI	L	SOI	L	SOI	IL	SOI	L	SOI	IL.
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	7190	8.05	7940	9.86	10700	9.68	7580	9.26	5680	8.12	2600	8.18	3090	8.08	4780	8.42	8640	8.14
Antimony, Total					mg/kg	ND	4.03	1.32J	4.93	0.552J	4.84	0.463J	4.63	0.414J	4.06	ND	4.09	ND	4.04	1.07J	4.21	0.342J	4.07
Arsenic, Total	13	16	16	16	mg/kg	4.44	0.805	12.1	0.986	3.93	0.968	4.41	0.926	4.41	0.812	2.19	0.818	2.85	0.808	2.24	0.842	3.59	0.814
Barium, Total	350	350	400	400	mg/kg	57.1	0.805	182	0.986	35	0.968	28.8	0.926	43.9	0.812	18.3	0.818	22.6	0.808	37.3	0.842	40.5	0.814
Beryllium, Total	7.2	14	72	590	mg/kg	0.362J	0.403	0.394J	0.493	0.319J	0.484	0.342J	0.463	0.187J	0.406	0.229J	0.409	0.194J	0.404	0.261J	0.421	0.285J	0.407
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.507J	0.805	7.5	0.986	0.494J	0.968	0.407J	0.926	0.609J	0.812	0.237J	0.818	0.444J	0.808	0.43J	0.842	0.399J	0.814
Calcium, Total					mg/kg	2680	8.05	5930	9.86	822	9.68	835	9.26	1400	8.12	576	8.18	1480	8.08	2260	8.42	2020	8.14
Chromium, Total	30	36	180	400	mg/kg	25	0.805	18.1	0.986	18.3	0.968	12.4	0.926	22.7	0.812	5.79	0.818	12.2	0.808	26.1	0.842	18	0.814
Cobalt, Total					mg/kg	12.2	1.61	4.51	1.97	7.84	1.94	6.7	1.85	21.6	1.62	3.59	1.64	7.28	1.62	7.49	1.68	7.15	1.63
Copper, Total	50	270	270	270	mg/kg	25.1	0.805	62.4	0.986	16.2	0.968	15.3	0.926	24.3	0.812	7.45	0.818	13.2	0.808	24.9	0.842	10.9	0.814
Cyanide, Total	27	27	27	27	mg/kg	ND	0.96	ND	1.2	ND	1.1	ND	1.1	ND	1	ND	1	ND	0.98	ND	1	ND	0.97
Iron, Total					mg/kg	15500	4.03	24500	4.93	18300	4.84	13700	4.63	18400	4.06	7580	4.09	12000	4.04	13000	4.21	13000	4.07
Lead, Total	63	400	400	1000	mg/kg	8.52	4.03	283	4.93	7.48	4.84	13.3	4.63	13.3	4.06	2.28J	4.09	3.26J	4.04	9.15	4.21	8.22	4.07
Magnesium, Total					mg/kg	5680	8.05	2470	9.86	3340	9.68	2550	9.26	21300	8.12	1470	8.18	2580	8.08	4790	8.42	2740	8.14
Manganese, Total	1600	2000	2000	10000	mg/kg	420	0.805	201	0.986	284	0.968	311	0.926	346	0.812	210	0.818	269	0.808	262	0.842	332	0.814
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.077	0.395	0.086	ND	0.097	ND	0.086	ND	0.088	ND	0.085	ND	0.082	ND	80.0	ND	0.066
Nickel, Total	30	140	310	310	mg/kg	92.3	2.01	19.1	2.46	23.9	2.42	27.2	2.31	320	2.03	25.1	2.05	40	2.02	45.1	2.11	19.1	2.04
Potassium, Total					mg/kg	1760	201	794	246	940	242	628	231	1660	203	309	205	723	202	1500	211	972	204
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.61	0.266J	1.97	ND	1.94	ND	1.85	ND	1.62	ND	1.64	ND	1.62	ND	1.68	ND	1.63
Silver, Total	2	36	180	1500	mg/kg	ND	0.805	ND	0.986	ND	0.968	ND	0.926	ND	0.812	ND	0.818	ND	0.808	ND	0.842	ND	0.814
Sodium, Total					mg/kg	182	161	332	197	162J	194	122J	185	229	162	77.2J	164	128J	162	256	168	229	163
Thallium, Total					mg/kg	ND	1.61	ND	1.97	ND	1.94	ND	1.85	ND	1.62	ND	1.64	ND	1.62	ND	1.68	ND	1.63
Vanadium, Total					mg/kg	28.8	0.805	18.8	0.986	30.6	0.968	22	0.926	24	0.812	9.15	0.818	22.1	0.808	23.6	0.842	22.8	0.814
Zinc, Total	109	2200	10000	10000	mg/kg	48.4	4.03	4070	4.93	30	4.84	31.7	4.63	90	4.06	17.1	4.09	28.4	4.04	48.1	4.21	28.3	4.07

NOTES

S-32(13-14) - Sample ID(Sample Depth)

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RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

lighlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

				LO	CATION	S-45 (3-4)	S-45 (8-9)	S-45 (12	2-13)	S-45 (1	6-17)	S-45 (2	3-24)	S-45 (5	2-53)
				SAMPLIN	IG DATE	11/10/2	2020	11/10/2	2020	11/10/2	2020	11/10/2	2020	11/10/2	2020	11/12/2	2020
				LAB SA	MPLE ID	L20496	28-17	L20496	28-18	L204962	28-19	L20496	28-20	L20496	28-21	L20502	25-06
		SAMPI	LE DEPTH	INTERVA	L (FEET)	3-4	1	8-9)	12-1	3	16-1	7	23-2	4	52-5	53
				SAMP	LE TYPE	SOI	L	SOI	L	SOI	L	SOI	L	SOI	L	SOI	L
Total Metals	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Aluminum, Total					mg/kg	7260	7.84	4870	9.26	10500	8.6	6170	8.22	2740	7.9	2280	9.05
Antimony, Total					mg/kg	0.455J	3.92	ND	4.63	0.404J	4.3	ND	4.11	ND	3.95	ND	4.52
Arsenic, Total	13	16	16	16	mg/kg	3.47	0.784	2.63	0.926	5.42	0.86	3.06	0.822	1.34	0.79	2.43	0.905
Barium, Total	350	350	400	400	mg/kg	112	0.784	26.7	0.926	38.4	0.86	39.4	0.822	20.3	0.79	18	0.905
Beryllium, Total	7.2	14	72	590	mg/kg	0.306J	0.392	0.213J	0.463	0.361J	0.43	0.197J	0.411	0.15J	0.395	0.145J	0.452
Cadmium, Total	2.5	2.5	4.3	9.3	mg/kg	0.588J	0.784	0.25J	0.926	0.585J	0.86	0.395J	0.822	0.166J	0.79	0.452J	0.905
Calcium, Total					mg/kg	2460	7.84	587	9.26	5630	8.6	2290	8.22	642	7.9	858	9.05
Chromium, Total	30	36	180	400	mg/kg	19.8	0.784	6.06	0.926	17.6	0.86	23.8	0.822	8.65	0.805	10.1	0.905
Cobalt, Total					mg/kg	9.4	1.57	3.47	1.85	8.3	1.72	6.89	1.64	6.55	1.58	9.17	1.81
Copper, Total	50	270	270	270	mg/kg	47.4	0.784	5.36	0.926	14.8	0.86	13.2	0.822	7.32	0.79	14.7	0.905
Cyanide, Total	27	27	27	27	mg/kg	ND	1	ND	1.1	ND	1	ND	1	ND	0.95	ND	1.1
Iron, Total					mg/kg	17800	3.92	8630	4.63	19600	4.3	12300	4.11	7900	3.95	10400	4.52
Lead, Total	63	400	400	1000	mg/kg	8.54	3.92	12.7	4.63	9.86	4.3	6.7	4.11	2.5J	3.95	5.21	4.52
Magnesium, Total					mg/kg	3870	7.84	1070	9.26	2810	8.6	2920	8.22	6730	7.9	13600	9.05
Manganese, Total	1600	2000	2000	10000	mg/kg	362	0.784	185	0.926	316	0.86	295	0.822	273	0.79	150	0.905
Mercury, Total	0.18	0.81	0.81	2.8	mg/kg	ND	0.075	ND	0.086	ND	0.089	ND	0.074	ND	0.081	ND	0.073
Nickel, Total	30	140	310	310	mg/kg	39.5	1.96	7.8	2.31	20	2.15	24	2.06	62.2	2.01	127	2.26
Potassium, Total					mg/kg	2450	196	520	231	889	215	1140	206	624	198	680	226
Selenium, Total	3.9	36	180	1500	mg/kg	ND	1.57	ND	1.85	ND	1.72	ND	1.64	0.372J	1.58	ND	1.81
Silver, Total	2	36	180	1500	mg/kg	ND	0.784	ND	0.926	ND	0.86	ND	0.822	ND	0.79	ND	0.905
Sodium, Total					mg/kg	246	157	168J	185	254	172	200	164	78.9J	158	143J	181
Thallium, Total					mg/kg	ND	1.57	ND	1.85	ND	1.72	ND	1.64	ND	1.58	ND	1.81
Vanadium, Total					mg/kg	23.7	0.784	15.7	0.926	28.1	0.86	23.1	0.822	10.4	0.79	15.4	0.905
Zinc, Total	109	2200	10000	10000	mg/kg	46.6	3.92	15.3	4.63	33.5	4.3	29.2	4.11	14.4	3.95	37.6	4.52

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Envrironmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

ighlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1F PFAS in Soil 1440-1460 39th Street Brooklyn

																		T			
					OCATION		(13-14)		URFACE		3 (4-5)		3 (6-7)		(13-14)		(16-17)	S-34 SUI		S-35 (1	
				SAMPLI	=		0/2020		4/2020		1/2020		4/2020		1/2020		4/2020	11/6/2		11/6/2	
					MPLE ID		9628-04	L204	8489-05		8489-06		8489-07		8489-08		8489-09	L20491		L20491	
		SAMPL	LE DEPTH		` /		3-14		0-1		4-5		6-7		3-14		6-17	0-1		11-	
				SAMP	LE TYPE		OIL		OIL	S	OIL		OIL		OIL		OIL	SOI		SO	
PFAs by Ispotope Dilution	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL										
Perfluorobutanoic Acid (PFBA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluoropentanoic Acid (PFPeA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorobutanesulfonic Acid (PFBS)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorohexanoic Acid (PFHxA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.000063J	0.00051	0.000051JF	0.000459
Perfluoroheptanoic Acid (PFHpA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorohexanesulfonic Acid (PFHxS	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorooctanoic Acid (PFOA)	0.00066	0.0066	0.033	0.500	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.000283J	0.00051	0.000189J	0.000459
1H,1H,2H,2H-Perfluorooctanesulfonic	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluoroheptanesulfonic Acid (PFHp.	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorononanoic Acid (PFNA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorooctanesulfonic Acid (PFOS)	0.00088	0.0088	0.044	0.440	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.000489J	0.00051	ND	0.000459
Perfluorodecanoic Acid (PFDA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.00009J	0.00051	ND	0.000459
1H,1H,2H,2H-Perfluorodecanesulfonic	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
N-Methyl Perfluorooctanesulfonamido	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.00023J	0.00051	ND	0.000459
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorodecanesulfonic Acid (PFDS)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorooctanesulfonamide (FOSA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
N-Ethyl Perfluorooctanesulfonamidoa	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.000352J	0.00051	ND	0.000459
Perfluorododecanoic Acid (PFDoA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorotridecanoic Acid (PFTrDA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
Perfluorotetradecanoic Acid (PFTA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	ND	0.00051	ND	0.000459
PFOA/PFOS, Total	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000548	ND	0.000543	ND	0.000564	ND	0.000463	ND	0.000458	0.000772J	0.00051	0.000189J	0.000459

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

Table 1F PFAS in Soil 1440-1460 39th Street Brooklyn

				1.0	CATION	S 26 (4.5)	C 27 CIII	DEACE	C 26	3 (4-5)	C 20 CUD	EACE	S-39	(2.2)	C 20	(7.9)	G 20	(12.12)	C 20	(18-19)
					CATION	S-36 (- /	S-37 SUI			(')	S-39 SUR			(- /		(7-8)		(12-13)		(/
				SAMPLIN		11/6/2		11/10/			0/2020	11/4/20		11/4/			/2020		4/2020		5/2020
		CANEDY	E DEDUI	LAB SA		L20491		L20496			0628-13	L204848	59-01	L20484			3489-03		8489-04		8849-01
		SAMPL	LE DEPTH	INTERVA	` /	4-5		0-			1-5	0-1	-	2-			-8		2-13		8-19
DEA L L (D'L ()	TIGGO	Dago	PPGGG	SAMP	LE TYPE	SOI		SO			OIL	SOI		SO			OIL Tr		OIL		OIL
PFAs by Ispotope Dilution	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Perfluorobutanoic Acid (PFBA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	ND	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluoropentanoic Acid (PFPeA)	NC	NC	NC	NC NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000089J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorobutanesulfonic Acid (PFBS)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	ND	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorohexanoic Acid (PFHxA)	NC	NC	NC	NC	mg/kg	ND	0.000476	0.000078J	0.000558	ND	0.000544	0.000119J	0.0006	0.000064J	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluoroheptanoic Acid (PFHpA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000056J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorohexanesulfonic Acid (PFHxS	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	ND	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorooctanoic Acid (PFOA)	0.00066	0.0066	0.033	0.500	mg/kg	0.000067JF	0.000476	0.000088JF	0.000558	ND	0.000544	0.000309J	0.0006	0.000063J	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
1H,1H,2H,2H-Perfluorooctanesulfonic	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	ND	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluoroheptanesulfonic Acid (PFHp.	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	ND	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorononanoic Acid (PFNA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000223J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorooctanesulfonic Acid (PFOS)	0.00088	0.0088	0.044	0.440	mg/kg	ND	0.000476	0.000146J	0.000558	ND	0.000544	0.00868	0.0006	0.00138	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorodecanoic Acid (PFDA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000361J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
1H,1H,2H,2H-Perfluorodecanesulfonio	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	ND	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
N-Methyl Perfluorooctanesulfonamido	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.0036F	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000375J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorodecanesulfonic Acid (PFDS)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.00156	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorooctanesulfonamide (FOSA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.0013F	0.0006	0.000246J	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
N-Ethyl Perfluorooctanesulfonamidoa	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.0165	0.0006	0.000243J	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorododecanoic Acid (PFDoA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000567J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorotridecanoic Acid (PFTrDA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000273J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
Perfluorotetradecanoic Acid (PFTA)	NC	NC	NC	NC	mg/kg	ND	0.000476	ND	0.000558	ND	0.000544	0.000265J	0.0006	ND	0.000564	ND	0.00049	ND	0.000504	ND	0.000474
PFOA/PFOS, Total	NC	NC	NC	NC	mg/kg	0.000067J	0.000476	0.000234J	0.000558	ND	0.000544	0.00899J	0.0006	0.00144J	0.000564	ND	0.00049	ND	0.000504	ND	0.000474

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected RL - Reporting Limit

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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USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective

CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective
Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 1F PFAS in Soil 1440-1460 39th Street Brooklyn

				LC	CATION	S-40	(11-12)	S-41 SUI	RFACE	S-4	2 (3-4)	S-43 S	URFACE	S-44	(7-8)	S-45 (8-9)
				SAMPLI	NG DATE	11/1	1/2020	11/5/2	2020	11/5	5/2020	11/9	9/2020	11/9/	/2020	11/10/2	2020
				LAB SA	MPLE ID	L2049	9859-04	L20488	349-02	L204	8849-07	L204	9352-07	L2049	352-03	L20496	28-18
		SAMPI	LE DEPTH	INTERVA	L (FEET)	11	1-12	0-	1		3-4		0-1	7	-8	8-9	,
				SAMP	LE TYPE	S	OIL	SO	IL	S	OIL	S	OIL	SC	OIL	SOI	IL .
PFAs by Ispotope Dilution	USCO	RSCO	RRSCO	CSCO	Units	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Perfluorobutanoic Acid (PFBA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	0.000033J	0.00056
Perfluoropentanoic Acid (PFPeA)	NC	NC	NC	NC	mg/kg	ND	0.000472	0.000056J	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorobutanesulfonic Acid (PFBS)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorohexanoic Acid (PFHxA)	NC	NC	NC	NC	mg/kg	ND	0.000472	0.000071J	0.000538	ND	0.000574	ND	0.000488	0.000061J	0.000574	ND	0.00056
Perfluoroheptanoic Acid (PFHpA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorohexanesulfonic Acid (PFHxS	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorooctanoic Acid (PFOA)	0.00066	0.0066	0.033	0.500	mg/kg	ND	0.000472	0.000254J	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
1H,1H,2H,2H-Perfluorooctanesulfonic	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluoroheptanesulfonic Acid (PFHp	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorononanoic Acid (PFNA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorooctanesulfonic Acid (PFOS)	0.00088	0.0088	0.044	0.440	mg/kg	ND	0.000472	0.000225JF	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorodecanoic Acid (PFDA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
1H,1H,2H,2H-Perfluorodecanesulfonid	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
N-Methyl Perfluorooctanesulfonamido	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluoroundecanoic Acid (PFUnA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorodecanesulfonic Acid (PFDS)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorooctanesulfonamide (FOSA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
N-Ethyl Perfluorooctanesulfonamidoa	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorododecanoic Acid (PFDoA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorotridecanoic Acid (PFTrDA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
Perfluorotetradecanoic Acid (PFTA)	NC	NC	NC	NC	mg/kg	ND	0.000472	ND	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056
PFOA/PFOS, Total	NC	NC	NC	NC	mg/kg	ND	0.000472	0.000479J	0.000538	ND	0.000574	ND	0.000488	ND	0.000574	ND	0.00056

NOTES

S-32(13-14) - Sample ID(Sample Depth)

mg/kg - milligrams per kilogram

ND- Not Detected

RL - Reporting Limit

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

NYSDEC - New York State Department of Environmental conservation

USCO - NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective

RSCO - NYSDEC Part 375 Residential Use Soil Cleanup Objective CSCO - NYSDEC Part 375 Commercial Use Soil Cleanup Objective

Highlight - Detected Above the NYSDEC USCO

Highlight - Detected Above the NYSDEC USCO and RSCO

Highlight - Detected Above the NYCDEC USCO, RSCO and RRSCO

Table 2A Volatile Organics in Groundwater 1440-1460 39th Street Brooklyn

L	OCATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
SAMPLI	NG DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
LAB SA	MPLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
SAMI	PLE TYPE	WA	ΓER	WA	ΓER	WA'	ΓER	WA	ΓER
	UNITS	uç	j/l	uç	j/l	uç	g/l	uç	j/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organics by GC/MS									
Methylene chloride	5	2.5	U	2.5	U	2.5	U	2.5	U
1,1-Dichloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U
Chloroform	7	2.5	U	2.5	U	2.5	U	2.5	U
Carbon tetrachloride	5	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	1	1	U	1	U	1	U	1	U
Dibromochloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1	1.5	U	1.5	U	1.5	U	1.5	U
Tetrachloroethene	5	4.1		0.5	U	3.2		0.34	J
Chlorobenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
Trichlorofluoromethane	5	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	0.6	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U
Bromodichloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropene, Total		0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5	2.5	U	2.5	U	2.5	U	2.5	U
Bromoform	50	2	U	2	U	2	U	2	U
1,1,2,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	1	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	5	2.5	U	2.5	U	2.5	U	2.5	U
Ethylbenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
Chloromethane		2.5	U	2.5	U	2.5	U	2.5	U
Bromomethane	5	2.5	U	2.5	U	2.5	U	2.5	U
Vinyl chloride	2	1	U	1	U	1	U	1	U
Chloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U
1,1-Dichloroethene	5	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U
Trichloroethene	5	1.1		0.5	U	0.52		0.5	U
1,2-Dichlorobenzene	3	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichlorobenzene	3	2.5	U	2.5	U	2.5	U	2.5	U
1,4-Dichlorobenzene	3	2.5	U	2.5	U	2.5	U	2.5	U
Methyl tert butyl ether	10	2.5	U	2.5	U	2.5	U	2.5	U

Table 2A Volatile Organics in Groundwater 1440-1460 39th Street Brooklyn

T .				MO	•	1 1	V 2	1 1	17 A
	OCATION			MV		MV		MV	
	NG DATE		/2020	11/24			/2020	11/24	
	MPLE ID	L2052		L2052		L2052		L2052	
SAMI	PLE TYPE	WA		WA		WA		WA	
	UNITS	uç		uç		uç		uç	
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organics by GC/MS									
p/m-Xylene	5	2.5	U	2.5	U	2.5	U	2.5	U
o-Xylene	5	2.5	U	2.5	U	2.5	U	2.5	U
Xylenes, Total		2.5	J	2.5	U	2.5	U	2.5	U
cis-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethene, Total		2.5	U	2.5	U	2.5	U	2.5	U
Dibromomethane	5	5	U	5	U	5	U	5	U
1,2,3-Trichloropropane	0.04	2.5	U	2.5	U	2.5	U	2.5	U
Acrylonitrile	5	5	U	5	U	5	U	5	U
Styrene	5	2.5	U	2.5	U	2.5	U	2.5	C
Dichlorodifluoromethane	5	5	U	5	U	5	U	5	U
Acetone	50	2.2	J	2.4	J	5	U	1.6	J
Carbon disulfide	60	5	U	5	U	5	U	5	U
2-Butanone	50	5	U	5	U	5	U	5	U
Vinyl acetate		5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		5	U	5	U	5	U	5	U
2-Hexanone	50	5	U	5	U	5	U	5	U
Bromochloromethane	5	2.5	U	2.5	U	2.5	U	2.5	U
2,2-Dichloropropane	5	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromoethane	0.0006	2	U	2	U	2	U	2	U
1,3-Dichloropropane	5	2.5	U	2.5	U	2.5	U	2.5	U
1,1,1,2-Tetrachloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U
Bromobenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
n-Butylbenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
sec-Butylbenzene	5	2.5	U	2.5	U	2.5	U	4.1	

Table 2A Volatile Organics in Groundwater 1440-1460 39th Street Brooklyn

Lo	OCATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
SAMPLI	NG DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
LAB SA	MPLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
SAMI	PLE TYPE	WA	ΓER	WA	TER	WA'	TER	WA	ΓER
	UNITS	uç	g/l	นดู	g/l	uç	g/l	uç	g/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organics by GC/MS									
tert-Butylbenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
o-Chlorotoluene	5	2.5	U	2.5	U	2.5	U	2.5	U
p-Chlorotoluene	5	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dibromo-3-chloropropane	0.04	2.5	U	2.5	U	2.5	U	2.5	U
Hexachlorobutadiene	0.5	2.5	U	2.5	U	2.5	U	2.5	U
Isopropylbenzene	5	2.5	U	2.5	U	2.5	U	3	
p-Isopropyltoluene	5	2.5	U	2.5	U	2.5	U	2.5	U
Naphthalene	10	2.5	U	2.5	U	0.79	J	2.5	U
n-Propylbenzene	5	2.5	U	2.5	U	2.5	U	3.6	
1,2,3-Trichlorobenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4-Trichlorobenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
1,3,5-Trimethylbenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
1,2,4-Trimethylbenzene	5	2.5	U	2.5	U	2.5	U	2.5	U
1,4-Dioxane		250	U	250	U	250	U	250	U
p-Diethylbenzene		2	U	2	U	2	U	2	U
p-Ethyltoluene		2	U	2	U	2	U	2	U
1,2,4,5-Tetramethylbenzene	5	2	U	2	U	2	U	2	U
Ethyl ether		2.5	U	2.5	U	2.5	U	2.5	U
trans-1,4-Dichloro-2-butene	5	2.5	U	2.5	U	2.5	U	2.5	U

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Minimum Detection Limit

Highlight -Detected Above the NY-AWQS

U- Not Detected

 ${\sf J}$ - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 2004.

Table 2A Volatile Organics in Groundwater 1440-1460 39th Street Brooklyn

Lo	OCATION	MV	V-5	MV	V-6	MW-I	OUP-1	MV	V-7	MV	V-8
SAMPLI	NG DATE	11/20/	/2020	11/20/	/2020	11/20	/2020	11/24		11/24	/2020
LAB SA	MPLE ID	L20521	111-02	L20521	111-01	L2052	111-03	L20520	666-05	L2052	666-04
SAMI	PLE TYPE	WAT	ΓER	WA	ΓER	WA	TER	WA	ΓER	WA	ΓER
	UNITS	ug	j/l	uç	<u>j/l</u>	uç] /l	uç	j/l	uç	g/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organics by GC/MS											
Methylene chloride	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1-Dichloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Chloroform	7	4.1		2.1	J	2.2	J	2.5	U	3.1	
Carbon tetrachloride	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	1	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Tetrachloroethene	5	1.5		0.78		0.81		0.33	J	2.2	
Chlorobenzene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Trichlorofluoromethane	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	0.6	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromodichloromethane	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.4	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichloropropene, Total		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloropropene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromoform	50	2	U	2	U	2	U	2	U	2	U
1,1,2,2-Tetrachloroethane	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzene	1	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Ethylbenzene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Chloromethane		2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Bromomethane	5	2.5	U	2.5	U	2.5	U	2.5	U	1.2	J
Vinyl chloride	2	1	U	1	U	1	U	1	U	1	U
Chloroethane	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1-Dichloroethene	5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Trichloroethene	5	0.28	J	0.5	U	0.5	U	0.28	J	0.35	J
1,2-Dichlorobenzene	3	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3-Dichlorobenzene	3	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,4-Dichlorobenzene	3	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Methyl tert butyl ether	10	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U

Table 2A Volatile Organics in Groundwater 1440-1460 39th Street Brooklyn

LO	OCATION	MV	V-5	MV	V-6	MW-I	OUP-1	MV	V-7	MV	V-8
SAMPLI	NG DATE	11/20	/2020	11/20	/2020	11/20	/2020	11/24	/2020	11/24	/2020
LAB SA	MPLE ID	L2052	111-02	L2052	111-01	L2052	111-03	L2052	666-05	L2052	666-04
SAMI	PLE TYPE	WA	ΓER	WA	ΓER	WA	TER	WA	TER	WA	ΓER
	UNITS	uç]/	uç] /l	u] /l	uç	g/l	uç	j/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organics by GC/MS											
p/m-Xylene	5	2.5	U	2.5	U	2.5	U	2.5	J	2.5	U
o-Xylene	5	2.5	U	2.5	U	2.5	U	2.5	כ	2.5	U
Xylenes, Total		2.5	U	2.5	U	2.5	U	2.5	J	2.5	U
cis-1,2-Dichloroethene	5	2.5	U	2.5	U	2.5	U	2.5	כ	2.5	U
1,2-Dichloroethene, Total		2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Dibromomethane	5	5	U	5	U	5	U	5	כ	5	U
1,2,3-Trichloropropane	0.04	2.5	U	2.5	U	2.5	U	2.5	J	2.5	U
Acrylonitrile	5	5	U	5	U	5	U	5	J	5	U
Styrene	5	2.5	U	2.5	U	2.5	U	2.5	כ	2.5	U
Dichlorodifluoromethane	5	5	U	5	U	5	U	5	J	5	U
Acetone	50	5	U	5	U	5	U	2.5	7	5	U
Carbon disulfide	60	5	U	5	U	5	U	5	J	5	U
2-Butanone	50	5	U	5	U	5	U	5	J	5	U
Vinyl acetate		5	U	5	U	5	U	5	J	5	U
4-Methyl-2-pentanone		5	U	5	U	5	U	5	U	5	U
2-Hexanone	50	5	U	5	U	5	U	5	J	5	U
Bromochloromethane	5	2.5	U	2.5	U	2.5	U	2.5	J	2.5	U
2,2-Dichloropropane	5	2.5	U	2.5	U	2.5	U	2.5	J	2.5	U
1,2-Dibromoethane	0.0006	2	U	2	U	2	U	2	כ	2	U
1,3-Dichloropropane	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,1,1,2-Tetrachloroethane	5	2.5	U	2.5	U	2.5	U	2.5	J	2.5	U
Bromobenzene	5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
n-Butylbenzene	5	2.5	U	2.5	U	2.5	U	0.84	J	2.5	U
sec-Butylbenzene	5	2.5	U	2.5	U	2.5	U	2.3	J	2.5	U

Table 2A Volatile Organics in Groundwater 1440-1460 39th Street Brooklyn

	OCATION		V-5	MV	V-6	MW-I	OUP-1	MV	V-7	MV	V-8
	NG DATE	11/20	/2020	11/20	/2020	11/20	/2020	11/24/	/2020	11/24	/2020
LAB SA	MPLE ID	L2052	111-02	L2052	111-01	L2052	111-03	L20520	666-05	L2052	666-04
SAMI	PLE TYPE	WA	ΓER	WA	ΓER	WA	ΓER	WAT	ΓER	WA	ΓER
	UNITS	นดู		uç		นดู		นยู		uç	
	AWQS	Results	Qual								
Volatile Organics by GC/MS											
tert-Butylbenzene	5	2.5	U								
o-Chlorotoluene	5	2.5	U								
p-Chlorotoluene	5	2.5	U								
1,2-Dibromo-3-chloropropane	0.04	2.5	U								
Hexachlorobutadiene	0.5	2.5	U								
Isopropylbenzene	5	2.5	U	2.5	U	2.5	U	0.92	J	2.5	U
p-Isopropyltoluene	5	2.5	U								
Naphthalene	10	2.5	U								
n-Propylbenzene	5	2.5	U	2.5	U	2.5	U	2.7		2.5	U
1,2,3-Trichlorobenzene	5	2.5	U								
1,2,4-Trichlorobenzene	5	2.5	U								
1,3,5-Trimethylbenzene	5	2.5	U								
1,2,4-Trimethylbenzene	5	2.5	U								
1,4-Dioxane		250	U								
p-Diethylbenzene		2	U	2	U	2	U	1.9	J	2	U
p-Ethyltoluene		2	U	2	U	2	U	2	U	2	U
1,2,4,5-Tetramethylbenzene	5	2	U	2	U	2	U	8.4		2	U
Ethyl ether		2.5	U								
trans-1,4-Dichloro-2-butene	5	2.5	U								

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Mil Highlight -Detected Above the NY-AWQS

U- Not Detected

 $\mbox{\bf J}$ - Result is less than the RL but greater than or equaconcentration is an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Qua

Table 2B Semivolatile Organics in Groundwater 1440-1460 39th Street Brooklyn

LOC	CATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
SAMPLIN	G DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
LAB SAN	APLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
SAMPI	E TYPE	WA	ΓER	WA'	TER	WA'	TER	WA	ΓER
	UNITS	uç	<u>g/l</u>	uç	<u>g/l</u>	uç	g/l	uç	g/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
1,4 Dioxane by 8270D-SIM									
1,4-Dioxane		0.156	U	0.178	U	0.144	J	0.139	U
Semivolatile Organics by GC/M	S								
1,2,4-Trichlorobenzene	5	5	U	5	U	5	J	5	U
Bis(2-chloroethyl)ether	1	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	3	2	U	2	U	2	U	2	U
1,3-Dichlorobenzene	3	2	U	2	U	2	U	2	U
1,4-Dichlorobenzene	3	2	U	2	U	2	U	2	U
3,3'-Dichlorobenzidine	5	5	U	5	U	5	U	5	U
2,4-Dinitrotoluene	5	5	U	5	U	5	U	5	U
2,6-Dinitrotoluene	5	5	U	5	U	5	U	5	U
4-Chlorophenyl phenyl ether		2	U	2	U	2	U	2	U
4-Bromophenyl phenyl ether		2	U	2	U	2	J	2	U
Bis(2-chloroisopropyl)ether	5	2	U	2	U	2	U	2	U
Bis(2-chloroethoxy)methane	5	5	U	5	U	5	J	5	U
Hexachlorocyclopentadiene	5	20	U	20	U	20	U	20	U
Isophorone	50	5	U	5	U	5	J	5	U
Nitrobenzene	0.4	2	U	2	U	2	U	2	U
NDPA/DPA	50	2	U	2	U	2	U	2	U
n-Nitrosodi-n-propylamine		5	U	5	U	5	U	5	U
Bis(2-ethylhexyl)phthalate	5	3	U	2.4	J	3	U	3	U
Butyl benzyl phthalate	50	5	U	5	U	5	U	5	U
Di-n-butylphthalate	50	5	U	5	U	5	U	5	U
Di-n-octylphthalate	50	5	U	5	U	5	U	5	U
Diethyl phthalate	50	5	U	5	U	5	U	5	U
Dimethyl phthalate	50	5	U	5	U	5	U	5	U
Biphenyl		2	U	2	U	2	U	2	U
4-Chloroaniline	5	5	U	5	U	5	U	5	U
2-Nitroaniline	5	5	U	5	U	5	U	5	U
3-Nitroaniline	5	5	U	5	U	5	U	5	U
4-Nitroaniline	5	5	U	5	U	5	U	5	U
Dibenzofuran		2	U	2	U	0.69	J	2	U

Table 2B Semivolatile Organics in Groundwater 1440-1460 39th Street Brooklyn

		440-1400	004104	OOL DIOOL	vi y i i				
LOC	CATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
SAMPLIN	G DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
LAB SAN	1PLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
SAMPI	E TYPE	WA	TER	WA	TER	WA'	TER	WA	ΓER
	UNITS	uç	<u>g/l</u>	uç	<u>g/l</u>	uç	<u>g/l</u>	uç	<u>J/I</u>
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
1,2,4,5-Tetrachlorobenzene	5	10	U	10	U	10	U	10	U
Acetophenone		5	U	5	U	5	U	5	U
2,4,6-Trichlorophenol		5	U	5	U	5	U	5	U
p-Chloro-m-cresol		2	U	2	U	2	U	2	U
2-Chlorophenol		2	U	2	U	2	U	2	U
2,4-Dichlorophenol	1	5	U	5	U	5	U	5	U
2,4-Dimethylphenol	50	5	U	5	U	5	U	5	U
2-Nitrophenol		10	U	10	U	10	U	10	U
4-Nitrophenol		10	U	10	U	10	U	10	U
2,4-Dinitrophenol	10	20	U	20	U	20	U	20	U
4,6-Dinitro-o-cresol		10	U	10	U	10	U	10	U
Phenol	1	5	U	5	U	5	U	5	U
2-Methylphenol		5	U	5	U	5	U	5	U
3-Methylphenol/4-Methylphenol		5	U	5	U	5	U	5	U
2,4,5-Trichlorophenol		5	U	5	U	5	U	5	U
Benzoic Acid		50	U	50	U	50	U	50	U
Benzyl Alcohol		2	U	2	U	2	U	2	U
Carbazole		2	U	2	U	1.1	J	2	U

Table 2B Semivolatile Organics in Groundwater 1440-1460 39th Street Brooklyn

				OOL DI OOI	,				
	CATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
SAMPLIN	G DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
LAB SAN	IPLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
SAMPI	E TYPE	WA	TER	WA	TER	WA	TER	WA	TER
	UNITS	uç	g/l	uç	g/l	uç	g/l	uç] /l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Semivolatile Organics by GC/M	S-SIM								
Acenaphthene	20	0.02	J	0.15		1.2		0.02	J
2-Chloronaphthalene	10	0.2	U	0.2	U	0.2	U	0.2	U
Fluoranthene	50	0.14		2.9		9.5		0.11	
Hexachlorobutadiene	0.5	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	10	0.1	U	0.11		0.98		0.1	U
Benzo(a)anthracene	0.002	0.05	J	1.4		5		0.05	J
Benzo(a)pyrene	0	0.05	J	1.3		4.9		0.04	J
Benzo(b)fluoranthene	0.002	0.08	J	1.8		6.4		0.06	J
Benzo(k)fluoranthene	0.002	0.03	J	0.52		2.4		0.03	J
Chrysene	0.002	0.05	J	1.2		4.4		0.04	J
Acenaphthylene		0.1	U	0.08	J	0.1		0.1	U
Anthracene	50	0.02	J	0.37		1.9		0.02	J
Benzo(ghi)perylene		0.03	J	0.89		2.9		0.03	J
Fluorene	50	0.02	J	0.14		1.5		0.03	J
Phenanthrene	50	0.11		2.1		8.9		0.1	
Dibenzo(a,h)anthracene		0.1	U	0.21		0.76		0.1	U
Indeno(1,2,3-cd)pyrene	0.002	0.04	7	0.94		3.4		0.03	J
Pyrene	50	0.11		2.2		7.5		0.09	7
2-Methylnaphthalene		0.02	J	0.06	J	0.39		0.04	J
Pentachlorophenol	1	0.8	U	0.8	U	0.8	U	0.8	U
Hexachlorobenzene	0.04	0.8	U	0.8	U	0.02	J	0.8	U
Hexachloroethane	5	0.8	J	0.8	U	0.8	U	0.8	U

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Minimum Detection Limit

Highlight -Detected Above the NY-AWQS

U- Not Detected

 ${\sf J}$ - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 2004.

Table 2B Semivolatile Organics in Groundwater 1440-1460 39th Street Brooklyn

LOC	CATION	MV	W-5	MV	V-6	MV	V-7	MV	V-8	MW-l	DUP-1
SAMPLIN	G DATE	11/20	/2020	11/20	/2020	11/24	/2020	11/24	/2020	11/20	/2020
LAB SAM	IPLE ID	L2052	111-02	L2052	111-01	L2052	666-05	L2052	666-04	L2052	111-03
SAMPL	E TYPE	WA	TER	WA'	TER	WA	TER	WA	TER	WA	TER
	UNITS		g/l	ug	g/l	uç	g/l		g/l	u	g/l
	AWQS	Results	Qual								
1,4 Dioxane by 8270D-SIM											
1,4-Dioxane		3.98		4.27		0.178	J	0.134	J	3.14	
Semivolatile Organics by GC/M	<u>S</u>										
1,2,4-Trichlorobenzene	5	5	U	5	U	5	U	5	U	5	U
Bis(2-chloroethyl)ether	1	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	3	2	U	2	U	2	U	2	U	2	U
1,3-Dichlorobenzene	3	2	U	2	U	2	U	2	U	2	U
1,4-Dichlorobenzene	3	2	U	2	U	2	U	2	U	2	U
3,3'-Dichlorobenzidine	5	5	U	5	U	5	U	5	U	5	U
2,4-Dinitrotoluene	5	5	U	5	U	5	U	5	U	5	U
2,6-Dinitrotoluene	5	5	U	5	U	5	U	5	U	5	U
4-Chlorophenyl phenyl ether		2	U	2	U	2	U	2	U	2	U
4-Bromophenyl phenyl ether		2	U	2	U	2	U	2	U	2	U
Bis(2-chloroisopropyl)ether	5	2	U	2	U	2	U	2	U	2	U
Bis(2-chloroethoxy)methane	5	5	U	5	U	5	U	5	U	5	U
Hexachlorocyclopentadiene	5	20	U								
Isophorone	50	5	U	5	U	5	U	5	U	5	U
Nitrobenzene	0.4	2	U	2	U	2	U	2	U	2	U
NDPA/DPA	50	2	U	2	U	2	U	2	U	2	U
n-Nitrosodi-n-propylamine		5	U	5	U	5	U	5	U	5	U
Bis(2-ethylhexyl)phthalate	5	2.1	J	2.6	J	1.7	J	3	U	3.2	
Butyl benzyl phthalate	50	5	U	5	U	5	U	5	U	5	U
Di-n-butylphthalate	50	5	U	5	U	5	U	5	U	5	U
Di-n-octylphthalate	50	5	U	5	U	5	U	5	U	5	U
Diethyl phthalate	50	5	U	5	U	5	U	5	U	5	U
Dimethyl phthalate	50	5	U	5	U	5	U	5	U	5	U
Biphenyl		2	U	2	U	2	U	2	U	2	U
4-Chloroaniline	5	5	U	5	U	5	U	5	U	5	U
2-Nitroaniline	5	5	U	5	U	5	U	5	U	5	U
3-Nitroaniline	5	5	U	5	U	5	U	5	J	5	U
4-Nitroaniline	5	5	U	5	U	5	U	5	U	5	U
Dibenzofuran		2	U	2	U	2	U	2	U	2	U

Table 2B Semivolatile Organics in Groundwater 1440-1460 39th Street Brooklyn

1,2,4,5-Tetrachlorobenzene 5 10 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 2 <th></th> <th></th> <th></th> <th></th> <th>, 00 a i o a</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>					, 00 a i o a							
LAB SAMPLE ID SAMPLE TYPE WATER WATER			MV	V-5	MV	V-6	MV	V-7	MV	V-8	MW-I)UP-1
SAMPLE TYPE	SAMPLIN	G DATE	11/20	/2020	11/20	/2020	11/24	/2020	11/24	/2020	11/20	/2020
UNITS Ug/ Ug/ Ug/ Ug/ Ug/ Ug/ Ug/ Ug	LAB SAN	1PLE ID	L2052	111-02	L2052	111-01	L2052	666-05	L2052	666-04	L2052	111-03
AWQS Results Qual Qual Results Qual Results Qual Q	SAMPL	E TYPE	WA	TER	WA	ΓER	WA	ΓER	WA	ΓER	WA	ΓER
1,2,4,5-Tetrachlorobenzene 5 10 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 2 <td></td> <td>UNITS</td> <td>uç</td> <td>g/l</td> <td>uç</td> <td>g/l</td> <td>uç</td> <td>g/l</td> <td>uç</td> <td>g/l</td> <td>uç</td> <td>ا/ر</td>		UNITS	uç	g/l	uç	g/l	uç	g/l	uç	g/l	uç	ا/ر
Acetophenone		AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
2,4,6-Trichlorophenol 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 5 U 2	1,2,4,5-Tetrachlorobenzene	5	10	U	10	U	10	U	10	U	10	U
P-Chloro-m-cresol 2	Acetophenone		5	U	5	U	5	U	5	U	5	U
2-Chlorophenol 2 U 1 0 U 1 0 U 1 0 0 0 0 0 0 0 0	2,4,6-Trichlorophenol		5	U	5	U	5	U	5	U	5	U
2,4-Dichlorophenol 1 5 U 10 U 1	p-Chloro-m-cresol		2	U	2	U	2	U	2	U	2	U
2,4-Dimethylphenol 50 5 U 10 U	2-Chlorophenol		2	U	2	U	2	U	2	U	2	U
2-Nitrophenol 10 U 20 U 20<	2,4-Dichlorophenol	1	5	U	5	U	5	U	5	U	5	U
4-Nitrophenol 10 U 20 U 10 U 10<	2,4-Dimethylphenol	50	5	U	5	U	5	U	5	U	5	U
2,4-Dinitrophenol 10 20 U 10 U 10 </td <td>2-Nitrophenol</td> <td></td> <td>10</td> <td>U</td> <td>10</td> <td>U</td> <td>10</td> <td>U</td> <td>10</td> <td>U</td> <td>10</td> <td>U</td>	2-Nitrophenol		10	U	10	U	10	U	10	U	10	U
4,6-Dinitro-o-cresol 10 U 5 U <td>4-Nitrophenol</td> <td></td> <td>10</td> <td>U</td> <td>10</td> <td>U</td> <td>10</td> <td>U</td> <td>10</td> <td>U</td> <td>10</td> <td>U</td>	4-Nitrophenol		10	U	10	U	10	U	10	U	10	U
Phenol 1 5 U 5 <td>2,4-Dinitrophenol</td> <td>10</td> <td>20</td> <td>U</td> <td>20</td> <td>U</td> <td>20</td> <td>U</td> <td>20</td> <td>U</td> <td>20</td> <td>U</td>	2,4-Dinitrophenol	10	20	U	20	U	20	U	20	U	20	U
2-Methylphenol 5 U 5	4,6-Dinitro-o-cresol		10	U	10	U	10	U	10	U	10	U
3-Methylphenol/4-Methylphenol 5 U	Phenol	1	5	U	5	U	5	U	5	U	5	U
2,4,5-Trichlorophenol 5 U 5 U 5 U 5 U	2-Methylphenol		5	U	5	U	5	U	5	U	5	U
	3-Methylphenol/4-Methylphenol		5	U	5	U	5	U	5	U	5	U
	2,4,5-Trichlorophenol		5	U	5	U	5	U	5	U	5	U
Benzoic Acid 50 U 50 U 50 U 50 U 50 U	Benzoic Acid		50	U	50	U	50	U	50	U	50	U
Benzyl Alcohol 2 U 2 U 2 U 2 U 2 U 2 U 0 2 U 0	Benzyl Alcohol		2	U	2	U	2	U	2	U	2	U
Carbazole 2 U 2 U 2 U 2 U	Carbazole		2	Ú	2	Ú	2	Ú	2	Ú	2	U

Table 2B Semivolatile Organics in Groundwater 1440-1460 39th Street Brooklyn

						,					
	CATION	MV			V-6	MV		MV		MW-I	
SAMPLIN			/2020		/2020		/2020		/2020		/2020
LAB SAN	1PLE ID	L2052	111-02	L2052	111-01	L2052	666-05	L2052	666-04	L2052	111-03
SAMPL	E TYPE	WA	TER	WA	TER	WA	TER	WA	TER	WA'	TER
	UNITS	uç	g/l	uç	g/l	uç	g/l	uç		uç	g/l
	AWQS	Results	Qual								
Semivolatile Organics by GC/M	S-SIM										
Acenaphthene	20	0.1	U	0.1	U	0.19		0.03	J	0.1	U
2-Chloronaphthalene	10	0.2	U								
Fluoranthene	50	0.06	J	0.1	U	2.2		0.34		0.1	U
Hexachlorobutadiene	0.5	0.5	U								
Naphthalene	10	0.1	U	0.1	U	0.11		0.1	U	0.1	U
Benzo(a)anthracene	0.002	0.04	J	0.1	U	1		0.06	J	0.1	U
Benzo(a)pyrene	0	0.02	J	0.1	U	0.95		0.05	J	0.1	U
Benzo(b)fluoranthene	0.002	0.03	J	0.01	J	1.4		0.08	J	0.1	U
Benzo(k)fluoranthene	0.002	0.01	J	0.1	U	0.44		0.03	J	0.1	U
Chrysene	0.002	0.02	J	0.1	U	1		0.07	J	0.1	U
Acenaphthylene		0.1	U	0.1	U	0.1	J	0.1	U	0.1	U
Anthracene	50	0.1	U	0.1	U	0.27		0.04	J	0.1	U
Benzo(ghi)perylene		0.02	J	0.1	U	0.66		0.04	J	0.1	U
Fluorene	50	0.1	U	0.1	U	0.25		0.04	J	0.1	U
Phenanthrene	50	0.06	J	0.1	U	1.5		0.3		0.1	U
Dibenzo(a,h)anthracene		0.1	U	0.1	U	0.16		0.1	U	0.1	U
Indeno(1,2,3-cd)pyrene	0.002	0.02	J	0.01	J	0.71		0.04	J	0.1	U
Pyrene	50	0.05	J	0.02	J	1.7		0.27		0.03	J
2-Methylnaphthalene		0.1	U	0.1	U	0.06	J	0.1	U	0.1	U
Pentachlorophenol	1	0.8	U								
Hexachlorobenzene	0.04	8.0	U	0.8	U	0.8	U	0.8	U	0.8	U
Hexachloroethane	5	0.8	J	0.8	J	0.8	U	0.8	J	0.8	J

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Min

Highlight -Detected Above the NY-AWQS

U- Not Detected

J - Result is less than the RL but greater than or equa concentrationis an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Qua

Table 2C Pesticides in Groundwater 1440-1460 39th Street Brooklyn

	LOC	CATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
	SAMPLING	G DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
	LAB SAM	IPLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
	SAMPL	E TYPE	WA	TER	WA	TER	WA	TER	WA	ΓER
		UNITS	uç	g/l	uç	g/l	uç	g/l	นดู	j/l
		AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Organochlorine Pes	ticides by G	iC								
Delta-BHC		0.04	0.014	U	0.014	U	0.014	U	0.014	U
Lindane		0.05	0.014	U	0.014	U	0.014	U	0.014	U
Alpha-BHC		0.01	0.014	U	0.014	U	0.014	U	0.014	U
Beta-BHC		0.04	0.014	U	0.014	U	0.014	U	0.014	U
Heptachlor		0.04	0.014	U	0.014	U	0.014	U	0.014	U
Aldrin		0	0.014	U	0.014	U	0.014	U	0.014	U
Heptachlor epoxide		0.03	0.014	U	0.014	U	0.014	U	0.014	U
Endrin		0	0.029	U	0.029	U	0.029	U	0.029	U
Endrin aldehyde		5	0.029	U	0.029	U	0.029	U	0.029	U
Endrin ketone		5	0.029	U	0.029	U	0.029	U	0.029	U
Dieldrin		0.004	0.029	U	0.029	U	0.029	U	0.029	U
4,4'-DDE		0.2	0.029	U	0.029	U	0.029	U	0.029	U
4,4'-DDD		0.3	0.029	U	0.029	U	0.029	U	0.029	U
4,4'-DDT		0.2	0.029	U	0.029	U	0.029	U	0.029	U
Endosulfan I			0.014	U	0.014	U	0.014	U	0.014	U
Endosulfan II			0.029	U	0.029	U	0.029	U	0.029	U
Endosulfan sulfate			0.029	U	0.029	U	0.029	U	0.029	U
Methoxychlor		35	0.143	U	0.143	U	0.143	U	0.143	U
Toxaphene		0.06	0.143	U	0.143	U	0.143	U	0.143	U
cis-Chlordane			0.014	U	0.014	U	0.014	U	0.014	U
trans-Chlordane			0.014	U	0.014	U	0.014	U	0.014	U
Chlordane		0.05	0.143	U	0.143	U	0.143	U	0.143	U

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Minimum Detection Limit Highlight -Detected Above the NY-AWQS

U- Not Detected

 ${\sf J}$ - Result is less than the RL but greater than or equal to the MDL and the concentration s an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 2004.

Table 2C Pesticides in Groundwater 1440-1460 39th Street Brooklyn

LOG	CATION	MV	V-5	MV	V-6	MV	V-7	MV	V-8	MW-l	OUP-1
SAMPLIN	G DATE	11/20	/2020	11/20	/2020	11/24	/2020	11/24	/2020	11/20	/2020
LAB SAM	IPLE ID	L2052	111-02	L2052	111-01	L2052	666-05	L2052	666-04	L2052	111-03
SAMPL	E TYPE	WA	TER	WA	TER	WA	ΓER	WA	TER	WA	ΓER
	UNITS	uç		uç	g/l	uç		uç	g/l	uç	,
	AWQS	Results	Qual								
Organochlorine Pesticides by 0	C										
Delta-BHC	0.04	0.014	U	0.014	J	0.014	U	0.014	U	0.014	U
Lindane	0.05	0.014	U	0.014	J	0.014	U	0.014	U	0.014	U
Alpha-BHC	0.01	0.014	U								
Beta-BHC	0.04	0.014	U	0.014	J	0.014	U	0.014	U	0.014	U
Heptachlor	0.04	0.014	U	0.014	כ	0.014	U	0.014	U	0.014	U
Aldrin	0	0.014	U	0.014	כ	0.014	U	0.014	U	0.014	U
Heptachlor epoxide	0.03	0.014	U	0.014	כ	0.014	U	0.014	U	0.014	U
Endrin	0	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
Endrin aldehyde	5	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
Endrin ketone	5	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
Dieldrin	0.004	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
4,4'-DDE	0.2	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
4,4'-DDD	0.3	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
4,4'-DDT	0.2	0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
Endosulfan I		0.014	U	0.014	J	0.014	U	0.014	U	0.014	U
Endosulfan II		0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
Endosulfan sulfate		0.029	U	0.029	J	0.029	U	0.029	U	0.029	U
Methoxychlor	35	0.143	U	0.143	J	0.143	U	0.143	U	0.143	U
Toxaphene	0.06	0.143	U	0.143	כ	0.143	U	0.143	U	0.143	U
cis-Chlordane		0.014	U	0.014	כ	0.014	U	0.014	U	0.014	U
trans-Chlordane		0.014	U	0.014	כ	0.014	U	0.014	U	0.014	U
Chlordane	0.05	0.143	U								

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Mil Highlight -Detected Above the NY-AWQS

U- Not Detected

J - Result is less than the RL but greater than or equa concentrationis an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Qua

Table 2D PCBs in Groundwater 1440-1460 39th Street Brooklyn

L	OCATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4
SAMPL	ING DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020
LAB S.	AMPLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03
SAM	PLE TYPE	WA	TER	WA	TER	WA	TER	WA	ΓER
	UNITS	uç	g/l	uç	g/l	uç	g/l	นดู	g/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Polychlorinated	l Biphenyls	by GC							
Aroclor 1016	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1221	0.09	0.083	U	0.083	U	0.083	כ	0.083	U
Aroclor 1232	0.09	0.083	U	0.083).083 U		U	0.083	U
Aroclor 1242	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1248	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1254	0.09	0.083	U	0.083	U	0.064	J	0.083	U
Aroclor 1260	0.09	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1262	0.09	0.083	U	0.083	U	0.083	J	0.083	U
Aroclor 1268	0.09	0.083	U	0.083	U	0.083	J	0.083	U
PCBs, Total		0.083	U	0.083	U	0.064	J	0.083	U

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Minimum Detection Limit

Highlight -Detected Above the NY-AWQS

J - Result is less than the RL but greater than or equal to the MDL and the concentrationis an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 20

Table 2D PCBs in Groundwater 1440-1460 39th Street Brooklyn

L	OCATION	MW-	5	MV	V-6	MV	V-7	MV	V-8	MW-I	OUP-1
SAMPL	ING DATE	11/20/20	020	11/20	/2020	11/24	/2020	11/24	/2020	11/20	/2020
LAB S	AMPLE ID	L205211	1-02	L2052	111-01	L2052	666-05	L2052	666-04	L2052	111-03
SAM	PLE TYPE	WATE	CR	WA'	TER	WA	ΓER	WA'.	ΓER	WA	ΓER
	UNITS	ug/l		uç	g/l	uç	g/l	uç	j/l	uç	j/l
	AWQS	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Polychlorinated	d Biphenyls										
Aroclor 1016	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1221	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	C
Aroclor 1232	0.09	0.083	U	0.083	U	0.083 U		0.083	U	0.083	U
Aroclor 1242	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1248	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1254	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1260	0.09	0.083	U	0.083	U	0.083	U	0.034	J	0.083	С
Aroclor 1262	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
Aroclor 1268	0.09	0.083	U	0.083	U	0.083	U	0.083	U	0.083	U
PCBs, Total		0.083 U		0.083 U		0.083	U	0.034	J	0.083	U

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected ab

Highlight -Detected Above the NY-

J - Result is less than the RL but g

approximate value

NY-AWQS: New York TOGS 111 A04.

Table 2E Metals in Groundwater 1440-1460 39th Street Brooklyn

L	OCATION	MV	V-1	MV	V-2	MV	V-3	MV	V-4	MV	V-5	MV	V-6	MV	V-7	MV	V-8	MW-I	DUP-1
SAMPLI	ING DATE	11/24	/2020	11/24	/2020	11/24	/2020	11/24	/2020	11/20	/2020	11/20	/2020	11/24	/2020	11/24	/2020	11/20	/2020
LAB SA	AMPLE ID	L2052	666-02	L2052	666-06	L2052	666-01	L2052	666-03	L2052	111-02	L2052	111-01	L2052	666-05	L2052	666-04	L2052	111-03
SAMI	PLE TYPE	WA	TER	WA	ΓER	WA	ΓER	WA	TER	WA	ΓER	WA	ΓER	WA	TER	WA	ΓER	WA	TER
	UNITS	uç	g/l	uç	j/l	uç	g/l	uç	g/l	uç	j/l	uç	j/l	u	g/l	uç	j/l	uç	g/l
	AWQS	Results	Qual																
General Chemistry																			
Cyanide, Total	200	-	-	-	-	-	-	-	-	5	U	5	U	-	-	- 1	-	5	U
Total Metals																			
Aluminum, Total		5680		39100		7860		11100		4430		1080		20900		3410		1070	
Antimony, Total	3	4	U	40	U	0.68	J	0.47	J	0.69	J	0.62	J	4.71		4	U	4	U
Arsenic, Total	25	3.8		29.64		7.26		8.05		4.41		1.87		16.39		3.05		1.77	
Barium, Total	1000	212.3		626.6		290.9		218.6		179.2		215.2		477.6		210.8		209.1	
Beryllium, Total	3	0.42	J	4.27	J	0.76		0.8		0.34	J	0.11	J	2.14		0.25	J	0.12	J
Cadmium, Total	5	0.31		2.25		0.51		0.45		0.27		0.18	J	1.71		0.17	J	0.2	
Calcium, Total		72300		80000		90400		58200		83500		90700		49000		84200		92000	
Chromium, Total	50	64.44		237.6		118.7		210.7		23.42		4.08		88.92		36.76		4.09	
Cobalt, Total		9.17		102.4		20.85		21.04		11.46		5.79		80.27		8.03		5.28	
Copper, Total	200	24.62		196.5		49.04		49.91		20.93		6.73		97.56		13.87		5.73	
Iron, Total	300	13400		87500		20200		22400		10900		2840		44700		7760		2630	
Lead, Total	25	18.34		304		66.91		25.18		22.15		8.13		87.95		13.46		6.4	
Magnesium, Total	35000	52200		109000		65200		54100		59100		66100		96000		70800		65400	
Manganese, Total	300	3865		4910		1740		1745		791.9		249.4		4284		949.1		276.7	
Mercury, Total	0.7	0.2	U	0.19	J	0.2	U												
Nickel, Total	100	71.73		617.2		157.4		211.4		81.83		46.43		468		57.47		45.09	
Potassium, Total		9150		19400		9130		9780		7600		7720		13300		10100		7930	
Selenium, Total	10	2.12	J	50	U	2	J	2.06	J	3.26	J	5.17		4.88	J	3.12	J	5.26	
Silver, Total	50	0.4	U	4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.16	J	0.4	U	0.4	С
Sodium, Total	20000	97500		88400		129000		52400		117000		172000		95600		137000		167000	
Thallium, Total	0.5	0.19	J	10	U	0.28	J	0.31	J	0.19	J	0.14	J	0.95	J	1	U	0.5	U
Vanadium, Total		27.28		122.1		29.18		33.83		15.37		5.17		81.27		10.5		4.78	J
Zinc, Total	2000	46.1		502		79.47		76.74		41.18		16.97		188.5		36.27		14.82	

ug/L - micrograms per liter

Q - Laboratory Qualifier

Detection Limit

Highlight -Detected Above the NY-AWQS

J - Result is less than the RL but greater than or equal to the MDL and the concentrationis an approximate

value
NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 2004.

Table 2F PFAS in Groundwater 1440-1460 39th Street Brooklyn

	OCATION	MW	_	MW-	_	MW-	-	MW-	-
SAMPL	ING DATE	11/24/2	020	11/24/2	020	11/24/2	020	11/24/2	.020
LAB S.	AMPLE ID	L205266	66-02	L205266	6-06	L205266	6-01	L205266	56-03
SAM	PLE TYPE	WAT	ER	WATI	ER	WATI	ER	WATI	ER
	UNITS	ug/		ug/l		ug/l		ug/l	
Perfluorinated Alkyl Acids by Isotope Dilution	GWSL	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Perfluorobutanoic Acid (PFBA)	0.1	0.00843		0.00982		0.0119		0.0108	
Perfluoropentanoic Acid (PFPeA)	0.1	0.0146		0.0142		0.0217		0.0157	
Perfluorobutanesulfonic Acid (PFBS)	0.1	0.00586		0.00368		0.00598		0.0107	
Perfluorohexanoic Acid (PFHxA)	0.1	0.012		0.00917		0.0147		0.0122	
Perfluoroheptanoic Acid (PFHpA)	0.1	0.0115		0.00574		0.0131		0.00801	
Perfluorohexanesulfonic Acid (PFHxS)	0.1	0.0104		0.0028		0.0044		0.00622	F
Perfluorooctanoic Acid (PFOA)	0.01	0.0812	F	0.0164	F	0.0824	F	0.0431	F
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.1	0.00858	F	0.00447	F	0.00192	JF	0.00366	F
Perfluoroheptanesulfonic Acid (PFHpS)	0.1	0.000796	J	0.00249	U	0.00198	U	0.0019	U
Perfluorononanoic Acid (PFNA)	0.1	0.00132	J	0.00249	U	0.00138	J	0.000662	J
Perfluorooctanesulfonic Acid (PFOS)	0.01	0.0196	F	0.00699	F	0.0133	F	0.007	F
Perfluorodecanoic Acid (PFDA)	0.1	0.000471	JF	0.00249	U	0.00198	U	0.0019	U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	0.1	0.00208	U	0.00249	U	0.00198	U	0.0019	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	0.1	0.00208	U	0.00249	U	0.00198	С	0.0019	U
Perfluoroundecanoic Acid (PFUnA)	0.1	0.00208	U	0.00249	U	0.00198	С	0.0019	U
Perfluorodecanesulfonic Acid (PFDS)	0.1	0.00208	U	0.00249	U	0.00198	U	0.0019	U
Perfluorooctanesulfonamide (FOSA)	0.1	0.00208	U	0.00249	U	0.00198	С	0.0019	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.1	0.00208	U	0.00122	JF	0.00198	U	0.0019	U
Perfluorododecanoic Acid (PFDoA)	0.1	0.00208	U	0.00249	U	0.00198	U	0.0019	U
Perfluorotridecanoic Acid (PFTrDA)	0.1	0.00208	U	0.00249	U	0.00198	U	0.0019	U
Perfluorotetradecanoic Acid (PFTA)	0.1	0.00208	U	0.00249	U	0.00198	U	0.0019	U
Total PFAS	0.5	0.174757		0.07449		0.17078		0.118052	

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Minimum Detection Limit

Highlight -Detected Above the NYS DEC-Groundwater Screening Levels

F-The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

J - Result is less than the RL but greater than or equal to the MDL and the concentrationis an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 2004.

Table 2F PFAS in Groundwater 1440-1460 39th Street Brooklyn

L	OCATION	MV	V-5	MV	W-6	MW-	7	MW-	8	MW-DU	P-1
SAMPLI	NG DATE	11/20	/2020	11/20	/2020	11/24/20	020	11/24/2	020	11/20/20	20
LAB SA	AMPLE ID	L2052	111-02	L2052	111-01	L205266	6-05	L205266	6-04	L2052111	1-03
SAM	PLE TYPE	WA	ΓER	WA	TER	WATE	ER	WATI	ER	WATE	R
	UNITS	uç	g/l	uç	g/l	ug/l		ug/l		ug/l	
Perfluorinated Alkyl Acids by Isotope Dilution	GWSL	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Perfluorobutanoic Acid (PFBA)	0.1	0.0141		0.0361		0.0101		0.0155		0.0331	
Perfluoropentanoic Acid (PFPeA)	0.1	0.0327		0.118		0.019		0.036		0.108	
Perfluorobutanesulfonic Acid (PFBS)	0.1	0.00876		0.0174		0.0103		0.0225		0.0162	
Perfluorohexanoic Acid (PFHxA)	0.1	0.0272		0.0871		0.014		0.0297		0.0805	
Perfluoroheptanoic Acid (PFHpA)	0.1	0.0216		0.0488		0.0114		0.0286		0.0456	
Perfluorohexanesulfonic Acid (PFHxS)	0.1	0.00805		0.00962		0.0114		0.00871	F	0.00987	
Perfluorooctanoic Acid (PFOA)	0.01	0.088	F	0.111	F	0.0629	F	0.0919	F	0.105	F
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.1	0.0246	F	0.013	F	0.00377	F	0.00153	JF	0.00958	F
Perfluoroheptanesulfonic Acid (PFHpS)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.000623	J
Perfluorononanoic Acid (PFNA)	0.1	0.0034		0.00257		0.000943	J	0.00325		0.0026	
Perfluorooctanesulfonic Acid (PFOS)	0.01	0.0214	F	0.0162	F	0.00896	F	0.015	F	0.0174	F
Perfluorodecanoic Acid (PFDA)	0.1	0.000406	J	0.00174	U	0.00252	U	0.00178	U	0.00181	U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	U
Perfluoroundecanoic Acid (PFUnA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	U
Perfluorodecanesulfonic Acid (PFDS)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	U
Perfluorooctanesulfonamide (FOSA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	С
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	С
Perfluorododecanoic Acid (PFDoA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	C
Perfluorotridecanoic Acid (PFTrDA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	U
Perfluorotetradecanoic Acid (PFTA)	0.1	0.00218	U	0.00174	U	0.00252	U	0.00178	U	0.00181	U
Total PFAS	0.5	0.250216		0.45979		0.0719		0.25269		0.122	

Notes:

ug/L - micrograms per liter

Q - Laboratory Qualifier

BOLD - Constituent detected above laboratory Minimum Detection Limit

Highlight -Detected Above the NYS DEC-Groundwater Screening Levels

F-The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

J - Result is less than the RL but greater than or equal to the MDL and the concentrationis an approximate value

NY-AWQS: New York TOGS 111 Ambient Water Quality Standards criteria reflects all addendum to criteria through June 2004.

Table 3.1 Well Surveying Data 1440-1460 39th Street, Brooklyn, New York

Sample Name	Elevation TIC	Depth to Water	Groundwater Elevation
MW-1	52.39	46.01	6.38
MW-2	52.43	46.61	5.82
MW-3	51.4	45.06	6.34
MW-4	52.02	45.6	6.42
MW-5	50.37	44.07	6.3
MW-6	51.89	45.6	6.29
MW-7	52.8	46.42	6.38
MW-8	51.81	45.39	6.42

Table 4.1 Soil Vapor Analytical Data 1440-1460 39th Street Brooklyn

			SV-5				SV-6				SV-7			SV-8				SV-9			SV	10		
	LAB ID:		12	050245-0	1		1.3	2050245-0	12		1	.2050245-0	13		L205024	5-04		1	_2050245-0)5		L2050	245-0)6
COLLECT	TION DATE:			1/12/2020				1/12/2020				11/12/2020			11/12/2				11/12/2020			11/12	_	
	LE DEPTH:																							
SAMPI	E MATRIX:		SO	IL_VAPO	R		SC	OIL_VAPO	R		S	OIL_VAPO	R		SOIL_VA	POR		S	OIL_VAPO	R		SOIL_\	/APC	ıR
ANALYTE	(ug/m3)	Conc	Q	RL	MDL	Conc	o	RL	MDL	Conc	Q	RL	MDL	Conc	RL	MDL	Conc	Q	RL	MDL	Conc	Q R		MDL
VOLATILE ORGANICS IN		COIIC	×.	NL.	WIDL	COILC	٧	NL.	IVIDE	COIIC	×	NL.	IVIDE	COILC	, INL	IVIDL	COILC	· ·	NL.	WIDL	COILC	<u> </u>	_	IVIDE
	AIR	4.05	_	0.000	<u> </u>	0.07	_	0.000		0.50	_	0.000		ND	40.0		NID	4	04.7		ND	0.4	7	
Dichlorodifluoromethane		4.35	+	0.989	-	2.97	+	0.989	1	2.56	-	0.989	-	ND	46.2	+-	ND	+	24.7	-	ND	24		
Chloromethane		0.82	+	0.413		1.18	+	0.413		2.71	-	0.413	+-	ND	19.3		ND	+	10.3		ND	10 34		
Freon-114 Vinyl chloride		ND ND	-	1.4 0.511	-	ND ND	-	1.4 0.511	-	ND ND	-	1.4 0.511	-	ND ND	65.4 23.9		ND ND	+	34.9 12.8	-	ND ND	12		-
1,3-Butadiene	-	8.63	+	0.442	 -	14	+	0.442	⊢÷	24.8	-	0.311	+-	33.2	20.7	+-	ND	+	11.1	-	18.9	11		-
Bromomethane		ND	+	0.777	-	ND	+	0.777	H	ND	\dashv	0.777	+ -	ND	36.3	+-	ND	+	19.4	-	ND	19		
Chloroethane		ND	+	0.528	-	ND	+	0.528	-	ND	\dashv	0.528	-	ND	24.7	+-	ND	+	13.2	-	ND	13		-
Ethanol	1	38.1	+	9.42	 -	17.1	\dashv	9.42	+÷	ND	H	9.42	+-	577	441	+-	251	╁	236	-	ND	23		1
Vinyl bromide	-	ND	+	0.874	-	ND	$^+$	0.874	+	ND	H	0.874	-	ND	40.9	+-	ND	1	21.9	-	ND	21		-
Acetone	1	25.7	+	2.38	-	65.1	$^{+}$	2.38	H-	28.5	H	2.38	-	1140	111	+-	399	1	59.4	-	352	59		-
Trichlorofluoromethane	t	1.64	+	1.12	 -	1.7	\dashv	1.12	T -	1.81	Ħ	1.12	 -	ND	52.5	T -	ND	t	28.1	-	ND	28		
Isopropanol		ND	\dashv	1.23	-	ND	\dashv	1.23	-	ND	Ħ	1.23	-	ND	57.5		ND	t	30.7	-	ND	30		-
1,1-Dichloroethene	0.2	ND	+	0.793	-	ND	+	0.793	-	ND	T	0.793	-	ND	37.1	-	ND	T	19.8	-	ND	19		<u> </u>
Tertiary butyl Alcohol	V.2	3.88	+	1.52	-	ND	\dashv	1.52	-	ND	Ħ	1.52	-	111	70.9	-	ND	t	37.9	-	ND	37		-
Methylene chloride	3	ND	+	1.74	-	2.4	_	1.74	-	ND	T	1.74	-	ND	81.3	-	ND	t	43.4	-	ND	43		-
3-Chloropropene		ND	+	0.626	-	ND	_	0.626	-	ND	T	0.626	-	ND	29.3	-	ND	t	15.7	-	ND	15		-
Carbon disulfide		8.07	-	0.623	-	3.99		0.623	-	9.4	T	0.623	-	ND	29.1	-	ND	Т	15.6	-	ND	15		-
Freon-113		ND	-	1.53	-	ND		1.53	-	ND	T	1.53	-	ND	71.7	-	ND	Т	38.3	-	ND	38		-
trans-1,2-Dichloroethene		ND	1	0.793	-	ND	_	0.793	-	ND		0.793	-	ND	37.1	-	ND		19.8	-	ND	19		-
1.1-Dichloroethane		ND	1	0.809	-	ND	_	0.809	-	ND		0.809	-	ND	37.8	-	ND		20.2	-	ND	20		-
Methyl tert butyl ether		ND		0.721	-	ND		0.721	-	ND		0.721	-	ND	33.7	-	ND		18	-	ND	1	В	-
2-Butanone		237		1.47	-	150		1.47	-	89.1		1.47	-	9500	69	-	3660		36.9	-	3390	36	.9	-
cis-1,2-Dichloroethene	0.2	ND		0.793	-	ND		0.793	-	ND		0.793	-	ND	37.1	-	ND		19.8	-	ND	19	.8	-
Ethyl Acetate		ND		1.8	-	ND		1.8	-	1.88		1.8	-	ND	84.3	-	ND		45	-	ND	4	5	-
Chloroform		8.11		0.977	-	1.66		0.977	-	12		0.977	-	ND	45.7	-	ND		24.4	-	ND	24	.4	-
Tetrahydrofuran		14.7		1.47	-	16		1.47	-	24.6		1.47	-	ND	69	-	ND		36.9	-	ND	36	.9	-
1,2-Dichloroethane		ND		0.809	-	ND		0.809	-	ND		0.809	-	ND	37.8	-	ND		20.2	-	ND	20		-
n-Hexane		15.5		0.705	-	24.6		0.705	-	21.4		0.705	-	52.2	33	-	ND		17.6	-	33.6	17		-
1,1,1-Trichloroethane	3	ND		1.09	-	2.23		1.09	-	2.27		1.09	-	ND	51	-	ND		27.3	-	ND	27		-
Benzene		4.95		0.639	-	10.4		0.639	-	11.9		0.639	-	ND	29.9	-	ND		16	-	ND	1		-
Carbon tetrachloride	0.2	ND		1.26	-	ND		1.26	-	ND		1.26	-	ND	58.8		ND		31.5	-	ND	31		-
Cyclohexane		3.06		0.688	-	5.09		0.688	-	3.99		0.688	-	ND	32.2		ND		17.2	-	ND	17		-
1,2-Dichloropropane		ND	_	0.924	-	ND	_	0.924	-	ND		0.924	-	ND	43.2		ND		23.1	-	ND	23		-
Bromodichloromethane		ND	_	1.34	-	ND	_	1.34	-	ND	Щ	1.34	-	ND	62.6		ND	1	33.5	-	ND	33		-
1,4-Dioxane	0.0	ND		0.721	-	ND	4	0.721	-	ND	Ц	0.721	-	ND	33.7	-	ND	1	18	-	ND	1		-
Trichloroethene	0.2	ND 10.1	-	1.07	-	ND	+	1.07	 -	1.57	Н	1.07	-	ND	50.2		ND	1	26.9	-	ND	26		-
2,2,4-Trimethylpentane	1	10.1	-	0.934	-	24.4	_	0.934	-	8.17	H	0.934	-	ND	43.7	-	ND	1	23.4	-	ND 24.5	23		-
Heptane	-	9.18	+	0.82	-	16.5	+	0.82	-	14.1	\vdash	0.82 0.908	-	ND	38.3		ND	+	20.5		24.5	20 22		-
cis-1,3-Dichloropropene 4-Methyl-2-pentanone	-	ND 2.77	+	0.908 2.05	-	ND ND	+	0.908 2.05	-	ND 3.48	H	2.05	-	ND ND	42.4 95.9		ND ND	+	51.2	-	ND ND	51		-
trans-1,3-Dichloropropene	-	ND	+	0.908	-	ND	+	0.908	-	3.46 ND	H	0.908	+-	ND	42.4		ND	+	22.7	-	ND	22		-
1.1.2-Trichloroethane	-	ND	+	1.09	-	ND	+	1.09	L .	ND	H	1.09	-	ND	42.4 51	+ -	ND	+	27.3	-	ND	27		-
Toluene	-	26	+	0.754	-	36.1	+	0.754	+-	26.3	H	0.754	-	95.3	35.2		63.3	+	18.8	-	67.8	18		-
2-Hexanone	 	32.6	+	0.754	-	22.5	+	0.754	1	14.7	\dashv	0.754	+-	549	38.3	+ -	297	+	20.5	-	331	20		-
Dibromochloromethane	-	ND	+	1.7	-	ND	$^+$	1.7	+-	ND	H	1.7	+ -	ND ND	79.7	- -	ND	1	42.6	-	ND	42		-
1,2-Dibromoethane	1	ND	+	1.54	-	ND	$^+$	1.54	+-	ND	H	1.54	+-	ND	71.9		ND	1	38.4	-	ND	38		H
Tetrachloroethene	3	7.12		1.34	-	6.67	1	1.36		6.07	Н	1.34	-	ND	63.4	+ -	ND	1	33.9	-	ND	33		-
Chlorobenzene		ND	+	0.921	-	ND	+	0.921	-	ND		0.921	-	ND	43.1	+ -	ND	1	23	-	ND	2		-
Ethylbenzene	1	5.47	+	0.869	-	6.04	$^{+}$	0.869	H	5.82	H	0.869	+-	ND	40.6		ND	1	21.7	-	ND	21		-
p/m-Xylene	1	18.2	+	1.74	-	18.9	$^{+}$	1.74	H-	19.9	H	1.74	-	ND	81.2		ND	1	43.4	-	ND	43		-
Bromoform		ND	-	2.07	-	ND	\dashv	2.07	-	ND	H	2.07	-	ND	96.7	-	ND	٢	51.7	-	ND	51		-
Styrene		ND	\dashv	0.852	-	ND	\dashv	0.852	+ -	ND	Ħ	0.852	-	ND	39.8	-	ND	t	21.3	-	ND	21		-
1,1,2,2-Tetrachloroethane	1	ND	\dashv	1.37	-	ND	\neg	1.37	-	ND	Ħ	1.37	-	ND	64.2		ND	т	34.3	-	ND	34		Η-

Table 4.1 Soil Vapor Analytical Data 1440-1460 39th Street Brooklyn

	SAMPLE ID:					SV-6			SV-7			SV-8			SV-9			SV-10	
	LAB ID:	L	2050245-0)1	L	.2050245-0	02		L2050245-0	03	L	2050245-0)4	L	2050245-	05	L2	2050245-	06
COLLECT	ION DATE:		11/12/2020)		11/12/2020	0		11/12/202	0		11/12/2020)		11/12/202	0	1	1/12/202	0
	LE DEPTH:												_						
				_	_	011 1/4 0/			0011 1/40	_	_	011 1/4 0/	_	_	011 1/40/		-		
SAMPL	E MATRIX:		OIL_VAPO	K	S	OIL_VAPO)K		SOIL_VAPO	JR	S	OIL_VAPO	K	S	OIL_VAPO	JR	SC	OIL_VAPO	UK
	DOH=SSC	<u> </u>																	
NALYTE	(ug/m3)	Conc Q	RL	MDL	Conc Q	RL	MDL	Conc	RL.	MDL	Conc Q	RL	MDL	Conc Q	RL	MDL	Conc Q	RL	MD
Xylene		7.6	0.869	-	8.04	0.869	-	8.12	0.869	-	ND	40.6	-	ND	21.7	-	ND	21.7	-
Ethyltoluene		0.993	0.983	-	ND	0.983	-	1.04	0.983	-	ND	46	-	ND	24.6	-	ND	24.6	-
3,5-Trimethylbenzene		1.82	0.983	-	1.82	0.983	-	1.95	0.983	-	ND	46	-	ND	24.6	-	ND	24.6	-
2,4-Trimethylbenzene		6.44	0.983	-	6.64	0.983	-	7.13	0.983	-	ND	46	-	ND	24.6	-	ND	24.6	-
enzyl chloride		ND	1.04	-	ND	1.04	-	ND	1.04	-	ND	48.4	-	ND	25.9	-	ND	25.9	-
3-Dichlorobenzene		ND	1.2	-	ND	1.2	-	ND	1.2	-	ND	56.2	-	ND	30.1	-	ND	30.1	-
4-Dichlorobenzene		ND	1.2	-	ND	1.2	-	ND	1.2	-	ND	56.2	-	ND	30.1	-	ND	30.1	-
2-Dichlorobenzene		ND	1.2	-	ND	1.2	-	ND	1.2	-	ND	56.2	-	ND	30.1	-	ND	30.1	-
2,4-Trichlorobenzene		ND	1.48	-	ND	1.48	-	ND	1.48	-	ND	69.4	-	ND	37.1	-	ND	37.1	-
exachlorobutadiene		ND	2.13	-	ND	2.13	-	ND	2.13	-	ND	99.7	-	ND	53.3	-	ND	53.3	-

APPENDIX A SOIL BORING / MONITORING WELL CONSTRUCTION LOGS

	C		S		PROJECT NAME	E: 1440-1460 39th St. E	Brooklyn	GEOPROBE NO.	7822DT
					LOCATION	N: S-32		JOB NO.	10737
		NSULT			METHOL	D: Direct Push		GROUND ELEVATION:	
GEOP	ROBE BY:				DATE STARTED			GROUNDWATER TABLE DEPT	H:
INSPE	CTOR:				DATE COMPLETED	D: 11/10/2020 0 Hr.		24 Hr. Dat	
DEPTH		SAMPLE	DE	PTH	510 (ID 01 II 451 IT 41		•		
(ft)	RECOVERY (in)	TUBE	FROM	TO	ENVIRONMENTAL SOIL SAMPLE NAME	SOIL DE	SCRIPT	ION AND STRATIFICATION	PID
0	()	No.	(ft)	(ft)	SOIL SAIVIFEE NAIVIE	-			
	26		0		S-32 (Surface)	Fill: Concrete and Bri	ck		0
						Brow Clayey SILT, so	me coai	rse to fine sand, some gravel	
					S-32(3-4)				
5				5					
	11		5						
					S-32(6-7)	Brown coarse to fine	SAND, s	some coarse to fine Gravel, little Silt	
10				10					
	16		10						
								RAVEL, coarse to fine Sand;	
						trace of Silt with rock	fragme	nts	
					S-32(13-14)				
15				15					
	36		15				0.4415		
					0.00(47.40)	Brown coarse to fine			
					S-32(17-18)	trace of Silt with rock	tragme	nts	
20				20		-			
20	35		20	20					
	- 33		20		S-32(22-23)	White coarse to fine (2RAV/FI	., coarse to fine Sand;	
					0-02(22-20)	trace of Silt with rock			
						- Lago of Olic Will Floor	nagmon		
25				25					
	31		25						
						Brown-gray coarse to	fine SA	ND, coarse to fine Gravel;	
				27		trace of Silt with rock			
30							REFUS	SAL AT ±27 FEET.	
35									
1						4			
40									
					 1				
	al I.D. of Ho							ined for the design and estimating purpo	
Nomin	al I.D. of Ba	irrei Samp	ier					ey may have access to the same informa	
-								not intended as a substitute for investiga	
								on the logs should not be relied upon wi from which these logs were extracted.	imout the geotechnical
						mendations contained in the Penetrometer: DP: Direct		from which these logs were extracted.	

	C		0		P	PROJECT NAME:	1440-1460 39th St. Brooklyn	GEOPROBE NO.	7822DT			
	Q		01			LOCATION:	S-33	JOB NO.	10737			
	EN	GINE	ERS			METHOD:	Direct Push	GROUND ELEVATION:				
GEOP	ROBE BY:		Aarco		[DATE STARTED:	11/4/2020	GROUNDWATER TABLE DEPTH:				
INSPE	CTOR:	J	ack N./Jeff	L.	DAT	E COMPLETED:	11/4/2020 0 Hr.	24 Hr. Date				
DEPTH		SAMPLE	DE	PTH	ENIV/	IDONMENTAL						
(ft)	RECOVERY (in)	TUBE	FROM	TO		IRONMENTAL SAMPLE NAME	SOIL DESCRIPT	ION AND STRATIFICATION	PID			
0	. ,	No.	(ft)	(ft)	00.2	9, 22,2						
	43	1	0		S-	33 (Surface)	Fill: Concrete, stone		0			
							Brown Sandy-SILT					
						S-33(4-5)						
5				5								
	29	2	5									
						S-33(6-7)	Brown Silty-CLAY					
40				40								
10	25	2	40	10								
	35	3	10				Drown Cilty Cl AV brown are	. Cand with real fragments				
							Brown Silty-CLAY, brown-gra	y Sand with rock tragments				
					S	S-33(13-14)						
15				15		5-00(10-14)						
	17	4										
					S	S-33(16-17)	Brown SAND, purple-gray roo	ks				
						, ,						
20												
	45	5	20									
							Brown coarse to fine SAND, s	some Gravel				
					S	8-33(22-23)						
25				25								
							REFU	SAL AT ± 25 FEET				
30												
30												
				 	1		1					
							1					
35												
40												
						1						
Nominal I.D. of Hole								ined for the design and estimating purposes				
Nominal I.D. of Barrel Sampler					1% in 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							
					1	1	· -	-	-			
								on the logs should not be relied upon witho	at the geotechnical			
					engineers recommendations contained in the report from which these logs were extracted. Pro Pocket Penetrometer: DP: Direct Puch							

	C		0		Р	ROJECT NAME:	1440-1460 39th St. Brooklyn	GEOPROBE NO.	7822DT
			5 1			LOCATION:	S-34	JOB NO.	10737
	EN	GINE	ERS			METHOD:	Direct Push	GROUND ELEVATION:	
GEOP	ROBE BY:		Aarco			DATE STARTED:	11/6/2020	GROUNDWATER TABLE DEPTH:	
INSPE	CTOR:	Jac	ck N./Rach	el F.	DAT	E COMPLETED:	11/6/2020 0 Hr.	24 Hr. Date	
DEPTH		SAMPLE	DE	PTH	ENIV/	IDONIMENTAL			
(ft)	RECOVERY (in)	TUBE	FROM	TO		IRONMENTAL SAMPLE NAME	SOIL DESCRIPT	ION AND STRATIFICATION	PID
0		No.	(ft)	(ft)					
	40	1	0		S-S	34 (Surface)	Fill: Reddish-brown brick and	concrete	0
					,	S-34 (4-5)			
_									
5	00	0	_	5					<u> </u>
	32	2	5			0.04 (7.0)	Fill: Reddish-brown brick and	concrete, Brown CLAY, some gravel	
					,	S-34 (7-8)			
10				10					
	41	3	10				Fill: Potential caving in, Browr	n coarse to fine sand:	
							some Gravel, concrete, and b		
					S	-34 (13-14)			
15				15					
	32	4	15						1.4
							Fill: Potential caving in, Browr	n coarse to fine native sand;	1.4
					S	-34 (18-19)	some Gravel		36.7
									13.9
20				20					23
		5	20						0
							Backfill, coarse to fine native	SAND	
				04					
25				24	5	5-34(23-24)	DEFLIC	SAL AT ± 24 FEET	_
23							KEFUS	DAL AT 124 FEET	
30									
							1		
35									
40									
40				<u> </u>	I		<u>l</u>		
Nomin	allD of Lo				in	The subsurface in	formation chaven haraon was abta	ined for the design and estimating purposes	e for our aliant
Nominal I.D. of Hole Nominal I.D. of Barrel Sampler								ry may have access to the same information	
	or Do	o. Gamp	.5.		778111	1		ot intended as a substitute for investigation	
						1	· -	on the logs should not be relied upon without	-
						1		from which these logs were extracted.	5
						_	Panatromatar: DP: Direct Puch	Č .	

SESI						PROJECT NAME:	1440-1460 39	th St. Brooklyn	GEOPROBE NO.	7822DT
	<u> </u>		01			LOCATION:	S-	-35	JOB NO.	10737
	EN	GINE	ERS			METHOD:	Direct	t Push	GROUND ELEVATION:	
GEOP	ROBE BY:		Aarco		[DATE STARTED:	11/6/2020		GROUNDWATER TABLE DEPTH:	
INSPE	CTOR:	Jac	ck N./Rach	el F.	DAT	E COMPLETED:	11/6/2020	0 Hr.	24 Hr. Date	
DEPTH		SAMPLE	DE	PTH	ENIV/	UDONMENTAL				
(ft)	RECOVERY (in)	TUBE	FROM	TO		IRONMENTAL SAMPLE NAME	SC	OIL DESCRIPTI	ION AND STRATIFICATION	PID
0		No.	(ft)	(ft)						
		1	0		S-	35 (Surface)	Fill: Reddish-b	orown brick, grav	vel and concrete, Brown CLAY	0
							4			
						S-35 (4-5)	4			
_				-			4			
5		2	5	5			D OLAY	D C	No. and 1.1.14b b 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	
			5			S-35 (7-8)	Brown CLAY,	Brown coarse S	Sand with some brown/red/gray gravel	
						3-33 (1-0)	1			
							1			
10				10			1			
		3	10				Brown CLAY,	Brown coarse S	Sand with some brown/red/gray gravel	
							1		0.70	
]			
					S	5-35 (11-12)				
15				15						
		4	15				<u>]</u>			
							Brown coarse	to fine native Sa	and with little Brown Clay	
					S	5-35 (18-19)	4			
00							4			
20		-	20	20						
		5	20				Drawn acaras	to fine notive C	and with some group!	
							brown coarse	to line native Sa	and with some gravel	
					S	G-35 (21-22)	1			
25				25		7-00 (Z 1-ZZ)				
		6	25				Brown coarse	to fine native Sa	and with some gravel and boulders	
							1		3	
							1			
				29						
30										
							1			
							4			
							1			
25							4			
35							-			
							1			
							1			
							1			
40							1			
							•			•
Nomin	al I.D. of Ho	ole			in.	The subsurface in	formation shown	hereon was obtai	ined for the design and estimating purposes	s for our client.
Nominal I.D. of Barrel Sampler				1% in	It is made availabl	le to authorized u	sers only that the	y may have access to the same information	n available	
		·				to our client. It is	presented in good	d faith, but it is n	ot intended as a substitute for investigation	ns, interpretations
									on the logs should not be relied upon without	out the geotechnical
						_	endations contain	-	from which these logs were extracted.	
						• Une Doolrot	vanatramatar: DD	r i broot Duch		

SESI						PROJECT NAME:	1440-1460 3	9th St. Brooklyn	GEOPROBE NO.	7822DT
	0					LOCATION:		S-36	JOB NO.	10737
		GINE				METHOD:	Dire	ct Push	GROUND ELEVATION:	
GEOP	ROBE BY:		Aarco			DATE STARTED:	11/6/2020		GROUNDWATER TABLE DEPTH:	
	CTOR:	Jac	k N./Rach	el F.		E COMPLETED:	11/6/2020	0 Hr.	24 Hr. Date	
DEPTH		SAMPLE		PTH	2711		117072020			
(ft)	RECOVERY	TUBE	FROM	то		IRONMENTAL		SOIL DESCRIPT	ION AND STRATIFICATION	PID
0	(in)	No.	(ft)	(ft)	SOIL	SAMPLE NAME	`	JOIL DEGUNIT	ION AND STRATIFICATION	116
		1	0		S-	36 (Surface)	Black/gray sl	ab, Brown coarse	e to fine Sand	0
					Ť	00 (04.1400)		as, 2.0 ooa.o.	5 to 11110 Gaine	
					1	S-36 (4-5)	1			
						3-30 (4-3)	1			
_				_			4			
5			_	5						_
		2	5						wn coarse to fine Sand, Brown Clay;	
							Some gravel			
						S-36 (8-9)				
10				10						
		3	10				Fill, Brown co	parse to fine San	d, some Gravel	
					S	5-39 (13-14)	1		,	
							1			
					1		1			
15				15			4			
15		4	45	15						
		4	15		_		_			
					S	3-36 (18-19)	Brown coars	e to fine Sand, so	ome Gravel	
20				20						
		5	20							
					S	3-36 (22-23)	Brown coars	e to fine Sand, so	ome Gravel	
25				25						
		6	25							
							Brown coars	e to fine Sand, so	ome Gravel	
							1	,		
				29			1			
30										
							1			-
							1			-
							1			<u> </u>
							4			
							4			
35							4			
]			
]			
]			
40										
				-						
Nomin	al I.D. of Ho	ole			in.	The subsurface in	formation show	n hereon was obta	ined for the design and estimating purposes	s for our client.
									ey may have access to the same information	
						1			not intended as a substitute for investigation	
									on the logs should not be relied upon without	-
									from which these logs were extracted.	a. and geoteeninear
-					1	engineers recomm	CHUALIONS COND	amed in the report	nom which these logs were extracted.	

	C				Р	ROJECT NAME:	1440-1460 39th St. Brooklyn	GEOPROBE NO.	7822DT
			0 1			LOCATION:	S-37	JOB NO.	10737
		GINE				METHOD:	Direct Push	GROUND ELEVATION:	
GEOP	ROBE BY:		Aarco			DATE STARTED:		GROUNDWATER TABLE DEPTH:	
	CTOR:		JRN/JLL			E COMPLETED:		24 Hr. Date	
DEPTH		SAMPLE	DE	PTH	END //	DONACNITAL			
(ft)	RECOVERY (in)	TUBE	FROM	TO		RONMENTAL SAMPLE NAME	SOIL DESCRIPT	ION AND STRATIFICATION	PID
0	,	No.	(ft)	(ft)	COIL	STATE LE TATAVIL			
	41		0		S-3	37 (Surface)	Fill: Concrete and Brick fragm	ents	0
							Brown Silty-Clay, little coarse	to fine Sand	
					;	S-37(4-5)			
				_					
5	40			5					
	43		5			0.07(0.0)	D OII T		
					,	S-37(8-9)	Brown SILT, some coarse to f	ine Sand; traces of Gravei	
10				10					
-10	19		10	10					
							Brown-gray coarse to fine SAI	ND, some coarse to fine Gravel;	
							trace of Silt with rock fragmen		
					S	-37(12-13)	Ĭ		
15				15					
	22		15				1		
				17	S	-37(16-17)			
20							REFUSAL AT	± 17 FEET on 11/10/2020	
			20				Brown CLAY, Brown coarse to	o fine Sand, some gravel	
					S-	-37 (22-23)			
25				25					
25				23					1
30									
35									
40									
40					<u> </u>		<u> </u>		
Namin	al I.D. of Ho	No.			in	The subsection is	formation above 1	ined for the design on Itime-time	for our allt
	al I.D. of Ho		ler					ined for the design and estimating purposes by may have access to the same information	
NOTHIN	ai 1.D. UI Da	iiiei Saiiip	ICI					of intended as a substitute for investigation	
								on the logs should not be relied upon witho	-
								from which these logs were extracted.	<u>6</u> -3-4-1111001
						D D 1 . 1		<i>6</i>	

	engineers recommendations contained in the rep	ort from which these logs we	ere extracted.
	Pp: Pocket Penetrometer; DP: Direct Push	l.	
	Approximate Change in Strata:	Inferred Change in Strata:	

	C		0		Р	ROJECT NAME:	1440-1460 39th St. Brooklyn	GEOPROBE NO.	7822DT		
	Q		01			LOCATION:	S-38	JOB NO.	10737		
	EN	GINE	ERS			METHOD:	Direct Push	GROUND ELEVATION:			
GEOP	ROBE BY:		Aarco			DATE STARTED:	11/10/2020	GROUNDWATER TABLE DEPTH:			
INSPE	CTOR:				DAT	E COMPLETED:	11/10/2020 0 Hr.	24 Hr. Date			
DEPTH		SAMPLE	DE	PTH	ENIV/	IDONIMENTAL					
(ft)	RECOVERY (in)	TUBE	FROM	TO		IRONMENTAL SAMPLE NAME	SOIL DESCRIPT	ION AND STRATIFICATION	PID		
0		No.	(ft)	(ft)							
	13	1	0		S-	38 (Surface)	Fill: Concrete	0			
							Suspected Fill: Brown SILT, s	,			
						S-38(4-5)	little coarse to fine Sand with	rock fragments			
_											
5	32	2	5	5							
	32		5			S-38(6-7)	Brown-gray coarse to fine SAI	ND searce to fine Cravel:			
						DUP-3	trace silt with rock fragments	ND, coarse to line Graver,			
						DOI -3	trace siit with rock fragments				
10				10			1				
	32	3	10								
							Purple coarse to fine GRAVEI	_, some coarse to fine sand			
							with rock fragments				
					S	-38(13-14)	1				
15				15							
			15				REFUSAL AT	± 15 FEET on 11/10/2020	0		
							Brown coarse to fine SAND, s	ome white Gravel/Boulders			
20				20							
			20				Brown coarse to fine SAND, s	ome Gravel/Boulders			
							-				
							-				
25				25			1				
							1				
							1				
							1				
30											
]				
35											
					-		1		-		
					<u> </u>		1		-		
40							1				
				1	I		ı		1		
Nomin	al I.D. of Ho	ole			in.	The subsurface in	formation shown hereon was obtain	ned for the design and estimating purpose	s for our client.		
Nominal I.D. of Parrel Sampler					1% in It is made available to authorized users only that they may have access to the same information available						
		·						ot intended as a substitute for investigation			
						or judgment of suc	ch authorized users. Information of	on the logs should not be relied upon without	out the geotechnical		
						engineers recomm	endations contained in the report	from which these logs were extracted.			
1						Day Doolsot I	Panatromater: DP: Direct Puch				

	C				Р	ROJECT NAME:	1440-1460 3	9th St. Brooklyn	GEOPROBE NO.	7822DT		
			91			LOCATION:		S-39	JOB NO.	10737		
		NSULT				METHOD:	Dire	ct Push	GROUND ELEVATION:			
GEOP	ROBE BY:		Aarco			DATE STARTED:	11/4/2020	Ct i doi!	GROUNDWATER TABLE DEPTH:			
	CTOR:	J	ack N./Jeff	L.	-	E COMPLETED:	11/4/2020	0 Hr.	24 Hr. Date			
DEPTH		SAMPLE	DE	PTH								
(ft)	RECOVERY (in)	TUBE	FROM	TO		IRONMENTAL SAMPLE NAME	5	SOIL DESCRIPTION AND STRATIFICATION				
0	()	No.	(ft)	(ft)	JOIL	OAMI LE NAME						
	40	1	0		S-3	39 (Surface)	Fill: Concrete	slab		0		
					;	S-39 (2-3)	Brown Silty-C					
5			_	5						_		
	32	2	5		ļ .		Brown Silty-S	SAND				
					,	S-39 (7-8)						
							Drawn aray	SAND with rock f	'raamanta	_		
10				10			brown-gray s	SAND WITH TOCK I	ragments			
-10	41	3	10	10	1		Brown Clave	v-SILT Brown S	and, some white rocks			
		Ü	10				Diowii Olayo	y-OIL1, DIOWITO	and, some write rooks			
					S	-39 (12-13)						
15				15		,						
	32	4	15									
							Brown coarse	e to fine sand, so	ome white rock fragments			
					S	-39 (18-19)						
20				20								
	51		20									
					S	-39 (21-22)	4		ray/yellow coarse to fine GRAVEL			
							and coarse to	o fine Sand, trace	e of Silt with rock fragments			
0.5				0.5								
25				25				ODING + 25 FF	ET. DID NOT ENCOUNTER REFUSAL			
							END OF B	ORING ± 25 FE	ET. DID NOT ENCOUNTER REFUSAL	-		
					1							
30												
35												
40							ł					
40				l	<u> </u>							
Nomi-	al I.D. of Ho	Jo.			in	The substitute is	Fammatia1- :	m hamaan1 :	ined fantha decien on I retire the r	a for our clit		
									ined for the design and estimating purpose			
NOMMA	ai 1.D. UI Da	nei Sanipi	G1		1 /8 1/1	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations						
						1	-		on the logs should not be relied upon with	-		
									from which these logs were extracted.	6- 3.00 mileur		
					1	1			6			

	C	F			PROJECT NAME:	1440-1460 3	9th St. Br	ooklyn	GEOPROBE NO.		7822DT
	901	VSULTI	NG		LOCATION:	S	S-40		JOB NO.		10737
	EN	GINEE	RS		METHOD:	Direc	ct Push		GROUND ELEVATION:		
GEOP	ROBE BY:				DATE STARTED:	11/11/2020			GROUNDWATER TABLE	DEPTH:	
INSPE	CTOR:				DATE COMPLETED:	11/11/2020	0 Hr.		24 Hr.	Date	
DEPTH		SAMPLE	DEI	PTH	ENIVED ON IMPORTAL						
(ft)	RECOVERY (in)	TUBE	FROM	то	ENVIRONMENTAL SOIL SAMPLE NAME	s	OIL DES	CRIPTI	ON AND STRATIFICATION		PID
0	()	No.	(ft)	(ft)	OOIL GAIVII EL NAIVIL						
	21	1	0		S-40 (Surface)	Fill: Asphalt a	nd Brick				0
					, ,	Brown SILT,	some coa	rse to	fine Sand, trace of Gravel		
					S-40 (2-3)	with Asphalt a	and brick	fragme	ents		
					,	i .					
5				5		1					
	32	2	5			Brown Clayey	/-SILT, litt	tle coar	se to fine Sand		
					S-40 (7-8)	1					
					DUP-5	1					
10				10		Brown/gray c	oarse to f	ine GR	AVEL coarse to fine Sand:		
	32	3	10			Brown/gray coarse to fine GRAVEL, coarse to fine Sand; trace of Silt with Brick and Rock fragments					
					S-40 (11-12)	Purple coarse to fine GRAVEL, some coarse to fine Sand with rock fragments					
					0 10 (11 12)	Light Gray/Red coarse to fine GRAVEL some coarse to fine Sand					
						with brick fragments					
15				15				AND	little coarse to fine Gravel;		
	27	4	15			little Silt with rock fragments					
		· ·	10				ook nagi	nonto			
					S-40 (16-17)	ł					
					3-40 (10-17)	Gray coarse t	o fine GE	ρΛ\/ Ε Ι	little coarse to fine Sand;		
20				20		trace of Silt w					
	48	5	20	20				_	little coarse to fine Gravel;		
	10		20			little Silt with			illie coarse to line Graver,		
					S-40 (23-24)				RAVEL, some coarse to fine S	and:	
					3-40 (23-24)	trace of Silt w				ariu,	
25				25		liace of Silt w	IIII IOCK II	ayıneı	iis		
	54	6	25	23							
	J 4	"	20			Intormittant	overe ef-	Drows	red, and gray coarse to fine S	CAND.	-
						+	•			JANU;	
						Coarse to line	Giavei, I	uace of	Silt with rock fragments		
30				30		-					
30	44	7	30	30		ł					
	41	/	30			-					
2.5				0.5							
35	- ·		0.5	35							
	54	8	35								
40				40							

Nominal I.D. of Hole	in.	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Barrel Sampler	1% in	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 geotechnica
		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:

	OFOL					ECT NAME:	1440-1460 3	9th St. B	rooklvn	GEOPROBE NO.	7	'822DT
	S	SES				LOCATION:		-40		JOB NO.		10737
	C	ONSULTING NGINEERS				METHOD:		t Push		GROUND ELEVATION:		
GEOP	ROBE BY:		Aarco		DATE	STARTED:		or don	GI	ROUNDWATER TABLE DEPTI	H:52 FEE	T
	CTOR:	Jac	k N./Dens	ie A.			11/11/2020	0 Hr.			Date	··-
DEPTH		SAMPLE	DE	PTH						<u> </u>		
(ft)	RECOVERY (in)	TUBE	FROM	ТО	ENVIRON SOIL SAMI		s	OIL DES	CRIPTI	ON AND STRATIFICATION		PID
40		No.	(ft)	(ft)								
	54	9	40				1			some coarse to fine Gravel;		0
							trace of Silt w					
							1	•		ed/gray coarse to fine SAND;	ŀ	
45				45			coarse to line	Gravei,	trace o	f Silt with rock fragments	ŀ	
75		10	45	40			1				ŀ	
							†				ŀ	
1							†				•	
							†				ľ	
50				50			1				ľ	
	58	11	50				Brown coarse	to fine S	SAND, I	ittle coarse to fine Gravel;		
							trace of Silt w	ith rock f	fragmer	its		
					S-40 (51-52)	Light Gray-pւ	rple coa	rse to fi	ne SAND with rock fragments		
							Brown coarse to fine SAND, little coarse to fine Gravel;					
55				55			trace of Silt, s	aturated	l wet			
			55									
							END OF BO	RING ±	55 FEE	T. DID NOT ENCOUNTER RE	FUSAL	
							1					
60				60								
							-					
				<u> </u>			-				ŀ	
							1				ŀ	
65							+				ŀ	
							†				ŀ	
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]					
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							1].	
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							1					
80							1				ŀ	
00					ļ							
Nomin	allD of Ho	nle			in The	subsurface int	formation shows	n hereon s	was obto	ined for the design and estimating	nurnoses f	or our client
	Nominal I.D. of Hole Nominal I.D. of Barrel Sampler									ey may have access to the same info		
. 10//////	Nominal I.D. of Barrel Sampler									not intended as a substitute for inve		
				_					on the logs should not be relied up	-	-	
					+ or yu		damonzou us			and the state of t		Sectionino

	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretat
	or judgment of such authorized users. Information on the logs should not be relied upon without the geotec
	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:

											78771	T/AIVIS FOWEI		
	C				F	ROJECT NAME:	1440-1460 3	9th St. E	Brooklyn	GEOPROBE NO.	70220	Probe		
	0		01			LOCATION:	: :	S-41		JOB NO.		10737		
	CO	NSULT	ING			METHOD:	Dire	ct Push		GROUND ELEVATION:				
GEOP	ROBE BY:		Aarco			DATE STARTED:		CLFUSII		GROUNDWATER TABLE D	EDTH:			
	CTOR:	De	ensie A/Jac	rk N		E COMPLETED:		0 Hr.	1	24 Hr.	Date			
DEPTH	OTOIN.	SAMPLE		PTH	DAI	L COMI LETED.	11/11/2020	0 1 11 .		1211111	Date			
(ft)	RECOVERY	TUBE	FROM	то		IRONMENTAL	9	SOIL DE	SCRIPT	ION AND STRATIFICATION		PID		
0	(in)	No.	(ft)	(ft)	SOIL	SAMPLE NAME								
	34	1	0	()	S-	41 (Surface)	Fill: Concrete and Brick, Brown Sandy-CLAY, some Gravel and asphalt;							
						(=======	No slight odd			·, ·,		10.5		
						S-41(4-5)		•	Ü			0		
5				5										
	39	2	5				Fill: Concrete	and Bric	k, Browr	Sandy-CLAY, some Gravel and	d asphalt;			
						S-41(7-8)	no odor, som	e Concr	ete and	rock fragments				
10				10										
		3	10											
										n coarse to fine sand;				
							some gray ro	ck fragm	nents					
					S	5-41(12-13)								
15				15							_			
										ND, some coarse to fine Gravel	l;			
							trace Silt with		_					
							Pink-gray coa Silt with rock			VEL, little coarse to fine Sand, t	trace of			
20										some coarse to fine Gravel;				
							trace Silt with			omo ocaroo to mio oravor,				
									.9					
							Gray coarse	to fine G	RAVEL,	some coarse to fine Sand;				
							trace Silt with	rock fra	gments					
25														
								E	ND OF	BORING ± 25 FEET				
30														
35														
- 33														
							1							
40														
				•								•		
Nomin	al I.D. of Ho	ole								ined for the design and estimating				
Nomin	al I.D. of Ba	rrel Sampl	ler		1¾ in	It is made availabl	le to authorized	users onl	y that the	y may have access to the same info	ormation a	vailable		
										ot intended as a substitute for inve	-	-		
-										on the logs should not be relied upon		the geotechnical		
						_	nendations conta		-	from which these logs were extract	ted.			

	C	F	31		PROJECT NAME:	1440-1460 3	oth St. B	rooklyn	GEOPROBE NO.		7822DT
	COL	SULTI	NG		LOCATION:	s	-42		JOB NO.		10737
		GINEER			METHOD:	Direc	ct Push		GROUND ELEVATION:		
GEOPI	ROBE BY:		Aarco		DATE STARTED:	11/5/2020			GROUNDWATER TABL	E DEPTH:	
	CTOR:	.lac	k N./Densi	e A.	DATE COMPLETED:		0 Hr.		24 Hr.	Date	
DEPTH		SAMPLE		PTH	3, 2 3 3 mi EE 1 ED.	, 5, 2020			ļ · ···	12410	
	RECOVERY	TUBE	FROM		ENVIRONMENTAL	۰		CRIDTI	ON AND STRATIFICATION	J	PID
(ft) 0	(in)	No.	(ft)	TO (ft)	SOIL SAMPLE NAME		OIL DES	OINE II	ON AND STRATIFICATION	v	FID
	33	1	0	·	S-42 (Surface)	Brown Sandy	CLAY, s	ome me	dium to fine Rock fragments	s and Gravel	0
					S-42 (3-4)						
					3-42 (3-4)						
5				5							
	34	2	5								
						Brown Sandv	CLAY	some me	edium to fine Gravel		
					S-42 (7-8)		,				
					0 72 (1-0)						
10				10							
10	20	_	40	10		D 01.437					
	36	3	10			t	coarse	Sand, so	ome medium to fine Gravel;		
					S-42 (13-14)	coarse Rock					
15				15							
	60	4	15						<u> </u>		
					S-42 (17-18)	Brown medium	to fine S	AND mix	ked with purple Rock fragment	s and Gravel	
					. ,						
20				20							
	55	5	20								
	55		20		S 40 (04 00)	Drown	to 6 0	V VID ;	rod with number Deels from and	o and C	
					S-42 (21-22)	prown mealum	i to line S	AND MI	red with purple Rock fragment	s and Gravel	
25				25							
	60	6	25								
						Brown mediu	m to fine	SAND	mixed with Rock fragments	and Gravel	
30				30							
	60	7	30			Brown mediu	m to fine	SAND	mixed with Rock fragments	and Gravel	
								ا ۱۱۰ ۱۱۰ ۱۰	24 ROOK Huginorita	514701	
25				25							
35	00		0.5	35							
	60	8	35								
						Brown medium	to fine S	AND, so	me Gravel; medium to fine Ro	ock fragments	
40				40							
Nomina	al I.D. of Ho	ole			in. The subsurface in	formation show	n hereon	was obta	ined for the design and estima	ting purposes	for our client.
	al I.D. of Ba		er						ey may have access to the same		
		ap.			1			,	, , built		

Nominal I.D. of Hole	in.	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Barrel Sampler	1% in	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 geotechnica
		engineers recommendations contained in the report from which these logs were extracted.
		Pp: Pocket Penetrometer; DP: Direct Push
		Approximate Change in Strate: Inferred Change in Strate:

		EC			PROJECT NAME	: 1440-1460 3	9th St. Brookl	yn GEOPROBE NO.	7822DT					
	G	DNSULTIN	IG		LOCATION	1	5-42	JOB NO.	10737					
	E	NGINEER	8		METHOD	: Dire	ct Push	GROUND ELEVATION:						
GEOP	ROBE BY:		Aarco		DATE STARTED			GROUNDWATER TABLE DEP	PTH:					
	CTOR:	Jac	k N./Dens	ie A.	DATE COMPLETED		0 Hr.		ate					
DEPTH		SAMPLE	DE	PTH	ENIVIDONIMENTAL									
(ft)	RECOVERY (in)	TUBE No.	FROM	ТО	ENVIRONMENTAL SOIL SAMPLE NAME	s	OIL DESCRIF	PTION AND STRATIFICATION	PID					
40	60	NO.	(ft) 40	(ft)		- I			0					
	60		40			Rock fragme		ND, some medium to fine Gravel;						
						Trock flagfile	1113							
						†								
45				45		1								
	60		45						39.5					
						-1		ID, some medium to fine Gravel;						
						Gray coarse	SAND							
50				50		-			0.5					
30			50	30		+			0.5					
						Brown mediu	m to fine SAN	ID, some medium to fine Gravel;						
						Brown/Gray			29.7					
						1 1			36.9					
55				55					0					
						_								
						4								
60						+								
						1								
						†								
						1								
65						1								
						4								
						4								
						+								
70						†								
						1								
]								
						1								
						4								
75						4								
	<u> </u>					-								
					1	1								
						1			_					
80						1								
	•			•		•			Į.					
lomin	nal I.D. of Ho	ole			in. The subsurface in	nformation show	n hereon was o	btained for the design and estimating put	rposes for our client.					
	nal I.D. of Ho nal I.D. of Ba		ler					they may have access to the same inform						

Nominal I.D. of Hole	in.	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Barrel Sampler	1% in	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.

	C		0		F	ROJECT NAME:	1440-1460 39th St. B	7822DT								
			01			LOCATION:	S-43		JOB NO.	10737						
	EN	GINE	ERS			METHOD:	Direct Push		GROUND ELEVATION:							
GEOP	ROBE BY:		Aarco		[DATE STARTED:	11/4/2020		GROUNDWATER TABLE DEPT	 ГН:						
INSPE	CTOR:	J	ack N./Jefl	f L.	DAT	E COMPLETED:	11/4/2020 0 Hr.		24 Hr. Da	ite						
DEPTH		SAMPLE	DE	PTH	ENIV/	IRONMENTAL										
(ft)	RECOVERY (in)	TUBE	FROM	TO		SAMPLE NAME	SOIL DES	SOIL DESCRIPTION AND STRATIFICATION								
0		No.	(ft)	(ft)												
	21	1					Fill: Brown coarse to f	fine SAN	ID, some coarse to fine Gravel;	0						
							trace of Silt with brick	and con	crete fragments							
_																
5	30	2					White-gray rock fragn		agrae to fine Cravel	-						
	30						Some coarse to fine S									
								Jana, aa								
10							1									
	29	3					Brown coarse to fine	SAND, s	ome coarse to fine Gravel;							
							little Silt with rock frag	gments								
15	00	4														
	39	4					D CI CII T -		to fine Cond.							
							Brown Clayey-SILT, s little coarse to fine Gr									
							illile coarse to line Gr	avei wili	Trock fragments							
20							Brown coarse to fine	SAND. s	come coarse to fine Gravel;							
	50	5					little Silt with rock frag		,							
							Brown Silty-CLAY, so	me coar	se to fine Gravel;							
							coarse to fine Sand w									
25																
	30	6														
							* · ·		ND, some coarse to fine Gravel,							
							little Silt with rock frag	jmenis								
30							END OF	BORING	G. REFUSAL AT ± 28 FEET							
							2112 01	DOM	O. N.E. 00/NE/N 1201 EE 1							
							1									
35						-										
							1			<u> </u>						
40							•									
40	l															
Nomin	al I.D. of Ho	ole			in.	The subsurface int	formation shown hereon	was obtai	ined for the design and estimating purp	ooses for our client.						
	al I.D. of Ba		ler			4			y may have access to the same informa							
						1			ot intended as a substitute for investiga							
						or judgment of suc	ch authorized users. Info	rmation o	on the logs should not be relied upon w	vithout the geotechnica						
						_		-	from which these logs were extracted.							
							Penetrometer; DP: Direct									
						Approximate Char	nge in Strata:	Inf	ferred Change in Strata:							

SESI					PF	ROJECT NAME:	GEOPROBE NO.	7822DT	
	<u> </u>		01			LOCATION:	S-44	JOB NO.	10737
	EN	GINE	ERS			METHOD:	Direct Push	GROUND ELEVATION:	
GEOP	ROBE BY:		Aarco		D.	ATE STARTED:	11/9/2020	GROUNDWATER TABLE DEPTH:	
INSPE	CTOR:		Jack N.		DATE	COMPLETED:	11/9/2020 0 Hr.	24 Hr. Date	
DEPTH	RECOVERY	SAMPLE	DE	PTH	ENI/II	RONMENTAL			
(ft)	(in)	TUBE	FROM	TO		SAMPLE NAME	SOIL DESCRIPT	ION AND STRATIFICATION	PID
0		No.	(ft)	(ft)					
	31	1			S-4	4 (Surface)	Brown/gray coarse to fine SA	ND, trace of Gravel and Silt	0
					9	S-44 (4-5)	Brown Clayey-SILT, some fine	e Sand	+
					Ĭ	7 11 (10)	Brown Glayby GIET, Golfie IIII		
5							Coarse to fine SAND, little Gr	avel and Silt	
	40	2							
							Brown SILT, little medium to f	ine Sand	
					S	6-44 (7-8)		ay coasre to fine GRAVEL, brown	
40							coarse to fine Sand, trace of S	Silt with rock fragments	
10	44	3					Brown Clayey-SILT, some co	area to fine Sand	_
	44	3			S-	44 (13-14)		ay coasre to fine GRAVEL, red/brown	_
						11 (10 11)	coarse to fine Sand, trace of S	•	
							(14-14.5) Yellow medium to fi	9	
15									
	40	4							
					S-	44 (17-18)	Brown coarse to fine SAND, li	ittle coarse to fine Gravel;	
							trace Silt with rock fragments		
20									
20	49	5					Brown coarse to fine SAND a	nd Silt traces of Gravel	
					S-	44 (22-23)		ND, some coarse to fine Gravel;	_
							trace of Silt with rock fragmen		
25							REFUSAL AT ± 2	4.5 FEET. END OF BORING	
30									
35									
40									
			1						
Nomin	al I.D. of Ho	ole						ined for the design and estimating purposes	
Nomin	al I.D. of Ba	rrel Samp	ler		1¾ in	It is made availabl	e to authorized users only that the	ey may have access to the same information	ı available
					-		· -	ot intended as a substitute for investigation	-
								on the logs should not be relied upon witho	ut the geotechnical
-					+	-	endations contained in the report	from which these logs were extracted.	

	C	FS	2		PROJECT NAME:	1440-1460 39th St. Brooklyn	GEOPROBE NO.	7822DT
		USULTI			LOCATION:	S-45	JOB NO.	10737
		GINEE			METHOD:	Direct Push	GROUND ELEVATION:	
GEOP	ROBE BY:				DATE STARTED:	11/10/2020	GROUNDWATER TABLE DEPTH:	
	CTOR:				DATE COMPLETED:	 	24 Hr. Date	
DEPTH		SAMPLE	DEI	PTH		' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	!	
(ft)	RECOVERY	TUBE	FROM	то	ENVIRONMENTAL	SOIL DESCRIPTI	ON AND STRATIFICATION	PID
0	(in)	No.	(ft)	(ft)	SOIL SAMPLE NAME			
	34		0	()	S-45 (Surface)	Fill: Concrete and Brick		0
					o io (curiaco)	Brown SILT, some coarse to	fine Sand	1
					S-45 (3-4)	Brown Gizt, come coarde to	and Cana	
					0 10 (0 1)	Brown coarse to fine SAND, so	ome Gravel, little Silt with rock fragments	
5				5			AVEL, some coarse to fine Sand	
-	30		5			with Rock fragments	TVEE, Some coarse to line cand	
			-		S-45 (8-9)	Brown coarse to fine SAND, s	come Silt traces of Gravel	_
					3-43 (0-9)	with Rock fragments	one on, naces of Graver	
						With Nock fragments		
10				10		-		
10	31		10	10		+		
	31		10			-		
						Drown coarse to fine CAND, as	and Crayal little Cilt with real from an anta	+
					0.45 (40.40)	-	ome Gravel, little Silt with rock fragments	
45				45	S-45 (12-13)	Purple coarse to fine GRAVEL, II	ttle coarse to fine Sand with rock fragments	•
15	00		45	15		D		_
	26		15			Brown coarse to fine SAND, o	coarse to fine Gravei;	
						little Silt with rock fragments		
					S-45 (16-17)	Gray coarse to fine GRAVEL,		
						trace of Silt with Rock Fragme	ents	
20	40			20				
	42		20					
						Brown coarse to fine natïve S	AND, trace of Silt	
						-		
						1		
25				25		_		
						_		
30								
						1		
]		
35								
]		
]		
]		
40								
Nomin	al I.D. of Ho	ole			in. The subsurface in	formation shown hereon was obta	ined for the design and estimating purpose	s for our client.
Nomin	al I.D. of Ba	rrel Sampl	er		1% in It is made availab	le to authorized users only that the	ey may have access to the same information	n available
					to our client. It is	presented in good faith, but it is i	not intended as a substitute for investigation	ns, interpretations
	· ·				or judgment of su	ch authorized users. Information	on the logs should not be relied upon with	out the geotechnical

Nominal I.D. of Barrel Sampler	178 111	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, interpretati
		or judgment of such authorized users. Information on the logs should not be relied upon without the geotecl
		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:

					<u> </u>	DO 1507				ocoppose vo						
	S	ESI			<u> </u>				Brooklyn	GEOPROBE NO.		322DT				
	CO EN	NSULTING IGINEERS				LOCATION:	S	-45		JOB NO.	1	0737				
						METHOD:		t Push		GROUND ELEVATION:						
	ROBE BY:		Aarco		_	ATE STARTED:				GROUNDWATER TABLE DEPT	PID 0 0 0 0 0 0 0					
	CTOR:		k N./Dens		DAT	E COMPLETED:	11/10/2020	0 Hr.		24 Hr. Dat	te ,					
DEPTH	RECOVERY	SAMPLE		PTH	FNV	ENVIRONMENTAL SOIL DESCRIPTION AND STRATIFICATION										
(ft) 40	(in)	TUBE No.	FROM (ft)	TO (ft)		SAMPLE NAME	S	OIL DE	SCRIPTI	ON AND STRATIFICATION		PID				
			40									0				
							1				L					
							1				L					
											L					
45				45			1				L					
			45				Brown coarse	to fine S	SAND, so	ome Boulders, Dirty yellow Sand (52-	53)					
							1				L					
							1				L					
							1				L					
50				50			1				L					
			50				1				L					
							1				L					
					S	-45 (52-53)	1				L	46.4				
											L	0				
55				55								0				
									End B	oring at 55 ft-bgs	L					
											L					
											L					
60																
]									
65																
											Γ					
70																
											Γ					
											Γ					
75							1				Γ					
											Γ					
											ſ					
											Γ					
											Γ					
80											「					
Nomin	nal I.D. of Ho	ole			in.	The subsurface int	formation show	n hereon	was obta	ined for the design and estimating purp	oses fo	r our client.				
Nomin	nal I.D. of Ba	arrel Samp	ler							ey may have access to the same information						
										not intended as a substitute for investiga						
						1				on the logs should not be relied upon w						
						l *. *						-				

Nominal I.D. of Barrer Sampler	178111	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, interpretation
		or judgment of such authorized users. Information on the logs should not be relied upon without the geotechr
		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:

					CT NAME.		20th C	trant Dr	م ماداد س					MONUT	ODINO WELL NO	т.	DM 4
S	SES	SI			ECT NAME:			treet, Br	оокіуп						ORING WELL NO.	_	/W-1
00	NSULT	ING		PROJE	ECT LOCATION:		New Y	ork						JOB N		10)737:6
	NGINEE	RS										- 1		GROU	ND ELEVATION:	<u> </u>	
BORING BY: AARCO					STARTED		11/1	18/20	DEVEL	OPMEN	NT PER	IOD			INSIDE CASING DIAMETER (in	1)	2"
INSPECTOR: John N	Norgard			DATE	COMPLETED		11/1	18/20	DEVEL	OPME	NT MET	HOD	Pu	mp	BOREHOLE DIAMETER (in)		3.75"
NJ DEP PERMIT NO	D.:			DATE	DEVELOPED		11/1	18/20	DEVEL	OPME	NT RAT	E	# g	pm	INITIAL WATER LEVEL (ft):		46.1
	WE	LL CON	ISTRUC	TION		DEPTH (ft)	Sample	0/6	Blows or	n Spoor 12/18	18/24	REC (in)		SOIL I	DESCRIPTION AND STRATIFIC	CATION	P.I.D.
Depth (feet below	grade)							0/0	0/12	12/10	10/2-7	(111)					
Top of Casing:	#	‡ <u>-</u>															
Ground Surface	C)			Casing Type:												
Top of Riser	0.87' AGS	-			Mell Con.	5											
Top of Seal	42				Well Cap:												
1					Grout Type: Bentonite												
Top of Sand Pack	45.83	1			Well Key:												
						10											
					Riser Pipe: PVC												
Top of Screen	45.83					15											
'																•	
					Sand/Gravel												
					Pack Size: #2 Sand	20											
					T don 0120. 112 Gard											•	
					Screen Size:												
					Screen Size:												
						25											
						∠5											
						30										•	
						35											
																·	
Bottom of Screen	55.83	1															
Bottom of Boring	55.83	1															
Remarks:					•												
						40											
l					Change in Strata				Inferre				<u> </u>				

		31	PROJE	CT NAME:		39th St	reet, Br	ooklyn				MON	ITORING WELL NO.	MV	V-2
5	上		PROJE	ECT LOCATION:		New Y	ork					JOB I	NO.	107	37:6
O C	NSULTI NGINEEI	NG RS										GRO	UND ELEVATION:		
BORING BY: AARC	0		DATE S	STARTED		11/2	21/20	DEVEL	OPMEN	IT PERI	OD	•	INSIDE CASING DIAMETER (in)	1"
INSPECTOR: John I	Norgard		DATE (COMPLETED		11/2	21/20	DEVEL	OPMEN	IT METH	HOD	Pump	BOREHOLE DIAMETER (in)		1.75"
NJ DEP PERMIT NO	D.:		DATE [DEVELOPED		11/2	21/20	DEVEL	OPMEN	IT RATE		# gpm	INITIAL WATER LEVEL (ft):		46.7'
	WEL	L CONSTRU	CTION		DEPTH (ft)	Sample	0/6	Blows o	n Spoor 12/18	18/24	REC	SOII	_ DESCRIPTION AND STRATIFIC.	ATION	P.I.D.
Depth (feet below	arada)						0/0	0/12	12/10	10/24	(111)				0.4
Top of Casing:	grade) #														0.4
Ground Surface	0			Casing Type:											
Top of Riser	0.6'														
rop of rescr	AGS				5										
				Well Cap:											
Top of Seal	1'														
l [*]				Grout Type: Bentonite											
Top of Sand Pack	39.32'			Well Key:											
					10										
				Riser Pipe: PVC											
Top of Screen	39.32'				15										
				Sand/Gravel											
				Pack Size: #2 Sand	20										
				Screen Size:											
					25									_	
									<u> </u>						
					30				<u> </u>					_	
									<u> </u>						
					35				<u> </u>						
	40.00					<u> </u>			<u> </u>						
Bottom of Screen	49.32'		1						<u> </u>						
Bottom of Boring	49.32'			J											
Remarks:									<u> </u>						
				e Change in Strat	40						in Stra				ļ

			חחס ור	OT NAME:		2041- 04	D	I do					MONUT	CODING WELL NO		
SF	S			ECT NAME:			treet, Br	оокіуп				ŀ		ORING WELL NO.		MW-3
CONSU	JLTING		PROJE	ECT LOCATION:		New Y	ork						JOB N		1	0737:6
ENGIN	NEERS										- 1		GROU	ND ELEVATION:		
BORING BY: AARCO				STARTED		11/1	6/20	DEVEL	OPMEN	NT PER	IOD			INSIDE CASING DIAMETER	in)	2"
INSPECTOR: John Norga	ard		DATE (COMPLETED		11/1	6/20	DEVEL	OPME1	NT MET	HOD	Pui	mp	BOREHOLE DIAMETER (in)		3.75"
NJ DEP PERMIT NO.:			DATE I	DEVELOPED		11/1	8/20	DEVEL	OPME1	NT RAT	E	# g	pm	INITIAL WATER LEVEL (ft):		45.11
V	WELL CC	NSTRUC	TION		DEPTH (ft) 0	Sample	0/6	Blows or	n Spoor 12/18	18/24	REC (in)		SOIL	DESCRIPTION AND STRATIF	ICATION	P.I.D.
Depth (feet below grade	e)				0		0/0	0/12	12/10	10/24	(111)					
Top of Casing:	#															
Ground Surface	0			Casing Type:												
Top of Riser 0.5 AG					5											
Top of Seal	47'			Well Cap:												
				Grout Type: Bentonite												
Top of Sand Pack 50.).11'	00000		Well Key:												
I					10											
1																
				Riser Pipe: PVC												
				ruser ripe. r vo												
50).11'				15											
Top of Screen					10											_
				Sand/Gravel												
				Pack Size: #2 Sand	20											
				Screen Size:												
					25											
					30											
					0.5											
					35	-										
	:0 11 ¹															
Bottom of Gorcon	0.11'															
	0.11'															
Remarks:																
					40	I										

				DDO II	TOT NAME:		2041- 0	tt D-	lab						CODINO WELL NO	Т.	
S	F	SI			ECT NAME:			treet, Br	оокіуп						ORING WELL NO.	+	/IW-4
co	NSULT	ING		PROJE	ECT LOCATION:		New Y	ork						JOB N		10)737:6
	NGINEE	RS							ı			-		GROU	ND ELEVATION:	<u> </u>	
BORING BY: AARCO					STARTED		11/2	20/20	DEVEL	OPMEN	NT PER	IOD			INSIDE CASING DIAMETER (in)	2"
INSPECTOR: John N	Norgard			DATE	COMPLETED		11/2	20/20	DEVEL	OPME1	NT MET	HOD	Pu	mp	BOREHOLE DIAMETER (in)		3.75"
NJ DEP PERMIT NO).:			DATE	DEVELOPED		11/2	21/20	DEVEL	OPME1	NT RAT	E	# g	pm	INITIAL WATER LEVEL (ft):		45.65
	WE	LL CON	STRUC	TION		DEPTH (ft)	Sample	0/6	Blows of	n Spoor 12/18	18/24	REC		SOIL	DESCRIPTION AND STRATIFIC	ATION	P.I.D.
Depth (feet below	grade)							0/0	0/12	12/10	10/24	(111)					
Top of Casing:	#	<u>.</u>			_								1				
Ground Surface	C				Casing Type:								İ				
Top of Riser	0.3' AGS	•		,	Well Cap:	5											
Top of Seal	42				vveн Сар.												
					Grout Type: Bentonite												
Top of Sand Pack	45.2				Well Key:												
						10										,	
					Riser Pipe: PVC												
Top of Screen	45.2	•				15											
													1				
													1				
					Sand/Gravel								1				
					Pack Size: #2 Sand	20							1				
													1			•	
													1				
					Screen Size:								İ				
													İ				
						25	\vdash					Н	l				
1													l				+
							-						1				
												\vdash	1				
							-						l				
						20	-						l				
						30							l				
1							<u> </u>						l				<u> </u>
1							<u> </u>					\vdash					
												$\vdash \vdash$					
													ļ				
						35											
Bottom of Screen	55.2	Ί															
Bottom of Boring	55.2]												
Remarks:				_													
						40							<u> </u>				
					Change in Strata				Inferr								

		21		PROJE	ECT NAME:		39th S	treet, Br	ooklvn					MONIT	ORING WELL NO.		/IW-5
S	上	51			ECT LOCATION:		New Y		,					JOB N		+	737:6
CO	NSULT	ING		TROOL	201 200/11/014.		I tow I	Onc							ND ELEVATION:		7707.0
BORING BY: AARCO		.1,0		DATE	CTARTER		44/4	10/00	DEV/EI	ODMEN	IT DED	100	l .	GROU			Oll
					STARTED			13/20	DEVEL						INSIDE CASING DIAMETER (in)	2"
INSPECTOR: John N					COMPLETED		1	13/20		OPMEN			Pu 		BOREHOLE DIAMETER (in)		3.75"
NJ DEP PERMIT NO).:			DATE	DEVELOPED		11/1	18/20	DEVEL	OPMEN	NT RAT	E	# g	pm	INITIAL WATER LEVEL (ft):		45.12
	WE	LL CON	STRUC	TION		DEPTH (ft) 0	Sample	0/6	Blows o	n Spoor 12/18	18/24	REC (in)		SOIL	DESCRIPTION AND STRATIFIC	ATION	P.I.D.
Depth (feet below	grade)																
Top of Casing:	#	<u> </u>			i												
Ground Surface	C				Casing Type:												
Top of Riser	0.65' AGS					5											
Top of Seal	42.5				Well Cap:												
Top or ocal					Grout Type: Bentonite								ł				
Top of Sand Pack	45.55				Well Key:			1	\vdash				l				-
Top of Salid Fack					Well Rey.	10							ł				
						<u> </u>							ł				
					Diagrapina, DVC												
					Riser Pipe: PVC												
													ł				
	45.55					15											
Top of Screen	10.00					15											_
													ļ				
					Sand/Gravel												
					Pack Size: #2 Sand	20										,	_
					Screen Size:												
						25										•	
						30											
]				
						35]				
													1				
Bottom of Screen	65.55	7						1					1				
Bottom of Boring	65.55	7						1					1				
Remarks:													1				
1						40							1				
L					Change in Strate		!	Ь	ш			in Ctro	<u> </u>				!

PROJECT NAME: PROJECT LOCATION: PROJECT LOCATION: New York BORING BY: AARCO DATE STARTED 11/13/20 DEVELOPMENT PERIOD INSIDE CASING DIAMETER (in) INSIDE CAS	MW-6 10737:6 2" 3.75" 45.7 P.I.D.
BORING BY: AARCO DATE STARTED 11/13/20 DEVELOPMENT PERIOD INSIDE CASING DIAMETER (in) INSPECTOR: John Norgard DATE COMPLETED 11/13/20 DEVELOPMENT METHOD Pump BOREHOLE DIAMETER (in) NJ DEP PERMIT NO.: DATE DEVELOPED 11/18/20 DEVELOPMENT RATE # gpm INITIAL WATER LEVEL (ft): WELL CONSTRUCTION 0/6 6/12 12/18 18/24 (in) Depth (feet below grade) Top of Casing: # Ground Surface 7 Top of Riser 0.77 AGS 5 GROUND ELEVATION: INSIDE CASING DIAMETER (in) BOREHOLE DIAMETER (in) DEVELOPMENT RATE # gpm INITIAL WATER LEVEL (ft): SOIL DESCRIPTION AND STRATIFICATION	2" 3.75" 45.7
BORING BY: AARCO DATE STARTED 11/13/20 DEVELOPMENT PERIOD INSIDE CASING DIAMETER (in) DEVELOPMENT METHOD Pump BOREHOLE DIAMETER (in) NJ DEP PERMIT NO.: DATE DEVELOPED 11/18/20 DEVELOPMENT METHOD Pump BOREHOLE DIAMETER (in) 11/18/20 DEVELOPMENT RATE # gpm INITIAL WATER LEVEL (ft): Blows on Spoon REC SOIL DESCRIPTION AND STRATIFICATION Depth (feet below grade) Top of Casing: Ground Surface Top of Riser 0.7' AGS AGS DATE STARTED 11/13/20 DEVELOPMENT PERIOD INSIDE CASING DIAMETER (in) Pump BOREHOLE DIAMETER (in) Pump BOREHOLE DIAMETER (in) Pump Blows on Spoon REC SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION SOIL DESCRIPTION AND STRATIFICATION	3.75" 45.7
NSPECTOR: John Norgard DATE COMPLETED 11/13/20 DEVELOPMENT METHOD Pump BOREHOLE DIAMETER (in)	3.75" 45.7
NJ DEP PERMIT NO.: DATE DEVELOPED	45.7
DEPTH (ft) Blows on Spoon REC SOIL DESCRIPTION AND STRATIFICATION	•
WELL CONSTRUCTION (ft)	P.I.D.
Depth (feet below grade) Top of Casing: # Ground Surface 0 Top of Riser 0.7' AGS 5	
Ground Surface Top of Riser AGS Casing Type:	
Top of Riser 0.7' AGS 5	
AGS 5	
Top of Seal	
Grout Type: Bentonite	
Top of Sand Pack 43.15' Well Key:	
10	
Riser Pipe: PVC	
Top of Screen 43.15	
Top of Screen 45.15	_
	<u> </u>
Sand/Gravel Sand Sand Sand Sand Sand Sand Sand Sand	<u> </u>
Pack Size: #2 Sand 20	
Screen Size:	
25	
30	
	_
	
	<u> </u>
	+
63.15	<u> </u>
Bottom of Screen 63.15	
Bottom of Boring 63.15	<u> </u>
Remarks:	
40	

		21		PROJE	ECT NAME:		39th S	treet, Br	ooklvn					MONIT	ORING WELL NO.		/IW-7
S	上	51			ECT LOCATION:		New Y		,					JOB N		+	737:6
CO	NSULT	ING		TROOL	201 200/11/014.		I tow I	OIK							ND ELEVATION:		7,01.0
BORING BY: AARCO		.1,0		DATE	STARTED		44/4	19/20	DEVEL	ODMEN	IT DED	IOD	· ·	GROU	INSIDE CASING DIAMETER (in	\	1"
													D		,)	
INSPECTOR: John N					COMPLETED		1	19/20	DEVEL				Pu		BOREHOLE DIAMETER (in)		1.75"
NJ DEP PERMIT NO).:			DATE	DEVELOPED		11/2	21/20	DEVEL	OPMEN	NT RATI	E	# g	pm	INITIAL WATER LEVEL (ft):		46.46
	WE	LL CON	STRUC	TION		DEPTH (ft) 0	Sample	0/6	Blows o	n Spoor 12/18	18/24	REC (in)		SOIL	DESCRIPTION AND STRATIFIC	ATION	P.I.D.
Depth (feet below	grade)																
Top of Casing:	#	[‡]			ì												
Ground Surface	(Casing Type:												
Top of Riser	0.95' AGS				Mall Oans	5											
Top of Seal	43				Well Cap:												
					Grout Type: Bentonite												
Top of Sand Pack	46.22	?			Well Key:												
						10							1				
													1			•	
					Riser Pipe: PVC								1				
					·								1				
Top of Screen	46.22					15							1				
Top or ocicen																•	
													ł				
					Sand/Gravel												
					Pack Size: #2 Sand	20											
					Pack Size. #2 Saliu	20										•	
													ł				
					0 0:												
					Screen Size:												
						0.5	<u> </u>						1				
						25	<u> </u>						I				_
							-										
						30											
						35											
																•	
Bottom of Screen	56.22	1]				
Bottom of Boring	56.22	1											[
Remarks:					1								1				
						40							1				
					Change in Strate						0000		<u> </u>				

	_				CT NAME.		2041- 04	brank Dr	a a leb m					MONUT	CODINO WELL NO	1 .	N4/ 0
S	F	31			ECT NAME:			treet, Br	оокіуп						ORING WELL NO.	+	IW-8
col	NSULT	NG		PROJE	ECT LOCATION:		New Y	ork						JOB N		10	737:6
	GINEE	RS										- 1		GROU	ND ELEVATION:	 	
BORING BY: AARCO					STARTED				DEVEL						INSIDE CASING DIAMETER (in)	2"
INSPECTOR: John No	orgard			DATE	COMPLETED		11/2	20/20	DEVEL	OPME1	NT MET	HOD	Pu	mp	BOREHOLE DIAMETER (in)		3.75"
NJ DEP PERMIT NO.	:			DATE	DEVELOPED		11/2	21/20	DEVEL	OPME	NT RAT	E	# g	pm	INITIAL WATER LEVEL (ft):		45.45
	WEL	L CON	STRUC	TION		DEPTH (ft) 0	Sample	0/6	Blows or	n Spoor 12/18	18/24	REC (in)		SOIL	DESCRIPTION AND STRATIFIC	ATION	P.I.D.
Depth (feet below g	rade)					0		0/0	0/12	12/10	10/24	(111)					
Top of Casing:	#	_			,												
Ground Surface	0				Casing Type:												
Top of Riser	0.5					5										-	
Top of Seal	43'				Well Cap:												
					Grout Type: Bentonite												
Top of Sand Pack	45.85'				Well Key:												
Top or Gariu Fack						10											-
																-	
					Riser Pipe: PVC												
					Risei Fipe. FVC												
	45.85'					45											
Top of Screen	10.00					15										-	
					Sand/Gravel												
					Pack Size: #2 Sand	20											
					Screen Size:												
						25										-	
1																	
						30										_	
																•	
						35											
																-	
Bottom of Screen	55.85'																
Bottom of Boring	55.85'			I													
Remarks:		<u> </u>			l												-
						40											
L					Change in Strata		ļ		Inferre								

APPENDIX B GROUNDWATER MONITORING WELL SAMPLING LOGS

Location:	39th Street, Brookl	yn, New York		Job Number:	10737:6	WELL I.D. : M	W-1		
Personnel:	Jack Norgard, Rac	hel Freeman		Date:	11/24/2020				
				PID:	0		CONSU	LTING EERS	
Stickup? Y 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
0.65	N/A	55.83	N/A	46.01	9.82	50.92	48		Bladder
Turbidity at co	ollection (NTU):	731	(Less than	1 5 NTU is desirable)	Dup	licate Collecte	d? N	Filtered Sam	iple N
Stabilizatio	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
				Water Quality N	leter Malfunction	n			
			18/	l ell Condition Summa	<u> </u>				
				en Condition Summa	ıry	I		I	
Cover: N/A		Bolts: N/A		Concrete Pad OK: N		Gripper: Y			
	T		Sam	ple Collection Inform	ation		_		
Sample Time:		Appearance: Cle		Filtered Sample Tur			OTHER:		
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations: Volume? Linear Ft of well casi	(slow drip) & turbidity <10 if possible. If t ng; 1"=0.041 gal. 2"= 0.163 ga		d untiltered samples. N	lotity PM of high turbidity and collecti	on of filtered samples prior to	o lab submittal.		Minimum 20 minute pu	rge to establish
				ABSORBENT SOCK					
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :	
	lation Date:		· · · · · · · · · · · · · · · · · · ·	Sock Cha	nged :	Y/N]	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
Sock Dept	h (Depth to sock mid p	oint):]		

Location:	39th Street, Brookly	yn, New York		Job Number:	10737:6	WELL I.D. : M	W-2		
Personnel:	Jack Norgard, Rac	hel Freeman		Date:	11/24/2020				
				PID:	0		CONSU	LTING	
Stickup? Y 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
0.65	N/A	49.32	N/A	46.7	2.62	48.01	48		Bladder
Turbidity at co	ollection (NTU):	731	(Less than	5 NTU is desirable)	Dup	licate Collected	i? N	Filtered Sam	ple N
Stabilization	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
				Water Quality M	leter Malfunction	1			
		•	w	ell Condition Summa	ry	1			
Cover: N/A		Bolts: N/A		Concrete Pad OK: N		Gripper: Y			
			Samı	ole Collection Inform	ation				
Sample Time:		Appearance: Cle		Filtered Sample Tur			OTHER:		
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations: Volume? Linear Ft of well casin	(slow drip) & turbidity <10 if possible. If the drip o		d unfiltered samples. N		on of filtered samples prior to	lab submittal.		Minimum 20 minute pur	rge to establish
			(21)	ABSORBENT SOCK			In		
Sock Length (ft) =	lation Date:	Capacity	(ut.) =	On all Object	Present:	Y/N	Product Measu	rea (inches) :	
	lation Date: h (Depth to sock mid p	oint):		Sock Cha	nged :	Y / N			
-	-								

Location:	39th Street, Brookly	yn, New York		Job Number:	10737:6	WELL I.D. : M	W-3		
Personnel:	Jack Norgard, Rac	hel Freeman		Date:	11/24/2020				
				PID:	0		CONSU	LTING	
Stickup? Y 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
0.65	N/A	60.11	N/A	45.11	15	52.61	50		Bladder
Turbidity at co	ollection (NTU):	731	(Less than	s NTU is desirable)	Dup	licate Collected	i? N	Filtered Sam	ple N
Stabilization	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
				Water Quality M	leter Malfunction	1			
			W	ell Condition Summa	ry				
Cover: N/A		Bolts: N/A		Concrete Pad OK: N		Gripper: Y			
		•	Samı	ple Collection Inform	ation		1		
Sample Time:		Appearance: Cle		Filtered Sample Tur			OTHER:		
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations: Volume? Linear Ft of well casin	(slow drip) & turbidity <10 if possible. If the drip o		d unfiltered samples. N		on of filltered samples prior to	o lab submittal.		Minimum 20 minute pur	rge to establish
		0	(01)	ABSORBENT SOCK			Dun dun Merri	and the sheets	
Sock Length (ft) =	leties Deter	Capacity	(Qt.) =	On all Object	Present:	Y/N	Product Measu	rea (incnes) :	
	lation Date: h (Depth to sock mid p	oint):		Sock Cha	nged :	Y/N			
						-			

Location:	39th Street, Brookl	yn, New York		Job Number:	10737:6	WELL I.D. : M	W-4		
Personnel:	Jack Norgard, Rac	hel Freeman		Date:	11/24/2020				
				PID:	0		CONSU	LTING EERS	
Stickup? Y 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
0.65	N/A	55.2	N/A	45.65	9.55	50.425	50		Bladder
Turbidity at co	ollection (NTU):	731	(Less than	n 5 NTU is desirable)	Dup	licate Collecte	d? N	Filtered Sam	iple N
Stabilizatio	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
				Water Quality N	leter Malfunction	ı	_		
							-		
			14/	l ell Condition Summa					
		ı	VV	en Condition Summa	ıry	I		ı	
Cover: N/A		Bolts: N/A		Concrete Pad OK: N		Gripper: Y			
	Т	1	Sam	ple Collection Inform	ation		_		
Sample Time:		Appearance: Cle		Filtered Sample Tur			OTHER:		
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations: Volume? Linear Ft of well casi	(slow drip) & turbidity <10 if possible. If t ng; 1"=0.041 gal. 2"= 0.163 ga		id untiltered samples. N	lotity PM of high turbidity and collecti	on of filtered samples prior to	o lab submittal.		Minimum 20 minute pu	rge to establish
				ABSORBENT SOCK					
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :	
	lation Date:		· · · · · · · · · · · · · · · · · · ·	Sock Cha	nged :	Y/N]	<u> </u>	· · · · · · · · · · · · · · · · · · ·
Sock Dept	h (Depth to sock mid p	oint):]		

Location:	39th Street, Brookl		LOW C	Job Number:		WELL I.D. : N	W-5		
Personnel:			TI CONTRACTOR OF THE CONTRACTO	Date:		WELL I.D II		100	
. 0.00	g ,		•	PID:	0		SE	5	
Stickup? Y 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
0.65	N/A	65.55	N/A	45.17	20.38	55.36	58		Bladder
Turbidity at c	ollection (NTU):	731	(Less than	5 NTU is desirable)	Dupi	licate Collecte	d? N	Filtered Sam	ple N
Stabilizatio	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
	11:15	28.02	7.26	0	9.37	183	248	44.16	N
	11:35 11:40	22.01 21.99	7.11 7.12	0.896 0.898	0	152 151	910 853	44.2 44.18	N N
	11:45	21.94	7.11	0.901	Ö	149	731	44.19	N
			We	ell Condition Summ	ary	ı			
Cover: N/A		Bolts: N/A		Concrete Pad OK:		Gripper: Y			
Sample Time:	11:50	Appearance: CI		Filtered Sample Tu			OTHER:		
Desired purge flow rate <100mL/m establish stabilization. Notes/ Calculations:	in (slow drip) & turbidity <10 if possible sing; 1*=0.041 gal. 2*= 0.16;	s. If turbidity > 10 collect filte	red and unfiltered sam	ples. Notify PM of high turbidity as	nd collection of filtered samp	oles prior to lab submitta		Minimur	n 20 minute purge to
Sock Length (ft) =		Capacity		ABSORBENT SOCE	Present:	Y/N	Product Measu	red (Inches)	
	llation Date:	Capacity	(41.) -	Sock Cha		Y/N	. Judot measu	04 (11101103)	
	h (Depth to sock mid)	point):		- COOK CITE			1		
		,							

Location:	39th Street, Brook	Job Number: 10737:6 WELL I.D. : MW-6							
Personnel: Jack Norgard, Rachel Freeman			1	Date: 11/20/2020			P. P.	100	
			li .			525			
				PID: 0		ECHSUL PAG			
Stickup? Y	Distance From Rim	Total Depth of	Depth to	Depth to Water	Standing	Middle of	Depth to	TOV @ Well	Pump
Distance ground to	to PVC	Well Rim/PVC	Product	(Rim/PVC)	Water Column	Saturated	Sample Tube	Head	Peristaltic
Stickup Rim/PVC	10170	Well Rilling VO	Rim/PVC	(1411111 10)	(feet)	Zone (feet)	(feet)	(ppmv)	or Bladder
0.7	N/A	63.15	N/A	45.17	17.98	54.16	55		Bladder
Turbidity at c	ollection (NTU):	500	(Less than	5 NTU is desirable)	Dup	licate Collecte	d? Y	Filtered Sam	nple N
Stabilizatio	n 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
				Foodamino	ļ			desirable	
Volume Purged	Time (actual Time)	TEMP.		Specific	Dissolved	ORP	Turbidity	DTW	Odors
(gallons)	5 minute Intervals	(Deg. C)	pН	Conductivity uS/cm	Oxygen (mg/L)	mV millivolts	NTUs	(feet)	Y/N
	8:55	9.12	7.15	1.27	1.44	176	0	45.17	N
	9:05	20	7	1.25	0.74	178	931	45.21	N
	9:10	20.23	6.98	1.25	0.51	178	942	45.21	N
	9:15	20.33	7.02	1.25	0	176	720	45.21	N
	9:20	20.41	6.98	1.25	0	176	608	45.22	N
	9:25	20.51	6.96	1.25	0	176	500	45.22	N
	-								
							-		
	-								
	•		W	ell Condition Summ	ary				•
Cover: N/A		Bolts: N/A		Concrete Pad OK:		Gripper: Y			
	•		Sam	ole Collection Inforn	nation	•			
Sample Time:	9:30	Appearance: CI					OTHER:		
establish stabilization. Notes/ Calculations:	in (slow drip) & turbidity <10 if possible sing; 1"=0.041 gal. 2"= 0.16					oles prior to lab submittal		Minimur	n 20 minute purge to
				ABSORBENT SOCH			_		
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :	
	llation Date:			Sock Cha	inged :	Y/N			
Sock Dept	h (Depth to sock mid p	point):	·	•	•	•]		
	·			·			1		

Location:	39th Street, Brookl	yn, New York		Job Number:	10737:6	WELL I.D. : M	W-7			
Personnel:	Jack Norgard, Rac	hel Freeman		Date:	11/24/2020	OFO				
				PID:	0		CONSU	LTING EERS		
Stickup? Y 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	
0.65	N/A	56.22	N/A	46.46	9.76	51.34	50		Bladder	
Turbidity at co	ollection (NTU):	731	(Less than 5 NTU is desirable)		Duplicate Collected? N			Filtered Sample N		
Stabilization	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N	
				Water Quality N	leter Malfunction	ı				
							1			
			14/	l ell Condition Summa						
		ı	VV	en Condition Summa	ıry	I		I		
Cover: N/A		Bolts: N/A		Concrete Pad OK: N		Gripper: Y				
	Т	1	Sam	ple Collection Inform	ation		1			
Sample Time:	Appearance: Clear			Filtered Sample Turbidity:			OTHER:			
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations: Volume? Linear Ft of well casi	(slow drip) & turbidity <10 if possible. If t ng; 1"=0.041 gal. 2"= 0.163 ga		id untiltered samples. N	lotity PM of high turbidity and collecti	on of filtered samples prior to	o lab submittal.		Minimum 20 minute pu	rge to establish	
				ABSORBENT SOCK						
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :		
	lation Date:		· · · · · · · · · · · · · · · · · · ·	Sock Cha	nged :	Y/N]	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
Sock Dept	h (Depth to sock mid p	oint):								

Location:	39th Street, Brookl	yn, New York		Job Number:	10737:6	WELL I.D. : M	W-8		
Personnel:	Jack Norgard, Rac	hel Freeman	•	Date:	11/24/2020	CECI			
				PID:	0		CONSU	LTING EERS	
Stickup? Y 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
0.65	N/A	55.85	N/A	45.45	10.4	50.65	50		Bladder
Turbidity at co	ollection (NTU):	731	(Less than 5 NTU is desirable)		Dup	licate Collected	d? N Filtered Sar		nple N
Stabilization	n 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N
				Water Quality M	leter Malfunction	1			
			w	ell Condition Summa	ry				
Cover: N/A		Bolts: N/A		Concrete Pad OK: N	/A	Gripper: Y			
			Sam	ple Collection Inform	ation				
Sample Time:		Appearance: Cle		Filtered Sample Turbidity:			OTHER:		
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations: Volume? Linear Ft of well casir	(slow drip) & turbidity <10 if possible. If the drip if 1 = 0.041 gal. 2"= 0.163 gal.	urbidity > 10 collect filtered and and al. 4"=0.653 gal.	nd unfiltered samples. N		on of filtered samples prior to	o lab submittal.		Minimum 20 minute pu	irge to establish
0		0	(Ot) =	ABSORBENT SOCK	5	N/N	Draduat Mass	wad (Inaba-) :	ı
Sock Length (ft) =	lation Date:	Capacity	(હાર.) =	Sock Cha	Present:	Y/N	Product Measu	rea (inches) :	
	h (Depth to sock mid p	oint):		SOCK Cha	iiged :	Y/N	<u> </u>		
L							1		

Location:	39th Street, Brookly	vn New York	LOW-I LOW	Job Number:	WELL I.D. : M	W_1				
Personnel:				Job Number: 10737:9 WELL I.I			. I.D (MVV-1			
Personner.	Kacherrie	eman	1	PID:	0		CONSU			
Stickup? Y 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	
0.65	N/A	50.1	N/A	46.6	3.5	48.35			Bladder	
Turbidity at co	ollection (NTU):	130	(Less than	n 5 NTU is desirable)	Dup	licate Collected	1? N	Filtered Sample N		
Stabilization	Stabilization Parameters		+/- 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N	
	11:00	13.69	6.57	1.01	10.3	313	187	46.6	N	
	11:05	12.99	6.44	1.81	10.2	300	500		N	
	11:10	13.64	6.33	1.93	10.45	280	510		N	
	11:15 11:20	13.8 13.97	5.5 5.22	1.01 1.01	10.5 10.62	275 273	190 191		N N	
			W	ell Condition Summa	ıry	1		1		
Cover: N/A		Bolts: N/A	Sam	Concrete Pad OK: N/A Gripper Sample Collection Information		Gripper: Y	ripper: Y			
Sample Time:	Sample Time: 11:25 Appearance: Cl			Filtered Sample Tur			OTHER:			
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations:	(slow drip) & turbidity <10 if possible. If t ng; 1"=0.041 gal. 2"= 0.163 ga	urbidity > 10 collect filtered an		Lotify PM of high turbidity and collecti		o lab submittal.		Minimum 20 minute pu	rge to establish	
				ABSORBENT SOCK			T=			
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :		
	llation Date: h (Depth to sock mid p	oint):		Sock Cha	nged :	Y/N				
							<u> </u>			

Location:	30th Stroot Brookl	un Now York	2011 1 2011	Job Number:	WELL I.D. : M	W_2				
Personnel:	, , ,			Job Number: 10737:9 WELL I.D. : N			VV-2			
Personner.	Nacilei Fie	eman	•	PID:	0		CONSU			
Stickup? Y 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	
0.65	N/A	50	N/A	46.5	3.5	48.25	, , ,		Bladder	
Turbidity at co	ollection (NTU):	130	(Less than	n 5 NTU is desirable)	Dup	licate Collected	d? N	Filtered Sample N		
Stabilization	Stabilization Parameters		+/- 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)	рН	Specific Conductivity uS/cm	Dissolved Oxygen (mg/L)	ORP mV millivolts	Turbidity NTUs	DTW (feet)	Odors Y/N	
	9:50	10.6	6.49	2	5.29	220	800	46.5	N	
	9:55	10.7	6.79	1.91	5.29	227	800		N	
	10:00	12.1	6.92	1.66	4.77	252	492		N	
	10:05	12.76	6.95	1.83	4.15	259	185		N	
	10:10	12.44	6.96	1.83	4.41	264	129		N	
	10:15	12.12	6.96	1.84	4.3	272	130		N	
			W	ell Condition Summa	iry	1		_		
Cover: N/A		Bolts: N/A	Sam	Concrete Pad OK: N/A Gripper: Sample Collection Information			per: Y			
Sample Time:	Sample Time: 10:15 Appearance: CI			Filtered Sample Tur			OTHER:			
Desired purge flow rate <100mL/min stabilization. Notes/ Calculations:	(slow drip) & turbidity <10 if possible. If the sign o	urbidity > 10 collect filtered an				o lab submittal.	<u> </u>	Minimum 20 minute pu	irge to establish	
				ABSORBENT SOCK						
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :		
	lation Date: h (Depth to sock mid p	oint):		Sock Cha	nged :	Y/N				

Location:	39th Street, Brookly	vn New York	Job Number: 10737:9 WELL I.D. : MW-3							
Personnel:	, , ,			Date: 3/23/2021						
Personner.	Racilei Fie	eman	Ī	Date.	3/23/2021		SE	S		
				PID:	0		CONSU	LTING		
Stickup? Y	Distance From Rim to	Total Depth of	Depth to	Depth to Water	Standing	Middle of	Depth to	TOV @ Well	Pump	
Distance ground to		•	Product		Water Column	Saturated	Sample Tube	_	Peristaltic or	
Stickup Rim/PVC	PVC	Well Rim/PVC	Rim/PVC	(Rim/PVC)	(feet)	Zone (feet)	(feet)	Head (ppmv)	Bladder	
0.65	N/A	59.6	N/A	44.33	15.27	51.965			Bladder	
Turbidity at c	ollection (NTU):	519	(Less than	n 5 NTU is desirable)	Dup	licate Collected	d? N	Filtered Sam	Filtered Sample N	
Stabilizatio	Stabilization Parameters		+/- 0.1 Unit	+/- 10 umhos/cm or within 3% if >300umho	1 ppm	+/- 10 mV	No Limit	<.3 feet drawdown desirable	No Limit	
	1			Cassifia	Dissolved	ORP			1	
Volume Purged	Time (actual Time)	TEMP.		Specific		_	Turbidity	DTW	Odors	
(gallons)	5 minute Intervals	(Deg. C)	pН	Conductivity	Oxygen	mV	NTUs	(feet)	Y/N	
(9)				uS/cm	(mg/L)	millivolts		` '		
	9:30	13.79	6.47	1.58	11.17	313	0	44.33	N	
	9:35	15.83	7.13	1.51	10.78	314	0		N	
	9:40	16.11	7.23	1.44	11.53	315	800		N	
	9:45	15.92	7.28	1.51	10.9	317	763		N	
	9:50	16	7.17	1.52	11.37	325	573		N	
	9:55	15.9	7.38	1.52	11.17	315	667		N	
	10:00	16.16	7.28	1.46	10.65	320	519		N	
			w	ell Condition Summa	rv					
					•					
Cover: N/A		Bolts: N/A		Concrete Pad OK: N		Gripper: Y	Gripper: Y			
			Sam	ple Collection Inform	ation		1			
Sample Time:	10:00 (slow drip) & turbidity <10 if possible. If t	Appearance: Cle		Filtered Sample Turk		Lab as described	OTHER:			
stabilization. Notes/ Calculations:	(slow drip) & turbidity <10 if possible. If t ing; 1"=0.041 gal. 2"= 0.163 ga		iu unillerea samples. N	oury Fivi of nigh turbidity and collecti	on or intered samples prior to	o iau sudmillaii.		Minimum 20 minute pu	irge i∂ establish	
	5			ABSORBENT SOCK						
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :		
	llation Date:		. ,	Sock Char		Y/N		. ,		
	h (Depth to sock mid p	oint):			-]			

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	39th Street, Brookly	un Now York	LOW-I LOW	Job Number:	10737:9	WELL I.D. : M	W_7		
Personnel:	Rachel Fre		•	Date:	3/23/2021	***EEE 1.D IVI			
Personner.	Racilei Fie	eman	Ī	Date.	3/23/2021		SE	S	
				PID:	0		CONSU	LTING	
Stickup? Y	Distance From Rim to	Total Depth of	Depth to	Depth to Water	Standing	Middle of	Depth to	TOV @ Well	Pump
Distance ground to	PVC	Well Rim/PVC	Product	(Rim/PVC)	Water Column	Saturated	Sample Tube	_	Peristaltic or
Stickup Rim/PVC	PVC	Well Rim/PVC	Rim/PVC	(RIM/PVC)	(feet)	Zone (feet)	(feet)	Head (ppmv)	Bladder
0.65	N/A	49.2	N/A	45.14	4.06	47.17			Bladder
Turbidity at co	ollection (NTU):	519	(Less than	n 5 NTU is desirable)	Dup	licate Collected	1? N	Filtered Sam	iple N
Stabilizatio	n 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
			ı	Cnasifia	Dissolved	ORP	1	1	ı
Volume Purged	Time (actual Time)	TEMP.		Specific		_	Turbidity	DTW	Odors
(gallons)	5 minute Intervals	(Deg. C)	pН	Conductivity uS/cm	Oxygen	mV	NTUs	(feet)	Y/N
	10:55	16.88	7.35	u5/cm 1	(mg/L) 10.81	millivolts 294	0	45.14	N
	11:00	16.37	7.17	1.55	10.88	152	0	45.14	N N
	11:05	16.44	7.45	1.86	10.59	139	0		N
	11:10	17.01	6.3	1.86	10.87	130	0		N
	11:15	16.42	6.5	1.77	10.74	136	0		N
	11:20	16.53	6.64	1.71	10.7	137	0		N
							-		
			W	ell Condition Summa	ry				
Cover: N/A		Bolts: N/A		Concrete Pad OK: N	/A	Gripper: Y			
			Sam	ple Collection Inform	ation	•	1	•	
Sample Time:	11:20	Appearance: Cle		Filtered Sample Turk			OTHER:		
stabilization. Notes/ Calculations:	(slow drip) & turbidity <10 if possible. If t ng; 1"=0.041 gal. 2"= 0.163 ga		nd unfiltered samples. N	lotify PM of high turbidity and collection	on of filtered samples prior to	o lab submittal.		Minimum 20 minute pu	rge to establish
	J			ABSORBENT SOCK					
Sock Length (ft) =		Capacity	(Qt.) =		Present:	Y/N	Product Measu	red (Inches) :	
	llation Date:		. ,	Sock Char		Y/N		. ,	
Sock Dept	h (Depth to sock mid p	oint):		•	_	•]		

LOW-FLOW GROUNDWATER SAMPLING LOG

Location:	39th Street, Brookly	n Now York	2011 1 2011	Job Number:	10737:9	WELL I.D. : M	W_8		
Personnel:	Rachel Fre	, ,	i	Date:	3/19/2021	WELL I.D IVI	VV-0		
Personnei:	Racilei Fre	eman	1	Date:	3/19/2021		SE		
				PID:	0		CONSU	LTING	
				1 15.	·		ENGIN	EERS	
Stickup? Y	Dietanas Eram Dim to	Total Donth of	Depth to	Donth to Water	Standing	Middle of	Depth to	TOV @ Well	Pump
Distance ground to	Distance From Rim to	Total Depth of	Product	Depth to Water	Water Column	Saturated	Sample Tube	_	Peristaltic or
Stickup Rim/PVC	PVC	Well Rim/PVC	Rim/PVC	(Rim/PVC)	(feet)	Zone (feet)	(feet)	Head (ppmv)	Bladder
0.65	N/A	55.5	N/A	45.25	10.25	50.375			Bladder
Turbidity at co	ollection (NTU):	184	(Less than	5 NTU is desirable)	Dup	licate Collected	1? N	Filtered Sam	iple N
				+/- 10 umhos/cm or				<.3 feet	
Stabilization	n Parameters	+/- 0.5 deg C.	+/- 0.1 Unit	within 3% if	1 ppm	+/- 10 mV	No Limit	drawdown	No Limit
				>300umho				desirable	
						•	•	•	•
Volume Purged	Time (actual Time)	TEMP.		Specific	Dissolved	ORP	Turbidity	DTW	Odors
(gallons)	5 minute Intervals	(Deg. C)	pН	Conductivity	Oxygen	mV	NTUs	(feet)	Y/N
(gallolis)	J minute miter vars	(Deg. C)		uS/cm	(mg/L)	millivolts	NIOS	` '	171
	08:45	9.35	6.45	1.03	8.98	287	181	45.25	N
	08:50	9.36	6.57	1.1	9	311	200		N
	08:55	8.42	6.77	1.12	8.5	252	150		N
	09:00	8.22	6.57	1.02	8.01	260	222		N
	09:05	8.01	6.67	0.02	7.94	240	202		N
	09:10	7.78	6.69	0.02	7.75	242	180		N
	09:15	7.7	6.69	0.02	7.72	239	184		N
								-	
								-	
								-	
			W	ell Condition Summa	ry	ı	1	1	ı
Cover: N/A		Bolts: N/A		Concrete Pad OK: N	/A	Gripper: Y			
			Sam	ple Collection Inform	ation	ı			
Sample Time:	9:15	Appearance: Mu	ddy	Filtered Sample Turl	bidity:		OTHER:		
stabilization. Notes/ Calculations:	(slow drip) & turbidity <10 if possible. If t		nd unfiltered samples. N	otify PM of high turbidity and collection	on of filtered samples prior to	o lab submittal.		Minimum 20 minute pu	rge to establish
Volume? Linear Ft of well casi	ng; 1"=0.041 gal. 2"= 0.163 ga	al. 4"=0.653 gal.		ADOODDENT OCCU					
Sock Longth (ft) -		Capacity	(Ot) =	ABSORBENT SOCK	Drocont:	Y/N	Product Measu	ırad (Inchee) ·	l
Sock Length (ft) =	lation Date:	Capacity	(QL.) -	Sock Cha	Present:		FIOUUCI Weast	neu (munes) :	
	h (Depth to sock mid p	oint):		JUCK Cliai	ngeu .	Y/N	1		
эоск Бері	ii (Dehiii io sock iiila þ	omitj.					1		
							L		

APPENDIX C CITIZENS PARTICIPATION PLAN



Brownfield Cleanup Program

Citizen Participation Plan for 1440-1460 39th Street

September 2020

C224311 1440 39th Street, 1446 39th Street, 1456-1460 39th Street and 40th Street Brooklyn, NY 11218

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* * * * *

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: SnL XXII, LLC

Site Name: 1440-1460 39th Street Site

Site Address: 1440 39th Street, 1446 39th Street, 1456-1460 39th Street & 40th Street

Site County: **Kings County**Site Number: **C224311**

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 Complete	s 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.			

Citizen Participation Activities	Timing of CP Activity(ies)
Before Applicant Sta	rts Cleanup Action:
Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Compl	etes 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	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.
Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (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. Therefore, once the 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 (HASP) and Soil Management Plan (SMP) approved by the Department, which will be designed to minimize these impacts. A Community Air Monitoring Plan (CAMP) will also be implemented to monitor dust and vapors to ensure the community is not impacted. CAMP implementation involves the placement of air monitoring stations downwind of where work is occurring to capture both dust and vapor emissions. If dust or emissions exceed a set threshold established by NYSDEC and the New York State Department of Health (NYSDOH), then work must cease and the cause of the issue must be corrected before work can proceed.

The site is located in an Environmental Justice Area. Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

The site includes a community with a sizable Asian-American population, therefore, all future fact sheets will be translated into Hindi and Bangladeshi..

For additional information, visit: https://popfactfinder.planning.nyc.gov/profile/5997/demographic

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

- Location: 1440 39th Street, 1446 39th Street, 1456-1460 39th Street and 40th Street, Brooklyn, Kings County
- Setting Urban

- Site size 0.574 Acres
- adjacent properties Residential, Commercial & Industrial

History of Site Use, Investigation, and Cleanup

Several prior historical use reports, called Phase I reports, have been performed on the Site, which all consistently revealed the site was historically utilized for by a black car company for automotive repair and as a garages for the vehicles as well as a matzoh/noodles factory and a live poultry storage facility. The current and historical uses of adjoining properties included: auto garages, manufacturing (i.e., knitting mill, woodworking, and refrigerator manufacturing), warehouse, motor vehicle maintenance, and commercial uses to the north; residential to the south; manufacturing to the east; and, auto garage and repair and warehouse uses to the west.

The building located at 1440 39th Street was constructed as early as 1924. According to a certificate of occupancy issued in 1924, that building was used as a public garage. In 1929, another certificate of occupancy was issued for use as a "repair shop for automobiles." Green Young Garage Corp., Jacobson Garage Inc., Moody Motor Sales, and then finally in 1951, Acierno Garage Corp. was formed, with its address at 1440 39th Street. The Acierno family operated a black car service out of this building until the site was recently sold to the current volunteer but its operation had been severely curtailed over the last five years due to other car transport services including Uber and Lyft. Petroleum related Underground Storage Tanks (USTs) are present on the Site formerly used by these businesses.

The building on the Site located at 1446 39th Street was constructed as early as 1962 when it was occupied by Majestic Kosher Inc. for manufacturing Certified Sanborn Maps show the building was used for Live Poultry Storage until at least 1977. This use was likely in connection with the adjacent building at 1456 39th Street, historically operated by Majestic Live Poultry Co. Inc. Following the use of live poultry storage, the building at 1446 39th Street was used as offices and warehouse space by Rands Casing Corp., Ten Dollar Carpet Store, Inc., Continental Flooring, Inc., A&M Income Tax Consultants, Inc., Chance Enterprise Corp., Pearland Brokerage, Inc., and the current operator, Executive Charge, Inc., which manages Executive Transportation Group.

The building on the Site located at 1456 39th Street was constructed as early as 1924 when, according to the Certificate of Occupancy issued that year, it was operated as a public garage. As early as 1934, the building at 1456 39th Street was occupied by Majestic Live Poultry Co. Inc. for storage of live poultry, and then was later used as a facility for making matzoh and noodles. As early as 1970, that building was converted into an auto repair shop, for which a certificate of occupancy was issued to Andor Auto, Inc., DBA: Andor Auto Repair, for the use of "Automobile repairs, body and fender repairs,

welding and spraying, automobile sales of used cars." This use, namely automobile repair and spraying paint is consistent with the high levels of petroleum and lead found on this portion of the site. As early as 1985, and until 1997, VA Sanitation Inc., a waste management company, operated the auto repair garage presumably to maintain and repair vehicles in its fleet of garbage trucks. From 1998 to 2002, Global Hamish Express Corp, a cargo and freight company, operated the auto repair shop presumably to maintain and repair vehicles in its fleet of delivery trucks. From 2003 to 2016, Chance Enterprise Corp. operated in the building as a used car dealer and repair shop. There are floor drains within the warehouse of this building which discharge into the ground. However, the estimated the depth of the groundwater under the Site is at approximately 45 feet below ground surface (bgs), and groundwater flow direction is expected to be in the southwest direction.

Two subsurface environmental investigations, called Phase II investigation, have been conducted to begin to determine the nature and extent of contamination on the Site. The first investigation included 31 soil borings and 32 soil samples collected. In addition, 4 soil vapor samples were collected, and one groundwater well was installed down to 40 feet, which did not reach the groundwater table. Finally, 10 composite soil samples were taken for off-site waste characterization purposes, 6 of which were composited at 4 foot intervals per boring down to 24 feet bgs, and 4 of which were composited down over 12 foot intervals per boring down to 24 feet bgs. Based on the investigations conducted to date, the primary contaminants of concern are semi-volatile compounds (SVOCs) typically from ash and coal in historic fill soils and petroleum-related SVOCs and heavy metals in soil exceeding commercial cleanup levels. There were no soil vapor exceedances of the NYSDOH or the USEPA guidance values detected in the 4 soil probes to date.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer which means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for commercial purposes but the applicant may achieve a higher level cleanup than a restricted commercial cleanup.

In order to achieve this goal and to expedite the implementation of the work, a Remedial Investigation Work Plan has been prepared and was submitted with the application and has been through a 30-day public comment period. In addition to certain site preparation activities, including demolition and support of excavation installation, the first step in the RIWP is to perform a UST removal Interim Remedial Measure (IRM) for the main purpose of being able to complete the investigation under the approximately 8 USTs that may be present under the Site. Thereafter, in order to further evaluate the soils after the tanks are removed, fourteen (14) soil borings will be performed on the Site in an approximate 40-foot grid pattern to evaluate and delineate soil contamination from historical operations, USTs, and other potential sources. In addition, waste characterization samples will also be collected from the borings for disposal approval. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site with oversight provided by NYSDEC.

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 has developed a remedial investigation workplan, which was subject to public comment from July 7, 2020 to August 7, 2020.

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.

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. As noted above, the IRM planned for this site was UST removal. Since this IRM was part of the RIWP, it was publicly noticed during the 30-day public comment period that ran from July 7 through August 7, 2020. However, interested members of the public can provide comments to the Department on any aspect of the investigation or remediation at any time.

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):

Steven Walsh
Project Manager
NYSDEC
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
steven.walsh@dec.ny.gov
518-402-9824

New York State Department of Health (NYSDOH):

Runey Ghosh
Project Manager
NYSDOH
Empire State Plaza
Corning Tower Room 1787
Albany, NY 12237
beei@health.ny.gov
518-402-7860

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Brooklyn Public Library
Borough Park Branch
1265 43rd Street
Brooklyn, NY 11219
Lina Ding, Branch Manger

Brooklyn Community Board No. 12 5910 13th Avenue

Brooklyn, NY 11219
Barry Spitzer, District Manager
Yidel Perlstein, Chairman
Environmental Committee Chairman
Repositories are temporarily unavailable
due to COVID-19 precautions. You can
get information about this Site at

https://www.dec.ny.gov/cfmx/extapps/dere

xternal/index.cfm/C224311.

If you cannot access the online repository at https://gisservices.dec.ny.gov/gis/dil/, and specifically the link to the documents in relation to this site at https://www.dec.ny.gov/data/DecDocs/C3 60186/ please contact the NYSDEC

project manager listed above for assistance. Type in the site address when accessing this website and then click on DEC Information Layers link. In this link, click "Environmental Cleanup" and check all the boxes. Then zoom in to see the documents of this site.

Appendix B - Site Contact List

	Federal and State Officials	
Hon. Chuck E. Schumer	Hon, Kirsten Gillibrand	Hon. Jerrold Nadler
U.S. Senate	U.S. Senate	U.S. House of
780 Third Avenue, Suite	780 Third Avenue, Suite	Representatives- 10th
2301	2601	District
New York, NY 10017	New York, NY 10017	6605 Fort Hamilton
THEW TOIK, INT TOOT?	14CW 16IK, 141 16617	Parkway
		Brooklyn, NY 11219
Hon. Simcha Felder	Nancy T. Sunshine	Hon. Eric Adams
New York State Senator-	Kings County Clerk	Kings County Executive
17th District	360 Adams Street, Room	(Borough President)
1412 Avenue J, Suite 2E	189	209 Joralemon Street
Brooklyn, NY 11230	Brooklyn, NY 11201	Brooklyn, NY 11201
BIOOKIYII, INT. 11230	BIOOKIYII, INT. 11201	Brooklyn, NT 11201
Marisa Lago	Hon. Bill de Blasio	Andrea Hagelgans
Chairperson, NYC	Mayor of New York City	Strategic Planning Advisor,
Planning Commission	City Hall	New York City
16 Court Street, 7th Floor	New York, NY 10007	City Hall
Brooklyn, NY 11241-0103		New York, NY 10007
Julie Stein	Hon. Juumane Williams	Hon. Scott Stringer
Office of Environmental	Public Advocate	NYC Comptroller
Assessment & Planning	1 Centre Street	1 Centre Street
96-05 Horace Harding	New York, NY 10007	New York, NY 10007
Expressway	,	,
Flushing, NY 11373		
J		
Mark McIntyre, Director	Hon. Brad Lander	Hon. Robert C. Carroll
NYC Office of	NYC Councilwoman	NYS Assemblyman
Environmental	456 5th Avenue	416 Seventh Avenue
Remediation	Brooklyn, NY 11215	Brooklyn, NY 11215
100 Gold Street - 2nd		
Floor		
New York, NY 10038		
·		

	Media Outlets	
New York Daily News Media Outlet 4 New York Plaza New York, NY 10004	New York Post 1211 Avenue of the Americas New York, NY 10036	Spectrum NY 1 News 75 Ninth Avenue New York, NY 10011
India Abroad 42 Broadway Suite #1836 New York, NY 10004	Bangla Weekly Parichoy 72-32 Broadway, Suite 404 Jackson Heights, NY 11372	The Brooklyn Papers 1 Metrotech Center, Suite 1001 Brooklyn, NY 11201
Courier-Life Publications 1 Metrotech Center #10T Brooklyn, NY 11201	Brooklyn Daily Eagle 16 Court Street, 30th Floor Brooklyn, NY 11241	
	Public Water Supplier	
Vincent Sapienza New York City Department of Environmental Protection 59-17 Junction Blvd. Flushing, NY 11373	Alfonso Carney Chair of New York City Water Board 59-17 Junction Blvd., 8th Floor Flushing, NY 11373	
	Schools and Daycare	
Erica Steinberg Principal of P.S. 164 Caesar Rodney 4211 14th Avenue Brooklyn, NY 11219 Administrator Yeshiva Kehilath Yakov Inc (Early Childhood Center) 1402 40th Street Brooklyn, NY 11218	Bernel Connelly Principal of P.S. 179 Kensington 202 Avenue C Brooklyn, NY 11218 Administrator Yeled V'Yalda (Early Childhood Center) 1312 38th Street Brooklyn, NY 11218	Andrew Frank Principal of J.H.S. 223 The Montauk 4200 16 Avenue Brooklyn, NY 11219 BAbove 43 (Daycare) 1373 43 STREET Brooklyn, NY 11219

	T	T
Yeled V' Yalda 1377 42 Street Brooklyn, NY 11219	YELED V'YALDA GAN YSROEL HEAD START Site 2 (15th St) 3909 15 Avenue Brooklyn, NY 11218	YESHIVATH KEHILATH YAKOV INC. 1402 40 Street Brooklyn, NY 11218
LITTLE MUNCHKINS 42 INC. 1411 41 Street Brooklyn, NY 11218	YELED V'YALDA EARLY CHILDHOOD CENTER, INC. 1377 42 St Brooklyn, NY 11219	BAbove 40 1325 38 Street Brooklyn, NY 11218
	Adjacent Property Owners	
Acierno Realty Corp Adjacent Property Owner of 1428 39th Street 1428 39th Street Brooklyn, NY 11219	Leva Realty LLC Adjacent Property Owner of 1431 39th Street 1431 39th Street Brooklyn, NY 11219	B & T Sales & Repair Shop Adjacent Property Operator of 1435 39th Street 1435 39th Street Brooklyn, NY 11219
Down Car Auto Repair Adjacent Property Operator of 1437 39th Street 1437 39th Street Brooklyn, NY 11219	Leva Realty LLC Adjacent Property Owner of 1433 39th Street 1433 39th Street Brooklyn, NY 11219	Executive Transportation Group Adjacent Property Operator of 1440 39th Street 1440 39th Street Brooklyn, NY 11219
Pearland Brokerage Inc Adjacent Property Operator of 1446 39th Street 1446 39th Street Brooklyn, NY 11219	Bais Tziporah Inc Adjacent Property Owner of 1449 39th Street 1449 39th Street Brooklyn, NY 11219	Claph LLC Adjacent Property Owner of 1451 39th Street 1451 39th Street Brooklyn, NY 11219
Chance Enterprise Corp. Adjacent Property Operator of 1456 39th Street 1456 39th Street Brooklyn, Ny 11219 28th Street Properties	ZLT Realty Corp Adjacent Property Owner of 1461 39th Street 1461 39th Street Brooklyn, Ny 11219 Dependable Collision	Harmony Services Inc Adjacent Property Operator of 1467 39th Street 1467 39th Street Brooklyn, NY 11219 KCM Therapy
Adjacent Property Owner of 1469 39th Street		

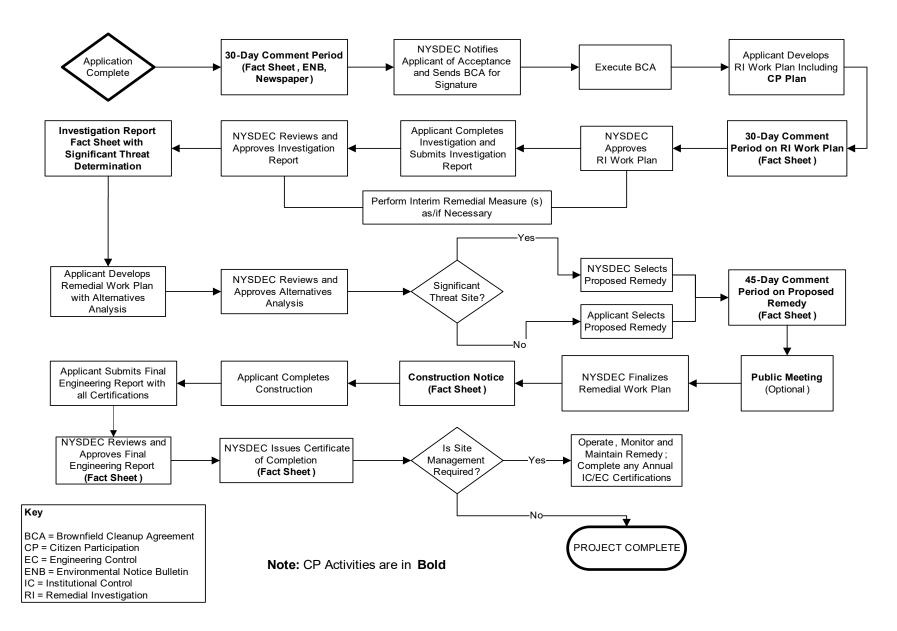
1469 39th Street	Adjacent Property	Adjacent Property
Brooklyn, NY 11219	Operator of 1469 39th	Operator of 1470 39th
	Street	Street
	1469 39th Street	1470 39th Street
	Brooklyn, NY 11219	Brooklyn, NY 11219
Dependable Collision	1470 39th Street LLC	Hanna Leah Greenzweig
Adjacent Property	Adjacent Property Owner	Adjacent Property Owner
Operator of 1437 39th	of 1462 39th Street	of 1465 40th Street
Street	1462 39th Street	1465 40th Street
1437 39th Street	Brooklyn, NY 11219	Brooklyn, NY 11219
	BIOOKIYII, INT 11219	BIOOKIYII, INT. 11219
Brooklyn,, NY 11219 Margaret Hershowitz	Revina Singer	Agnes Kilinger, as Trust
Adjacent Property Owner	Adjacent Property Owner	Agnes Kilinger, as Trust Adjacent Property Owner
of 1463 40th Street	of 1461 40th Street	of 1459 40th Street
1463 40th Street	1461 40th Street	1459 40th Street
Brooklyn, NY 11219	Brooklyn, NY 11219	Brooklyn, NY 11219
Rita Safier, as Trust	Florence Gruen Family	1447 40th ST LLC
Adjacent Property Owner	Adjacent Property Owner	Adjacent Property Owner
of 1453 40th Street	of 1449 40th Street	of 1447 40th Street
1453 40th Street	1449 40th Street	1447 40th Street
Brooklyn, Ny 11219 Israel Meir Melamud	Brooklyn, NY 11219 David Klein	Brooklyn, NY 11219 Isidore Mendelovitz
Adjacent Property Owner of 1443 40th Street	Adjacent Property Owner of 1441 40th Street	Adjacent Property Owner of 1437 40th Street
1443 40th Street	1441 40th Street	1437 40th Street
Brooklyn, NY 11219 Gan Bayis LLC	Brooklyn, NY 11219 Harrie Friedman/TR	Brooklyn, NY 11219 Katz Oshera
Adjacent Property Owner	•	_
of 1435 40th Street	Adjacent Property Owner of 1431 40th Street	Adjacent Property Owner of 1429 40th Street
1435 40th Street	1431 40th Street	1429 40th Street
Brooklyn, NY 11219	Brooklyn, NY 11219	Brooklyn, NY 11219
Community, Civic, Rei	igious and Other Environm	entai Organizations
Antonia Yuille - Director	Marc Katz - President	Engine 282 Ladder 148
Consolidated Edison	66th Police Precinct	FDNY
Corporate Affairs	Council	4210 12th Avenue
30 Flatbush Avenue	5822 16th Avenue	Brooklyn, NY 11219
Brooklyn, NY 11217	Brooklyn, NY 11204	
Bangladesh Muslim Centre	Southern Brooklyn	Council on Peoples
NY	Community Organization	Organization
105 Cortelyou Road	4006 18th Avenue	1077 Coney Island Avenue
100 Corteryou Mad	TOOU TOUT AVEILUE	1011 Coney Island Avenue

Brooklyn, NY 11218	Brooklyn, NY 11218	Brooklyn, NY 11230

Appendix C - Site Location Map



Appendix D- Brownfield Cleanup Program Process





c. Population density around site:

Division of Environmental Remediation

Remedial Programs

Scoping Sheet for Major Issues of Public Concern (see instructions)
Site Name: 1440-1460 39th Street
Site Number: C224311
Site Address and County: 1440, 1446, 1455-1460 39 th St. and 40 th St., Brooklyn, NY
Remedial Party(ies): SnL XXII, 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. The list of potential impacts contained in the CPP are typical impacts of remediation on brownfield sites
How were these issues and/or information needs identified? See response above.
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. Nothing is needed from the community at this time
How were these information needs identified? NA
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. Communication of each step in the BCP process must be communicated in Fact Sheets and public hearings if required.
How were these issues and/or information needs identified? This is part of the 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

□ 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? \Box Yes \boxtimes No
Provide details if appropriate: Click here to enter text.
f. Other environmental issues significantly impacted/impacting the affected community? \square Yes \boxtimes No
Provide details if appropriate: Click here to enter text.
g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area? \boxtimes Yes \square No
h. Special considerations: ☑ Language □ Age □ Transportation □ Other
Explain any marked categories in h : Primarily Bangladeshi and Hindi speaking population
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 <i>other</i> 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.

Date: 9/15/2020

Prepared/Updated By: Linda R. Shaw, Esq.

Reviewed Approved By: Thomas V. Panzone

Date: 10/21/20

APPENDIX D HEALTH AND SAFETY PLAN



SITE-SPECIFIC HEALTH AND SAFETY PLAN

Proposed SNL Storage Facility 1440-1460 39th Street, Brooklyn, New York

Prepared For:

SNL XXII, LLC 3333 New Hyde Park Road, Lake Success, New York 11042

Prepared By:

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

Project No.: 10737

December 2020

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 SNL XX II, LLC., and may not be relied upon by any other person without the express written consent and authorization of SFSI

SITE-SPECIFIC HEALTH AND SAFETY PLAN

For

1440-1460 39th Street Brooklyn, New York

Prepared by:		Date:
	Justin M. Protasiewicz, PE SESI- Principal (and Project M	¶anager for job)
Approved by:		Date:
	Justin M. Protasiewicz, PE SESI-Principal (and Project M	anager for iob\

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Attachment 6		nt 6	Safety Data Sheets (SDS)	

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 some volatile organic compounds, semi-volatile organic compounds, and pesticides, in soil and soil vapor. Concentrations of airborne COCs during site tasks may be measurable and air monitoring should be performed.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is low.

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	<u><</u> 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	<u>≥</u> 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to <u><</u> 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
Chemical Sampling	Modified Level D/Level C
Decontamination	Modified 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 investigation activities at the Proposed self-storage facility at 1440-1460 39th Street in City of Brooklyn (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 proposed self-storage facility (the Site) is located in the City of Brooklyn, Kings County, New York. **Figure 2.1** provides a location of the Site and surrounding properties. The Site consists of approximately 0.57 acres. The Site is located on tax map records as Block 5346; Lots 17, 26, 28, and 149. The Site location is depicted on a United States Geological Survey (USGS) Topographic Map (**Figure 2.1** of RAWP).

The Site is currently improved by the building slabs and foundations left in-place following recent demolition activities of the two (2) single-story structures. The former site building operations include warehouse and office space uses. Approximately 0.45 acres of the Site was covered by the former structures. The remaining estimated 0.12 acres of the Site is improved by concrete or asphalt surface cover.

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 onsite 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;
- Post-Excavation Sampling
- Decontamination and demobilization.

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)	Justin Protasiewicz	973-808-9050				
Senior Project Engineer (SPE)	TBD					
Health and Safety Manager (HSM)	TBD					
Site Safety Officer (SSO)	TBD					
Field Supervisor (FS)	Jonathan Stuart	973-808-9050				
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 overhead 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
Chemical Sampling	Modified Level D/Level C
Decontamination	Modified 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	0 ppm to <u><</u> 1 ppm	Normal operations; continue hourly breathing zone monitoring
Hydrocarbons		
	> 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
	_ o ppin to _ oo ppin	opgrado to zever o 1 1 z, continuo corconini g foi penzente
	> 50 ppm	Stop work; investigate cause of reading
Benzene	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> E nnm	Ston works investigate cause of reading
Dust	> 5 ppm 0 to .5 mg/m3	Stop work; investigate cause of reading Normal operations
Dust	0 to .5 mg/ms	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	<u><</u> 19.5%	Stop work, evacuate confined spaces/work area, investigate cause
		of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	7 13.570 to < 25.570	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause
		of reading, and ventilate area
Carbon	0 ppm to <u><</u> 20 ppm	Normal operations
Monoxide	. 00	Ot
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Hydrogen	0 ppm to < 5 ppm	Normal operations
Sulfide	o ppin to 3 o ppin	Hormal opolations
	> 5 ppm	Stop work, evacuate confined spaces/work area, investigate cause
	·	of reading, and ventilate area
Flammable	< 10% LEL	Normal operations
Vapors (LEL)	400/ 151	
	≥ 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
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5° - 90°F (30.8°-32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° - 87.5°F (28.1° - 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° - 77.5°F (30.8° - 32.2°C)	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

	Actual Temperature Reading (°F)											
	Actua	l Tempei	ature R	eading (°	F)							
Estimated Wind	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
Speed (in mph)												
,	Equiv	alent Ch	II Temp	erature (°	°F)				· I		II.	
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	LITTLE DANGER INCREASING DANGER GREAT DANGER											
greater than 40	Maximum danger of false Danger from freezing of Flesh may freeze within 30				in 30							
mph have little	sense of security. exposed flesh within seconds.											
additional effect.)	one minute.											
·	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 subzero 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 coldweather 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 coworker 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 multiconductor 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 onequarter 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 F X Solid Liquid		GasVapor
	Containment Type(s): Drum Tank Pond Lagoon	Pit Other:	Debris
	Hazardous Material Characteristics: X Volatile Corrosive Ignitable X Toxic	Reactive	Radioactive
	Routes of Exposure: X Oral X Dermal	_XEye	X_ Respiratory
9.1.2	Potential Health and Safety Hazar X Heat X Cold Confined space entry Oxygen depletion Asphyxiation X Excavation X Cave-ins X Falls, slippage	X Congested X General Co X Physical in Electrical h Handling a Fire Explosion X Biological h X Plants X Insects X Insects	onstruction jury lazards nd product transfer Hazards – Poison Ivy, Poison Oak
etc.)	Other: Potential Ignition Haza		nd Mice ng Radiation (i.e. UV, IR,

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 Chemical Sample Collection/Analysis

Description of Tasks

This sub-task consists of the collection of post excavation 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.

9.2.2 Decontamination

All sampling 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.

9.3 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 SVOCs, pesticides and metals.

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	Highest Detected Concentration (mg/kg)	Applicable Monitoring Instrument		
2-Methylnaphthalene	0.182	PID		
2-Methylphenol	0.204	PID		
3+4-Methylphenol	0.655	PID		
Acenaphthene	19.1	PID		
Acenaphthylene	12.4	PID		
Anthracene	46.8	PID		
Benzo(a)anthracene	79.6	PID		
Benzo(a)pyrene	48.5	PID		
Benzo(b)fluoranthene	84.9	PID		
Benzo(g,h,i)perylene	35.3	PID		
Benzo(k)fluoranthene	24.3	PID		
bis(2- ethylhexyl)phthalate	0.666	PID		
Butylbenzylphthalate	0.602	PID		
Carbazole	0.327	PID		
Chrysene	69.7	PID		
Dibenzo(a,h)anthracene	9.51	PID		
Dibenzofuran	21.9	PID		
Dimethylphthalate	0.322	PID		
Di-n-butylphthalate	1.07	PID		
Fluoranthene	190	PID		
Fluorene	28.6	PID		
Indeno(1,2,3-cd)pyrene	31.8	PID		
Naphthalene	16.6	PID		
Phenanthrene	220	PID		
Phenol	0.141	PID		
Pyrene	176	PID		

Media: Soil

Metals	Highest Detected Concentration (mg/kg)	Applicable Monitoring Instrument
Antimony	12.2	NA
Aluminum	18800	NA
Arsenic	14.1	NA
Barium	1660	NA
Beryllium	0.666	NA
Cadmium	4.13	NA
Calcium	44700	NA
Chromium	28	NA
Cobalt	17.5	NA
Copper	188	NA
Cyanide	0.805	NA
Iron	23200	NA
Lead	528	NA
Magnesium	17100	NA
Manganese	441	NA
Mercury	14.2	NA
Nickel	57	NA
Potassium	2600	NA
Silver	5.12	NA
Sodium	1610	NA
Thallium	1.59	NA
Vanadium	36.5	NA
Zinc	1390	NA

Media: Soil					
	Applicable Monitoring				
VOCs	(mg/kg)	Instrument			
Methyl					
Acetate	0.00519	PID			

Media: Soil				
Pesticides 4,4'-DDT	Highest Detected Concentration (mg/kg) 0.0163 oil Vapor	Applicable Monitoring Instrument NA		
VOCs	Highest Detected Concentration (ug/m3)	Applicable Monitoring Instrument		
1,1,2-Trichloro-1,2,2-trifluoroethane	0.45	PID		
4-Ethyltoluene	6.2	PID		
Dichlorodifluoromethane	3	PID		
1,1,1-Trichloroethane	4	PID		
1,2,4-Trimethylbenzene	27	PID		
1,3,5-Trimethylbenzene	8.7	PID		
2-Butanone (MEK)	21	PID		
2-Methyl-2-propanol	140	PID		
Acetone	220	PID		
Benzene	3.6	PID		
Butadiene	4.5	PID		
Carbon disulfide	32	PID		
Carbon tetrachloride	0.41	PID		
Chloroform	1.8	PID		
Chloromethane	1	PID		
Cyclohexane	2.5	PID		
Ethanol	85	PID		
Ethylbenzene	8.5	PID		
Hexane	6.2	PID		
Isooctane	22	PID		
Isopropyl alcohol	44	PID		
m-Xylene & p-Xylene	30	PID		
Naphthalene	5.8	PID		
n-Heptane	6.1	PID		
o-Xylene	3.8	PID		
Styrene	1.8	PID		
Tetrachloroethene	6.7	PID		
Toluene	19	PID		
Trichlorofluoromethane	1.2	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

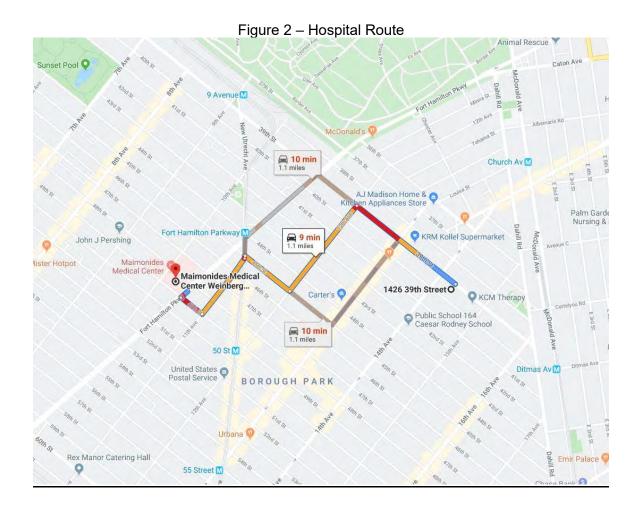
Local Emergency Contacts	Telephone No.
EMERGENCY	911
Weinberg Emergency Center	(718) 283-6000
Police Emergency	911
Police (Brooklyn Police Department)	(718) 851-5511
Fire Emergency	911
Rescue Squad	911
Ambulance	911
Miscellaneous Contacts	Telephone No.
N.Y. Poison Control Center	(800) 222-1222
National 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

Weinberg Medical Center 4808 Fort Hamilton Parkway Brooklyn, New York 11219

Directions to Hospital:

Head NW on 39th Street toward 14th Avenue Turn Left onto 12th Avenue Turn Right onto 45th Street Turn Left onto New Utrecht Avenue Slight right onto 11th Avenue Turn right onto 49th Street Turn Right onto Fort Hamilton Parkway Destination will be on your right.



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 Safety Data Sheets

Safety Data Sheets (SDS) 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 6).

Figures

aas, LAYOUT:FIG-2.1

LOCATION MAP.DWG 12/04/20 11:15:38AM,

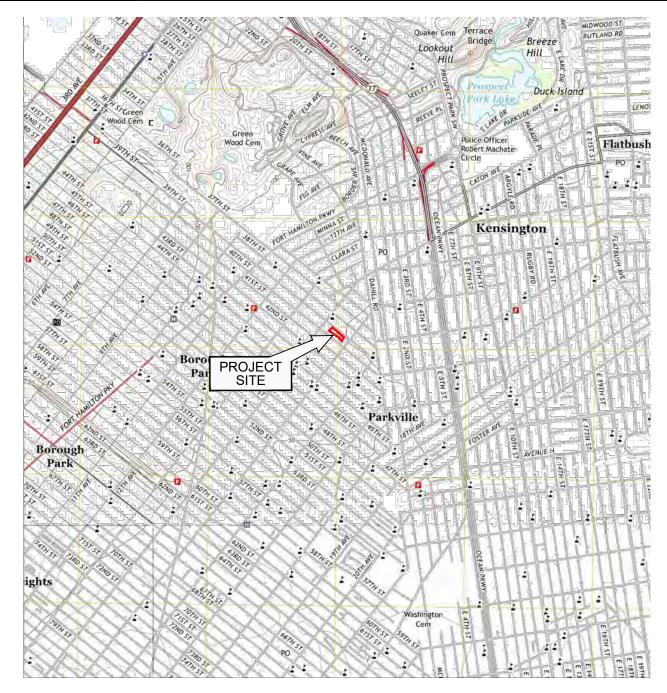
SIE

1

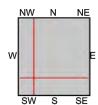
FIG-2.1

I

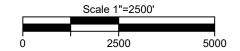
N: \ACAD\10737\IRMWP\10737



This report includes information from the following map sheet(s).



TP, Brooklyn, 2013, 7.5-minute SE, Coney Island, 2013, 7.5-minute SW, The Narrows, 2013, 7.5-minute NW, Jersey City, 2014, 7.5-minute



1440-1460 39TH STREET BLOCK 5346; LOTS 17, 26, 28, 149 BROOKLYN, 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-2.1

DRAWN BY: yy

CHECKED BY: TTK

SCALE: AS NOTED

DATE: 12/04/2020

JOB NO.: 10737

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	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

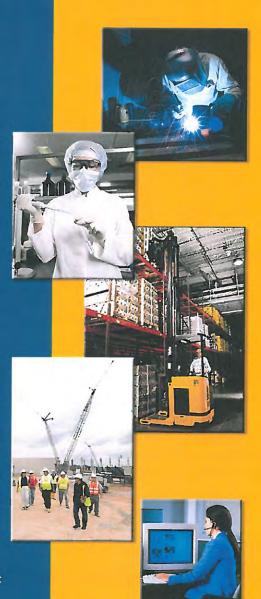
EMPLOYEES:

- 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 3166-02 2012R



ATTACHMENT 3 FILED CHANGE REQUEST FORM

HEALTH & SAFETY PLAN CHANGE NOTICE

Pages _____ of ____

Project	:					H&S-CN
1)	HASP	VERSIO	ON:	SECTION:		PAGE (s):
	RE:		Change to existin Addition to existing Other:	ng HASP		rision Date:
						CONT
2)	PROPO	SED C	HANGE:			
3)	REASC	ON FOR		C or Change Order	Other: _	
		 	Disposition of De Change in Regula Operational Expe	atory or Other Requi	rements	CONT
4)	EXHIB	ITS AT	TACHEDNO	YES (If YE	S, describe)	CONT
5)	PMK A	PPROV	SITE	MANAGER:		Date: Date: Date:
	Client A	Approva	al Required:1	NO YES (If Y	YES, date submitted)	
6)	_			APPROVED	REMANDED	REJECTED
						CONT
	Client F	Represei	ntative:			Date:
7)	DISTR	IBUTIC	ON AFTER APPROV	VAL		
	$\frac{X}{X}$ X	CLIE		OTHER:		
8)	PREPA		Y:le:			Date:

ATTACHMENT 4 INJURY REPORT FORM

OSHA's Form 301 Injury and Illness Incident Report

occupational safety and health purposes. possible while the information is being used for protects the confidentiality of employees to the extent employee health and must be used in a manner that Attention: This form contains information relating to

U.S. Department of Labor Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

and severity of work-related incidents. employer and OSHA develop a picture of the extent accompanying Summary, these forms help the first forms you must fill out when a recordable workthe Log of Work-Related Injuries and Illnesses and the related injury or illness has occurred. Together with This Injury and Illness Incident Report is one of the

asked for on this form. any substitute must contain all the information substitutes. To be considered an equivalent form, insurance, or other reports may be acceptable equivalent. Some state workers' compensation, illness has occurred, you must fill out this form or an information that a recordable work-related injury or Within 7 calendar days after you receive

this form on file for 5 years following the year to which it pertains 1904, OSHA's recordkeeping rule, you must keep According to Public Law 91-596 and 29 CFR

may photocopy and use as many as you need. If you need additional copies of this form, you

8) Was employee treated in an emergency room?	CityStateZIP	Street	7) If treatment was given away from the worksite, where was it given? Facility	Information about the physician or other health care professional 6) Name of physician or other health care professional	3) Date of birth /	City State ZIP	2) Street	I) Full name	Information about the employee
"radial arm saw." If this question does not apply to the incident, leave it blank.	17) What a firm a		16) What was the injury or illness? Tell us th more specific than "hurt," "pain," or sore tunnel syndrome."	15) What happened? Tell us how the injury of fell 20 feet", "Worker was sprayed with el developed soreness in wrist over time."	14) What was the employee doing just before the incident occurred? Do tools, equipment, or material the employee was using. Be specific. Exa carrying roofing materials"; "spraying chlorine from hand sprayer";	13) Time of event	12) Time employee began work//	10) Case number from the Log	Information about the case
"radial arm saw." If this question does not apply to the incident, leave it blank.			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."	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."	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."	AM / PM	MA / MW	(Fransfer the case number from the Log after you record the case.)	,

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.

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact. US Department of Labor, OSHA Office of Statistical Analysis, Room N-8542, 200 Constitution Avenue, NW. Washington, DC 20210. Do not send the completed forms to this office.

Phone (

Date

Was employee hospitalized overnight as an in-patient?

Ves

No

Completed by

Yes No

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

occupational safety and health purposes. possible while the information is being used for protects the confidentiality of employees to the extent employee health and must be used in a manner that Attention: This form contains information relating to

Year 20

U.S. Department of Labor Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

Identify the person		Describe the case	he case		Class	Classify the case	ase		Acres in the	
(A) (B) Case Employee's name	(C) Job title	(D) Date of injury		(F) Describe injury or illness, parts of body affected,	CHECK OF based on that case:	ONLY ONI	CHECK ONLY ONE box for each case based on the most serious outcome for that case:	ch case Itcome for	Enter the number of days the injured or ill worker was:	Check the "Injury" column or choose one type of illness:
no.	(e.g., Welder)	or onset of illness	(e.g., Loading dock north end)	and object/substance that directly injured or made person ill (e.g., Second degree burns on			Remain	Remained at Work		ory 1
				right Jorearm from acetylene torch)	Death	Days away from work	Job transfer or restriction	Other record-	from transfer or work restriction	Injury Skin dis Respirat conditio Poisonir Hearing All other
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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 clear 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 Cabor, OSHA Office of Statistical	rmation is estimated to a ed, and complete and rev it displays a currently va- data collection, contact: t	verage 14 minutes pe tiew the collection of i lid OMB control num JS Department of Lal	r response, including time to review information. Persons are not required their. If you have any comments for, OSHA Office of Statistical	Be sure to transfer these totals to the Summary page (Form 300A) before you post it.	hese totals to	the Summary	page (Form 30	10A) before , ou pos	tit.	Injury Skin disorder Respiratory condition Poisoning Hearing lo-
Zutalysis, Room N-3014, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office,	, NW, Washington, DC 2	0210. Do not send the	e completed forms to this office.						Page of	141 101 101 111 121 121

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

to verify that the entries are complete and accurate before completing this summary. 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

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

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	ases		
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)	(0)	(3)
Number of Days	lays		
Total number of days away from work		Total number of days of job transfer or restriction	
3		Œ	
Injury and Illness Types	iness Types		
Total number of (M) (1) Injuries		(4) Poisonings	
(2) Skin disorders (3) Respiratory conditions	ons	(5) Hearing loss(6) All other illnesses	

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 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.

our establishment name
žity
ndustry description (e.g., Manufacture of motor truck trailers)
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And American Industrial Classification (N Imployment information (If you d forksheet on the back of this page to estimate.) Annual average number of employees but hours worked by all employees last year inowingly falsifying this document mowledge the entries are true, accurate, ampuny essentive

ATTACHMENT 5 SIGNATORY PAGE

Attachment 4 – Site-Specific Health and Safety Orientation Signatory Page HEALTH AND SAFETY PLAN 4380 Bullard Avenue, Bronx, NY

Title	Name	Signature
Project Manager:	Justin M. Protasiewicz, PE	
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
	Health and Safety Orientatio	n Signatory Page	

Health and Safety Orientation Signatory Page (2 of 2)

Attachment 6

SAFETY DATA SHEET

Version 5.4 Revision Date 01/26/2016 Print Date 07/17/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 2-Methylnaphthalene

Product Number : 45796

Brand : Sigma-Aldrich

CAS-No. : 91-57-6

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, Oral (Category 4), H302 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)

H302 Harmful if swallowed.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you

feel unwell. Rinse mouth.

P391 Collect spillage.

P501 Dispose of contents/ container to an approved waste disposal plant.

Sigma-Aldrich - 45796 Page 1 of 8

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : β-Methylnaphthalene

Formula : C₁₁H₁₀

Molecular weight : 142.20 g/mol

CAS-No. : 91-57-6

EC-No. : 202-078-3

Hazardous components

Component	Classification	Concentration
2-Methylnaphthalene		
	Acute Tox. 4; Aquatic Acute 2; Aquatic Chronic 2; H302, H411	<= 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. Avoid breathing dust.

Sigma-Aldrich - 45796 Page 2 of 8

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): 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	Basis	
			parameters		
2-	91-57-6	TWA	0.500000 ppm	USA. ACGIH Threshold Limit Values	
Methylnaphthalene				(TLV)	
	Remarks	Skin contact does contribute to exposure.			
		Not classifiable as a human carcinogen			
		TWA	0.5 ppm	USA. ACGIH Threshold Limit Values	
				(TLV)	
		Lower Respiratory Tract irritation			
		Lung damage			
		Not classifiable as a human carcinogen			
		Danger of cutaneous absorption			

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

Sigma-Aldrich - 45796 Page 3 of 8

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

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. 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

34.0 - 36.0 °C (93.2 - 96.8 °F)

g) Flash point

Initial boiling point and

boiling range

241.0 - 242.0 °C (465.8 - 467.6 °F)

98.0 °C (208.4 °F) - closed cup

h) Evaporation rate No data available Flammability (solid, gas) No data available

Upper/lower flammability or No data available

explosive limits

k) Vapour pressure No data available Vapour density No data available

m) Relative density 1.00 g/cm3

n) Water solubility No data available o) Partition coefficient: n-

octanol/water

log Pow: 3.80

p) Auto-ignition temperature

No data available

q) Decomposition temperature

No data available

Sigma-Aldrich - 45796 Page 4 of 8 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

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

LD50 Oral - Rat - 1,630 mg/kg

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Mild skin irritation

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

Sigma-Aldrich - 45796 Page 5 of 8

Specific target organ toxicity - single exposure

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: QJ9635000

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) - 2.5 mg/l

Toxicity to daphnia and

Immobilization EC50 - Daphnia magna (Water flea) - 1.5 mg/l - 48 h

other aquatic invertebrates

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 28 d

- 0.017 mg/l

Bioconcentration factor (BCF): 23,500

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.

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. (2-Methylnaphthalene)

Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (2-Methylnaphthalene)

Further information

Sigma-Aldrich - 45796 Page 6 of 8

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

Acute Health Hazard

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 2-Methylnaphthalene 91-57-6 2010-08-02

New Jersey Right To Know Components

2-Methylnaphthalene CAS-No. Revision Date 2010-08-02

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.

Acute Tox. Acute toxicity

Aquatic Acute Acute aquatic toxicity
Aquatic Chronic Chronic aquatic toxicity
H302 Harmful if swallowed.
Toxic to aquatic life.

H411 Toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard: 2
Chronic Health Hazard: Flammability: 1
Physical Hazard 0

NFPA Rating

Health hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0

Further information

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Sigma-Aldrich - 45796 Page 7 of 8

Preparation Information Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.4 Revision Date: 01/26/2016 Print Date: 07/17/2019

Sigma-Aldrich - 45796 Page 8 of 8

SAFETY DATA SHEET

Version 4.12 Revision Date 08/10/2016 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 2-Methylphenol

Product Number : 442361
Brand : Supelco
Index-No. : 604-004-00-9

CAS-No. : 95-48-7

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 Skin corrosion (Category 1B), H314 Serious eye damage (Category 1), H318 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 Danger

Hazard statement(s)

H301 + H311 Toxic if swallowed or in contact with skin Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P260 Do not breathe dust or mist.

P264 Wash skin thoroughly after handling.

Supelco - 442361 Page 1 of 9

P270 Do not eat, drink or smoke when using this product. 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 P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove person to fresh air and keep comfortable for P304 + P340 + P310 breathing. Immediately call a POISON CENTER/doctor. P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. P362 Take off contaminated clothing and wash 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 : o-Cresol

2-Methylphenol

Formula : C7H8O

Molecular weight : 108.14 g/mol

CAS-No. : 95-48-7

EC-No. : 202-423-8

Index-No. : 604-004-00-9

Hazardous components

Component	Classification	Concentration
o-Cresol		
	Acute Tox. 3; Skin Corr. 1B;	<= 100 %
	Eye Dam. 1; Aquatic Acute 2;	
	Aquatic Chronic 2; H301 +	
	H311, H314, H318, H411	

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

Take off contaminated clothing and shoes immediately. 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. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Supelco - 442361 Page 2 of 9

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

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. 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.

Air and light sensitive. 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

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Component	CAS-No.	Value	Control parameters	Basis			
o-Cresol	95-48-7	TWA	5.000000 ppm 22.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants			
	Remarks	Skin contact does contribute to exposure.					
		TWA	5.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)			
		Eye, skin, & Upper Respiratory Tract irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC 2010 Revision or addition to the notice of intended changes See Notice of Intended Changes (NIC) Danger of cutaneous absorption					
		TWA	2.300000 ppm 10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits			
		TWA	20.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)			
		Not classifia	oiratory Tract irritati able as a human ca utaneous absorptio	arcinogen			
		TWĂ	5 ppm 22 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants			
		Skin designation					
		The value in	The value in mg/m3 is approximate.				
		TWA	20 mg/m3	USA. ACGIH Threshold Limit Values (TLV)			
		Upper Resp	Upper Respiratory Tract irritation				
			Not classifiable as a human carcinogen				
			Danger of cutaneous absorption				
		PEL	5 ppm 22 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)			
		Skin	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: 0.4 mm Break through time: 480 min

Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact Material: Nitrile rubber

Minimum layer thickness: 0.2 mm Break through time: 30 min

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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 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: white

b) Odour No data available

c) Odour Threshold No data available 4.5 at 25.00000 g/l d) pH

e) Melting point/freezing

point

Melting point/range: 29 - 31 °C (84 - 88 °F) - lit.

Initial boiling point and f)

boiling range

191 °C (376 °F) - lit.

g) Flash point 81.0 °C (177.8 °F) - closed cup

h) Evaporation rate No data available Flammability (solid, gas) No data available

Upper/lower Upper explosion limit: 58 %(V) flammability or Lower explosion limit: 1.3 %(V)

explosive limits

3.1 hPa (2.3 mmHg) at 60.0 °C (140.0 °F) k) Vapour pressure

1.3 hPa (1.0 mmHg) at 38.2 °C (100.8 °F) 0.4 hPa (0.3 mmHg) at 20.0 °C (68.0 °F)

Vapour density No data available

1.05 g/cm3 at 20.00 °C (68.00 °F) m) Relative density

25 g/l at 20 °C (68 °F) n) Water solubility

o) Partition coefficient: n-

octanol/water

No data available

599.0 °C (1,110.2 °F) p) Auto-ignition

temperature

q) Decomposition temperature

No data available

Viscosity No data available r)

Supelco - 442361 Page 5 of 9 s) Explosive properties No data availablet) 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

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 - 121.0 mg/kg

Remarks: Behavioral:Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration:Dyspnea.

Gastrointestinal:Ulceration or bleeding from stomach.

LC50 Inhalation - Rat - 1 h - > 1,220 mg/m3

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation. Behavioral:Somnolence (general depressed activity).

LD50 Dermal - Rabbit - 890.0 mg/kg

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Severe skin irritation - 24 h

(Draize Test)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Severe eye irritation

(Draize Test)

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.

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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: GO6300000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Central nervous system depression, Diarrhoea, Gastrointestinal disturbance

Stomach - Irregularities - Based on Human Evidence Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Leuciscus idus (Golden orfe) - 10.00 mg/l - 96 h

Toxicity to daphnia and

Immobilization EC50 - Daphnia magna (Water flea) - 15.8 mg/l - 48 h

other aquatic invertebrates

Toxicity to algae EC50 - SELENASTRUM - 100.00 mg/l - 72 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. 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. 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.

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14. TRANSPORT INFORMATION

DOT (US)

UN number: 3455 Class: 6.1 (8) Packing group: II

Proper shipping name: Cresols, solid Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 3455 Class: 6.1 (8) Packing group: II EMS-No: F-A, S-B

Proper shipping name: CRESOLS, SOLID

IATA

UN number: 3455 Class: 6.1 (8) Packing group: II

Proper shipping name: Cresols, solid

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

o-Cresol CAS-No. Revision Date 95-48-7 2007-07-01

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

CAS-No. Revision Date 95-48-7 2007-07-01

SARA 311/312 Hazards

o-Cresol

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

o-Cresol CAS-No. Revision Date 95-48-7 2007-07-01

Pennsylvania Right To Know Components

o-Cresol CAS-No. Revision Date 95-48-7 2007-07-01

New Jersey Right To Know Components

o-Cresol CAS-No. Revision Date 95-48-7 2007-07-01

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.

Acute Tox. Acute toxicity

Aquatic Acute Acute aquatic toxicity
Aquatic Chronic Chronic aquatic toxicity
Eye Dam. Serious eye damage
H301 Toxic if swallowed.

H301 + H311 Toxic if swallowed or in contact with skin

H311 Toxic in contact with skin.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

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HMIS Rating

Health hazard: 3
Chronic Health Hazard: *
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 3
Fire Hazard: 2
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.12 Revision Date: 08/10/2016 Print Date: 06/28/2019

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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 : C₁₄H₉Cl₅

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	90 - 100 %
	RE 1; Aquatic Acute 1; Aquatic	
	Chronic 1; H301 + H311,	
	H351, H372, H410	

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

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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

Tomponomo man no replaco comi or parametero				
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		vith unknown relevance to humans

TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
Potential Oc See Append	cupational Carcino ix A	ogen
TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
Skin designa	ation	
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

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b) Odourc) Odour Thresholdd) pHNo data availableNo 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 No data available

flammability or explosive limits

k) Vapour pressure 0.0000021 hPa (0.0000016 mmHg) at 20.0 °C (68.0 °F)

I) Vapour density No data available

m) Relative density 0.99 g/cm3

n) Water solubility No data available
 o) Partition coefficient: n- log Pow: 6.91 octanol/water

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

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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. -

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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)

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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		
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
Pennsylvania Right To Know Components	040 N	Destate Dete
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
New Jersey Right To Know Components		
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	CAS-No. 50-29-3	Revision Date 1993-02-16
California Prop. 65 Components 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	CAS-No. 50-29-3	Revision Date 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	CAS-No. 50-29-3	Revision Date 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	CAS-No. 50-29-3	Revision Date 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	CAS-No. 50-29-3	Revision Date 2008-06-17

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

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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

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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

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SAFETY DATA SHEET

Version 3.9 Revision Date 08/10/2016 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4-Methylphenol

Product Number : 442418
Brand : Supelco
Index-No. : 604-004-00-9

CAS-No. : 106-44-5

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, Dermal (Category 3), H311 Skin corrosion (Category 1B), H314 Serious eye damage (Category 1), H318 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 Danger

Hazard statement(s)

H301 + H311 Toxic if swallowed or in contact with skin Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P260 Do not breathe dust or mist.

P264 Wash skin thoroughly after handling.

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P270	Do not eat, drink or smoke when using this product.
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.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
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 : p-Cresol

4-Methylphenol

Formula : C₇H₈O

Molecular weight : 108.14 g/mol
CAS-No. : 106-44-5
EC-No. : 203-398-6
Index-No. : 604-004-00-9

Hazardous components

Component	Classification	Concentration
p-Cresol		
	Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 2; Aquatic Chronic 2; H301 + H311, H314, H411	<= 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

Take off contaminated clothing and shoes immediately. 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. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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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.

hygroscopic Air and light sensitive. Handle and store under inert gas.

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

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Component	CAS-No.	Value	Control	Basis	
			parameters		
p-Cresol	106-44-5	TWA	2.3 ppm	USA. NIOSH Recommended	
			10 mg/m3	Exposure Limits	
		TWA	5 ppm	USA. Occupational Exposure Limits	
			22 mg/m3	(OSHA) - Table Z-1 Limits for Air	
				Contaminants	
	Remarks	Skin design	nation	oximate.	
		The value i	n mg/m3 is approx		
		TWA	20 mg/m3	USA. ACGIH Threshold Limit Values	
				(TLV)	
		Upper Res	piratory Tract irrita	ation	
		Not classifia	able as a human d	carcinogen	
		Danger of cutaneous absorption		tion	
		PEL	5 ppm	California permissible exposure	
			22 mg/m3	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: 0.4 mm Break through time: 480 min

Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.2 mm Break through time: 30 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 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).

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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: 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: 32 - 34 $^{\circ}\text{C}$ (90 - 93 $^{\circ}\text{F})$ - lit.

f) Initial boiling point and

boiling range

202 °C (396 °F) - lit.

g) Flash point 85.0 °C (185.0 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, gas) No data available

j) Upper/lower flammability or explosive limits Lower explosion limit: 1.1 %(V)

k) Vapour pressure 1.3 hPa (1.0 mmHg) at 20.0 °C (68.0 °F)

I) Vapour density No data available

m) Relative density 1.034 g/mL at 25 °C (77 °F)

n) Water solubility No data availableo) Partition coefficient: n- log Pow: 1.94

octanol/water

559.0 °C (1,038.2 °F)

p) Auto-ignition temperature

q) Decomposition No data available

temperature

Viscosity No data available

s) Explosive properties No data availablet) Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

r)

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, Bases

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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 - 207.0 mg/kg

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Olfaction:Other changes. Behavioral:Convulsions or effect on seizure threshold. Gastrointestinal:Ulceration or bleeding from stomach.

LC50 Inhalation - Rat - 1 h - > 710 mg/m3

LD50 Dermal - Rabbit - 301.0 mg/kg

Remarks: Behavioral:Tremor. Gastrointestinal:Changes in structure or function of salivary glands. Kidney, Ureter, Bladder:Other changes.

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Severe skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Severe eye irritation

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: GO6475000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, laryngitis, Dizziness, Cardiovascular effects., Muscle cramps/spasms., Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

Kidney -

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12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - other fish - 16.00 - 24.00 mg/l - 24 h

LC50 - Oncorhynchus mykiss (rainbow trout) - 7.9 mg/l - 96 h

Toxicity to daphnia and

other aquatic invertebrates

LC50 - Daphnia magna (Water flea) - 1.4 mg/l - 48 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.

Toxic to aquatic life.

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)

UN number: 3455 Class: 6.1 (8) Packing group: II

Proper shipping name: Cresols, solid Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 3455 Class: 6.1 (8) Packing group: II EMS-No: F-A, S-B

Proper shipping name: CRESOLS, SOLID

IATA

UN number: 3455 Class: 6.1 (8) Packing group: II

Proper shipping name: Cresols, solid

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

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p-Cresol 106-44-5 2007-07-01

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

p-Cresol CAS-No. Revision Date 2007-07-01

Pennsylvania Right To Know Components

CAS-No. Revision Date p-Cresol 106-44-5 2007-07-01

New Jersey Right To Know Components

CAS-No. Revision Date p-Cresol 106-44-5 2007-07-01

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.

Acute Tox. Acute toxicity

Aquatic Acute Acute aquatic toxicity
Aquatic Chronic Chronic aquatic toxicity
Eye Dam. Serious eye damage
Toxic if swallowed.

H301 + H311 Toxic if swallowed or in contact with skin

H311 Toxic in contact with skin.

H314 Causes severe skin burns and eye damage.

HMIS Rating

Health hazard: 3
Chronic Health Hazard:
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 3
Fire Hazard: 2
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 3.9 Revision Date: 08/10/2016 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/07/2019 Print Date 06/28/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Acenaphthene

Product Number : 215376 Brand : Aldrich CAS-No. : 83-32-9

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 # : +1-703-527-3887

SECTION 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

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Short-term (acute) aquatic hazard (Category 1), H400 Long-term (chronic) aquatic hazard (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)

H315 Causes skin irritation.

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H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H410	Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
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.
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.
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.
P391	Collect spillage.
P403 + P233 P405	Store in a well-ventilated place. Keep container tightly closed. 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

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1,8-Ethylenenaphthalene

Formula : $C_{12}H_{10}$ Molecular weight : 154.21 g/mol CAS-No. : 83-32-9 EC-No. : 201-469-6

Component	Classification	Concentration
Acenaphthene		
	Skin Irrit. 2; Eye Irrit. 2A; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 1; H315, H319, H335, H400, H410 M-Factor - Aquatic Acute: 10	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

Millipore

SECTION 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

SECTION 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

SECTION 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.

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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.

SECTION 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): 11: Combustible Solids

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

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

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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

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/range: 90 - 94 °C (194 - 201 °F) - lit. point/freezing point

f) Initial boiling point 279 °C 534 °F - lit. and boiling range

g) Flash point 125.0 °C (257.0 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, No data available

gas)

j) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure 13.3 hPa at 131.0 °C (267.8 °F)

I) Vapour density No data availablem) Relative density No data available

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n) Water solubility No data available
 o) Partition coefficient: log Pow: 3.39 - 4.19
 n-octanol/water

p) Auto-ignition No data available temperature

q) Decomposition No data available temperature

r) Viscosity No data availables) Explosive properties No data availablet) 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

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available Dermal: No data available

LD50 Intraperitoneal - Rat - 600 mg/kg

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

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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

on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available No data available

Specific target organ toxicity - single exposure

Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: AB1000000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) - 0.67 mg/l - 96.0 h

LC50 - Pimephales promelas (fathead minnow) - 0.6 - 1.73 mg/l -

96.0 h

Toxicity to daphnia and other aquatic

invertebrates

Toxicity to algae

EC50 - Daphnia magna (Water flea) - 1.27 - 3.45 mg/l - 48 h

EC50 - Pseudokirchneriella subcapitata (green algae) - 0.52 - 0.53

mg/l - 96 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation Lepomis macrochirus (Bluegill) - 28 d

- 0.00894 mg/I(Acenaphthene)

Bioconcentration factor (BCF): 387

12.4 Mobility in soil

No data available

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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.

SECTION 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.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Acenaphthene)

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.

(Acenaphthene)
Marine pollutant: yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Acenaphthene)

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.

SECTION 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.

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SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Acenaphthene CAS-No. Revision Date 83-32-9 1993-02-16

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1 Revision Date: 05/07/2019 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 5.6 Revision Date 05/24/2016 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Acenaphthylene

Product Number : 416703 Brand : Aldrich

CAS-No. : 208-96-8

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)

Acute toxicity, Oral (Category 4), H302 Skin irritation (Category 2), H315 Eye irritation (Category 2A), H319

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

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)

H302 Harmful if swallowed.
H315 Causes skin irritation.

H319 Causes serious eye irritation. H335 May cause respiratory irritation.

Precautionary statement(s)

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.

P280 Wear eye protection/ face protection.

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P280 Wear protective gloves. 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 + 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 vou 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. If skin irritation occurs: Get medical advice/ attention. P332 + P313 P337 + P313 If eve irritation persists: Get medical advice/ attention. Take off contaminated clothing and wash before reuse. P362 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.

Hazards not otherwise classified (HNOC) or not covered by GHS - none 2.3

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 **Substances**

Formula : C₁₂H₈ 152.19 g/mol Molecular weight CAS-No. 208-96-8 205-917-1 EC-No.

Hazardous components

Component	Classification	Concentration
Acenaphthylene		
	Acute Tox. 4; Skin Irrit. 2; Eye	<= 100 %
	Irrit. 2A; STOT SE 3; H302,	
	H315, H319, H335	

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 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

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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

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.

Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection. 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.

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.

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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

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

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) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing

point

Melting point/range: 78 - 82 °C (172 - 180 °F) - lit.

f) Initial boiling point and boiling range

280 °C (536 °F) - lit.

g) Flash point 122.0 °C (251.6 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, gas) No data availablej) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure No data availablel) Vapour density No data available

m) Relative density 0.899 g/mL at 25 °C (77 °F)

n) Water solubilityNo data availableo) Partition coefficient: n-No data available

octanol/water

p) Auto-ignition No data available temperature

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 q) Decomposition No data available temperature

r) Viscosity No data availables) Explosive properties No data availablet) 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

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 - Mouse - 1,760 mg/kg

Remarks: Autonomic Nervous System:Other (direct) parasympathomimetic. Respiratory disorder Blood: Hemorrhage.

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

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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

Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: AB1254000

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

Mobility in soil

No data available

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

Waste treatment methods 13.1

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. (Acenaphthylene)

Reportable Quantity (RQ): 5000 lbs

Aldrich - 416703 Page 6 of 8 Poison Inhalation Hazard: No

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

Acute Health Hazard

Massachusetts Right To Know Components

Acenaphthylene	CAS-No. 208-96-8	Revision Date 1993-04-24
Pennsylvania Right To Know Components		
Acenaphthylene	CAS-No. 208-96-8	Revision Date 1993-04-24
New Jersey Right To Know Components		
Acenaphthylene	CAS-No. 208-96-8	Revision Date 1993-04-24
California Prop. 65 Components WARNING! This product contains a chemical known to the State of California to cause cancer. Acenaphthylene	CAS-No. 208-96-8	Revision Date 2007-09-28
WARNING! This product contains a chemical known to the State of California to cause cancer. Acenaphthylene	CAS-No. 208-96-8	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity
Eye Irrit. Eye irritation
H302 Harmful if swallowed.

H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Skin Irrit. Skin irritation

HMIS Rating

Health hazard: 2
Chronic Health Hazard: *
Flammability: 1
Physical Hazard 0

NFPA Rating

Health hazard: 2

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Fire Hazard: 1
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.6 Revision Date: 05/24/2016 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 4.9 Revision Date 05/27/2016 Print Date 06/28/2019

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.

7 200 Wear protective groves, eye protection, rade 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

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3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : A

 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.

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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 wetbrushing 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	Basis
			parameters	
	7429-90-5	TWA	1.000000	USA. ACGIH Threshold Limit Values
			mg/m3	(TLV)
	Remarks	Lower Respiratory Tract irritation		
		Pneumoconiosis		
		Neurotoxicity		
		Not classifial	ole as a human ca	rcinogen

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	lTWA	15.000000	USA. Occupational Exposure Limits
		mg/m3	(OSHA) - Table Z-1 Limits for Air
			Contaminants
	TWA	5.000000	USA. Occupational Exposure Limits
		mg/m3	(OSHA) - Table Z-1 Limits for Air
			Contaminants
	TWA	5.000000	USA. NIOSH Recommended
		mg/m3	Exposure Limits
	TWA	10.000000	USA. NIOSH Recommended
	T) A / A	mg/m3	Exposure Limits
	TWA	15.000000	USA. Occupational Exposure Limits
		mg/m3	(OSHA) - Table Z-1 Limits for Air Contaminants
	TWA	5.000000	USA. Occupational Exposure Limits
	IVVA	mg/m3	(OSHA) - Table Z-1 Limits for Air
		mg/ms	Contaminants
	TWA	5.000000	USA. NIOSH Recommended
	1 4 4 7	mg/m3	Exposure Limits
+	TWA	5.000000	USA. NIOSH Recommended
	1 4 4 7	mg/m3	Exposure Limits
	TWA	5.000000	USA. NIOSH Recommended
	1 * * / \	mg/m3	Exposure Limits
	TWA	1.000000	USA. ACGIH Threshold Limit Values
	' ' ' '	mg/m3	(TLV)
	Lower Res	spiratory Tract irrit	1, ,
	Pneumoco		
	Neurotoxi		
		fiable as a human	carcinogen
	varies		•
	TWA	1.000000	USA. ACGIH Threshold Limit Values
	<u> </u>	mg/m3	(TLV)
		spiratory Tract irrit	tation
	Pneumoco		
	Neurotoxio	city fiable as a human	carcinagan
	varies	ilable as a fluifiali	cardinogen
	TWA	15 mg/m3	USA. Occupational Exposure Limits
	1 1 1 1 1	15 1119/1115	(OSHA) - Table Z-1 Limits for Air
			Contaminants
	TWA	5 mg/m3	USA. Occupational Exposure Limits
	' ' ' '	J	(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)
		spiratory Tract irrit	tation
	Pneumoco		
	Neurotoxi		
	Not classi varies	fiable as a human	carcinogen
+	PEL	5 mg/m3	California permissible exposure
		09/1110	limits for chemical contaminants
			(Title 8, Article 107)
	PEL	5 mg/m3	California permissible exposure
		- 1.3.1.73	limits for chemical contaminants
			(Title 8, Article 107)

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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 availabled) pH No data available

e) Melting point/freezing Melting point/range: 660 °C (1,220 °F)

point

f) Initial boiling point and 2,467 °C (4,473 °F)

boiling range

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g) Flash point Not applicableh) 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 availablel) Vapour density No data available

m) Relative density 2.7 g/mL at 25 °C (77 °F)

n) Water solubility insoluble

 o) Partition coefficient: noctanol/water No data available

p) Auto-ignition temperature

not auto-flammable

q) Decomposition temperature

Not applicable

No data available

r) Viscosity No data availables) Explosive properties Risk of dust explosion.

9.2 Other safety information

Oxidizing properties

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

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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.

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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:

Aluminium powder (non pyrophoric)

CAS-No. Revision Date
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

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Fire Hazard: 3 Reactivity Hazard: 3

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.9 Revision Date: 05/27/2016 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 06/19/2019 Print Date 06/29/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Anthracene

Product Number : A89200 Brand : Aldrich CAS-No. : 120-12-7

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 # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 1A), H350 Short-term (acute) aquatic hazard (Category 1), H400 Long-term (chronic) aquatic hazard (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.

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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

Photosensitizer., Lachrymator.

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : $C_{14}H_{10}$ Molecular weight : 178.23 g/mol CAS-No. : 120-12-7 EC-No. : 204-371-1

Component	Classification	Concentration
Anthracene		
	Carc. 1A; Aquatic Acute 1; Aquatic Chronic 1; H350, H400, H410 M-Factor - Aquatic Acute: 1,000	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 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.

MILLIPORE

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

SECTION 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

SECTION 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.

SECTION 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.

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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

Components with workplace control parameters

Components w	<u>ith workplace</u>	e control pa	<u>rameters</u>	
Component	CAS-No.	Value	Control parameters	Basis
Anthracene	120-12-7	TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	include the from the di asphalt), w 8052-42-4 'coal tar pi	\$1910.1000 (Ta fused polycyclic stillation residue rood, and other of	
			0.1 mg/m3	Exposure Limits
		NIOSH con coal tar pro	oducts. e-extractable fra dix C dix A	cinogen coal tar pitch, and creosote to be
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		fraction) in which are k distillation wood, and and CAS 64	clude fused poly known carcinoge residues of coal, other organic m	nzene or cyclohexane-soluble cyclic hydrocarbons (some of ns) which volatilize from the petroleum (excluding asphalt), atter. Asphalt (CAS 8052-42-4, ot covered under the 'coal tar
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		fraction) in which are k distillation wood, and	clude fused poly known carcinoge residues of coal, other organic m	nzene or cyclohexane-soluble cyclic hydrocarbons (some of ns) which volatilize from the petroleum (excluding asphalt), atter. Asphalt (CAS 8052-42-4, ot covered under the 'coal tar

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i i	1
	pitch volatiles' standard.
	DITCH VOIATHES STANDARD.

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Anthracene	120-12-7	1- Hydroxypyr ene	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift a	at end of w	orkweek	
		3- hydroxyben zo(a)pyrene		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

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: Chloroprene

Minimum layer thickness: 0.6 mm Break through time: 480 min

Material tested: Camapren® (KCL 722 / Aldrich Z677493, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 30 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

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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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: crystalline

Colour: beige

b) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/range: 210 - 215 °C (410 - 419 °F) - lit.

point/freezing point

f) Initial boiling point 340 °C 644 °F - lit. and boiling range

g) Flash point 121.0 °C (249.8 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, No data available

gas)

j) Upper/lower Lower explosion limit: 0.6 %(V) flammability or

k) Vapour pressure 1.3 hPa at 145.0 °C (293.0 °F)

I) Vapour density No data availablem) Relative density No data availablen) Water solubility No data available

o) Partition coefficient: log Pow: 4.65 at ca.20 °C (ca.68 °F)

n-octanol/water

explosive limits

p) Auto-ignition 540.0 °C (1004.0 °F)

temperature

q) Decomposition No data available

temperature

r) Viscosity No data available

s) Explosive properties No data availablet) Oxidizing properties No data available

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9.2 Other safety information

No data available

SECTION 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, Hypochlorites

10.6 Hazardous decomposition products

Other decomposition products - No data available Hazardous decomposition products formed under fire conditions. - Carbon oxides In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation: No data available Dermal: No data available

LD50 Intraperitoneal - Mouse - 430 mg/kg

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation

Causes photosensitivity. Exposure to light can result in allergic reactions resulting in dermatologic lesions, which can vary from sunburnlike responses to edematous, vesiculated lesions, or bullae

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

on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

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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: CA9350000

Possible tumor promoter., Headache, Nausea, Weakness

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Blood -

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish LC50 - Lepomis macrochirus (Bluegill) - 0.001 mg/l - 96.0 h

Toxicity to daphnia and other aquatic invertebrates

EC50 - Daphnia magna (Water flea) - 0.10 mg/l - 48 h

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Indication of bioaccumulation.

Bioaccumulation Pimephales promelas (fathead minnow) - 42 d

- 0.01191 mg/l(Anthracene)

Bioconcentration factor (BCF): 649

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.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

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Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Anthracene)

Reportable Quantity (RQ): 5000 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.

(Anthracene)

Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (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.

SECTION 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:

Anthracene CAS-No. Revision Date 2007-07-01

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

Anthracene CAS-No. Revision Date 120-12-7 2007-07-01

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SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.0 Revision Date: 06/19/2019 Print Date: 06/29/2019

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SAFETY DATA SHEET

Version 6.2 Revision Date 03/12/2019 Print Date 06/28/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Antimony

Product Number : 266329
Brand : Aldrich
CAS-No. : 7440-36-0

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 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 # : +1-703-527-3887

SECTION 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

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

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 Toxic if swallowed.

H335 May cause respiratory irritation.

Precautionary statement(s)

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

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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.

P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/doctor.

Rinse mouth.

P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable

for breathing. Call a POISON CENTER/doctor if you feel unwell.

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

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : Sb

Molecular weight : 121.76 g/mol CAS-No. : 7440-36-0 EC-No. : 231-146-5

Component	Classification	Concentration
Antimony		
	Acute Tox. 3; STOT SE 3;	<= 100 %
	H301, H335	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 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.

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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

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Antimony oxide

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 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.

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.

SECTION 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. 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.

Air sensitive. Moisture sensitive. Handle and store under inert gas. Keep in a dry place.

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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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

components t	components with workplace control parameters					
Component	CAS-No.	Value	Control parameters	Basis		
Antimony	7440-36-0	TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits		
		TWA	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants		
		TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)		
	Remarks	Upper Res Skin irritat	piratory Tract ir ion	ritation		
		PEL	0.5 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: 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)

Millipore

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 N99 (US) or type P2 (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.

SECTION 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/range: 630 °C (1166 °F) - lit.

point/freezing point

(f) Initial boiling point 1,635 °C 2,975 °F - lit. and boiling range

g) Flash point ()Not applicable

h) Evaporation rate No data available

i) Flammability (solid, No data available gas)

j) Upper/lower flammability or

explosive limits

No data available

k) Vapour pressure No data availablel) Vapour density No data available

m) Relative density 6.69 g/cm3 at 25 °C (77 °F)

n) Water solubility No data available

o) Partition coefficient: Not applicable for inorganic substances

n-octanol/water



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p) Auto-ignition No data available temperature

q) Decomposition No da temperature

No data available

r) Viscosity No data availables) Explosive properties No data availablet) 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

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. - Antimony oxide Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 100 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

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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

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: CC4025000

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

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish LC50 - Cyprinodon variegatus (sheepshead minnow) - 6.2 - 8.3 mg/l

- 96.0 h

Remarks: No data available

12.2 Persistence and degradability

Biodegradability Result: - According to the results of tests of biodegradability this

product is not readily biodegradable.

Remarks: The methods for determining biodegradability are not

applicable to inorganic substances.

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



SECTION 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.

SECTION 14: Transport information

DOT (US)

UN number: 2871 Class: 6.1 Packing group: III

Proper shipping name: Antimony powder Reportable Quantity (RQ): 5000 lbs Poison Inhalation Hazard: No

IMDG

UN number: 2871 Class: 6.1 Packing group: III EMS-No: F-A, S-A

Proper shipping name: ANTIMONY POWDER

Marine pollutant : yes

IATA

UN number: 2871 Class: 6.1 Packing group: III

Proper shipping name: Antimony powder

SECTION 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 Antimony 7440-36-0 2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Antimony CAS-No. Revision Date

7440-36-0 2007-07-01

Antimony CAS-No. Revision Date 7440-36-0 2007-07-01

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New Jersey Right To Know Components

Antimony

CAS-No. 7440-36-0 Revision Date 2007-07-01

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.

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.2 Revision Date: 03/12/2019 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 4.13 Revision Date 09/12/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Arsenic

Product Number : 202657 Brand : Aldrich

Index-No. : 033-001-00-X

CAS-No. : 7440-38-2

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)

Acute toxicity, Oral (Category 4), H302 Acute toxicity, Inhalation (Category 3), H331 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)

H302 Harmful if swallowed. H331 Toxic if inhaled. 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.

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/ eye protection/ face

protection.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth.

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.

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 : As

 Molecular weight
 : 74.92 g/mol

 CAS-No.
 : 7440-38-2

 EC-No.
 : 231-148-6

 Index-No.
 : 033-001-00-X

Hazardous components

Component	Classification	Concentration
Arsenic		
	Acute Tox. 4; Acute Tox. 3;	90 - 100 %
	Carc. 1B; Aquatic Acute 1;	
	Aquatic Chronic 1; H302,	
	H331, H350, H410	

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.

Keep in a dry place.

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

	Compension with weinblace control parameters				
Component	CAS-No.	Value	Control	Basis	
			parameters		
Arsenic	7440-38-2	TWA	0.01 mg/m3	USA. ACGIH Threshold Limit Values	
				(TLV)	
	Remarks	Lung cancer			
		Substances for which there is a Biological Exposure Index or Indices			
		(see BEI® section)			
		Confirmed h	numan carcinoger	1	

С	0.0020 mg/m3	USA. NIOSH Recommended Exposure Limits	
Potentia See App	l Occupational Carcin pendix A	ogen	
15 minu	15 minute ceiling value		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological	Basis
				specimen	
	-	inorganic arsenic plus methylated metabolites	35µg As/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of the workweek (After four or five consecutive working days with exposure)			

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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form: powder a) Appearance

Colour: light grey, black

Odour No data available b) Odour Threshold No data available No data available d) Hq

Melting point/freezing

point

Melting point/range: 817 °C (1,503 °F) - lit.

f) Initial boiling point and

boiling range

613 °C (1,135 °F) - lit.

g) Flash point Not applicable h) Evaporation rate No data available Flammability (solid, gas) No data available j)

Upper/lower flammability or explosive limits No data available

k) Vapour pressure No data available Vapour density No data available

m) Relative density 5.727 g/mL at 25 °C (77 °F)

n) Water solubility No data available Partition coefficient: n-No data available

octanol/water

Auto-ignition temperature

No data available

Decomposition temperature

No data available

Viscosity No data available r) Explosive properties No data available 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

Heat Exposure to air may affect product quality.

10.5 Incompatible materials

Strong oxidizing agents

Hazardous decomposition products 10.6

Hazardous decomposition products formed under fire conditions. - Arsenic oxides Other decomposition products - No data available

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11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 763 mg/kg

Remarks: Behavioral: Ataxia. Diarrhoea

LD50 Oral - Mouse - 145 mg/kg

Remarks: Behavioral: Ataxia. Diarrhoea

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 Carcinogenicity

No data available

IARC: 1 - Group 1: Carcinogenic to humans (Arsenic)

NTP: Known - Known to be human carcinogen (Arsenic)

OSHA: OSHA specifically regulated carcinogen (Arsenic)

Reproductive toxicity

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: CG0525000

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 LC50 - Pimephales promelas (fathead minnow) - 9.9 mg/l - 96.0 h

Toxicity to daphnia and EC50 - Daphnia magna (Water flea) - 3.8 mg/l - 48 h

other aquatic invertebrates

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

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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: 1558 Class: 6.1 Packing group: II

Proper shipping name: Arsenic

Reportable Quantity (RQ): 1 lbsReportable Quantity (RQ): 1 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1558 Class: 6.1 Packing group: II EMS-No: F-A, S-A

Proper shipping name: ARSENIC

Marine pollutant:yes

IATA

UN number: 1558 Class: 6.1 Packing group: II

Proper shipping name: Arsenic

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 7440-38-2 2015-11-23

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Reportable Quantity D004 lbs

Massachusetts Right To Know Components

CAS-No. Revision Date
Arsenic 7440-38-2 2015-11-23

Pennsylvania Right To Know Components

CAS-No. Revision Date 7440-38-2 2015-11-23

CAS-No. Revision Date

Arsenic 7440-38-2 2015-11-23

New Jersey Right To Know Components

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CAS-No. Revision Date 7440-38-2 2015-11-23

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. CAS-No. Revision Date 2007-09-28

Arsenic

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
H302 Harmful if swallowed.
H331 Toxic if inhaled.
H350 May cause cancer.
H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.13 Revision Date: 09/12/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Barium

Product Number : 474711 Brand : Aldrich

CAS-No. : 7440-39-3

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 # : +1-703-527-3887

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 Do not allow contact with water.

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 to

extinguish.

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 : Ba

 Molecular weight
 : 137.33 g/mol

 CAS-No.
 : 7440-39-3

 EC-No.
 : 231-149-1

Hazardous components

Component	Classification	Concentration
Barium		
	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

Barium oxide

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.

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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 wetbrushing 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 combu formation should be taken into consideration before additional processing

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.

Store under inert gas.

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	
Barium	7440-39-3	TWA	0.500000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
	Remarks	Muscular sti	Eye, skin, & Gastrointestinal irritation Muscular stimulation Not classifiable as a human carcinogen		
		TWA	0.500000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants	
		TWA	0.500000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
		Eye irritation Muscular stimulation Skin irritation Gastrointestinal irritation Not classifiable as a human carcinogen			
		TWA	0.500000 mg/m3	USA. NIOSH Recommended Exposure Limits	
		TWA	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants	
		TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
			mulation	arcinogen	

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TWA	0.5 mg/m3	USA. NIOSH Recommended
		Exposure Limits

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 industria 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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

Form: Pieces a) Appearance Colour: grey

No data available c) Odour Threshold No data available

No data available d) pH

e) Melting point/freezing Melting point/range: 725 °C (1337 °F) - lit.

point

b) Odour

1,640 °C (2,984 °F) - lit. Initial boiling point and

boiling range

g) Flash point ()Not applicable h) Evaporation rate No data available

Aldrich- 474711 Page 4 of 8 i) Flammability (solid, gas) No data available

j) Upper/lower flammability or explosive limits No data available

k) Vapour pressure No data availablel) Vapour density No data available

m) Relative density 3.6 g/cm3 at 25 °C (77 °F)

n) Water solubility No data available
 o) Partition coefficient: n- No data available octanol/water

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

Oxidizing agents, Water, acids, Oxygen, Chlorinated solvents, Carbon dioxide (CO2), Halogens, Halogenated hydrocarbon, Alcohols, Sulphur compounds, Hydrogen sulfide gas

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Barium 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 availableBarium

Inhalation: No data available(Barium)
Dermal: No data available(Barium)

No data available(Barium)

Skin corrosion/irritation

No data available(Barium)

Serious eye damage/eye irritation

No data available(Barium)

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Respiratory or skin sensitisation

No data available(Barium)

Germ cell mutagenicity

No data available(Barium)

Carcinogenicity

This product is or contains a component that is not classifiable as to its classification.(Barium) (Barium)

(Barium)

Reproductive toxicity

No data available(Barium)

No data available(Barium)

Specific target organ toxicity - single exposure

No data available(Barium)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Barium)

Additional Information

RTECS: CQ8370000

Stomach/intestinal disorders, Nausea, Vomiting, Drowsiness, Dizziness, Gastrointestinal disturbance, Weakness, Tremors, Seizures.(Barium)

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Barium)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish mortality NOEC - Cyprinodon variegatus (sheepshead minnow) - 500 mg/l - 96

h(Barium)

LC50 - Cyprinodon variegatus (sheepshead minnow) - > 500 mg/l - 96

h(Barium)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Barium)

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 b 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: 1400 Class: 4.3 Packing group: II

Proper shipping name: Barium

Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1400 Class: 4.3 Packing group: II EMS-No: F-G, S-O

Proper shipping name: BARIUM

IATA

UN number: 1400 Class: 4.3 Packing group: II

Proper shipping name: Barium

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

Barium 7440-39-3 2007-07-01

SARA 311/312 Hazards

Reactivity Hazard

Massachusetts Right To Know Components

 Barium
 CAS-No.
 Revision Date

 2007-07-01
 2007-07-01

Pennsylvania Right To Know Components

CAS-No. Revision Date Barium 7440-39-3 2007-07-01

New Jersey Right To Know Components

CAS-No. Revision Date Barium 7440-39-3 2007-07-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H261 In contact with water releases flammable gases.

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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.1: W

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

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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), 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 : C₂₀H₁₂

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.	90 - 100 %
	1B; Repr. 1B; Aquatic Acute 1;	
	Aquatic Chronic 1; H317,	
	H340, H350, H360, H410	

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

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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

	Components with workplace control parameters				
Component	CAS-No.	Value	Control parameters	Basis	
	Remarks	(see BEI® se (PAHs)	ection), see BEI® f	a Biological Exposure Index or Indices or Polycyclic Aromatic Hydrocarbons 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				
			numan carcinoger	1			
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					
				e Z-1), coal tar pitch volatiles include			
		distillation re and other or 64742-93-4) standard	esidues of coal, pe ganic matter. As is not covered ur	bons which volatilize from the etroleum (excluding asphalt), wood, phalt (CAS 8052-42-4, and CAS and tar pitch volatiles'			
			fically regulated of				
		TWA	0.100000	USA. NIOSH Recommended			
			mg/m3	Exposure Limits			
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.					
		1.		ion			
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants			
		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

J						
Component	CAS-No.	Parameters	Value	Biological	Basis	

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		S	specimen	
-	1- Hydroxypyren e	l		ACGIH - Biological Exposure Indices (BEI)
Remarks	End of shift at er	nd of workwe	eek	
	1- Hydroxypyren e	l		ACGIH - Biological Exposure Indices (BEI)
	End of shift at er	nd of workwe	ek	

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

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No data available Odour Threshold c) d) рΗ No data available

Melting point/freezing Melting point/range: 177 - 180 °C (351 - 356 °F) e)

point

Initial boiling point and 495 °C (923 °F) f)

boiling range

Flash point No data available No data available h) Evaporation rate

Flammability (solid, gas) No data available

Upper/lower j) flammability or explosive limits

No data available

k) Vapour pressure No data available I) 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

Decomposition temperature

No data available

Viscosity No data available r) s) Explosive properties No data available 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

Conditions to avoid 10.4

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

Supelco - 48564 Page 6 of 9 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

EC50 - Daphnia magna (Water flea) - 0.25 mg/l - 48 h

other aquatic invertebrates

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

Supelco - 48564 Page 7 of 9

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

 Benzo[a]pyrene
 CAS-No.
 Revision Date

 50-32-8
 2007-03-01

Pennsylvania Right To Know Components

Benzo[a]pyrene CAS-No. Revision Date 50-32-8 2007-03-01

Benzo[a]pyrene CAS-No. Revision Date 50-32-8 2007-03-01

New Jersey Right To Know Components

CAS-No. Revision Date

Supelco - 48564 Page 8 of 9

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 50-32-8 1990-01-01

Benzo[a]pyrene

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

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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

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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[<|>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.

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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]acephenant hrylene	205-99-2	1- Hydroxypyren e		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

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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) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing Melting point/range: 163 - 165 °C (325 - 329 °F) - lit.

point

f) Initial boiling point and No data available

boiling range

g) Flash point No data available
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available

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Upper/lower No data available i) flammability or explosive limits k) Vapour pressure No data available Vapour density No data available m) Relative density No data available n) Water solubility No data available o) Partition coefficient: n-No data available octanol/water p) Auto-ignition No data available temperature q) Decomposition No data available temperature r) Viscosity No data available s) Explosive properties No data available

9.2 Other safety information

Oxidizing properties

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

No data available

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

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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 lmmobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h(Benz[e]acephenanthrylene)

invertebrates

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.

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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

Benz[e]acephenanthrylene CAS-No. Revision Date 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.

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H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Further information

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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

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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.

Supelco- 48492

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.

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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

ziologicai cocapational expecate initio					
Component	CAS-No.	Parameters	Value	Biological	Basis
				specimen	
Benzo[k]fluoranthen	207-08-9	1-		Urine	ACGIH - Biological
е		Hydroxypyren			Exposure Indices
		е			(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).

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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 laver 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

Form: crystalline a) Appearance

Colour: yellow

b) Odour No data available c) Odour Threshold No data available d) Hα 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 Flammability (solid, gas) No data available

Upper/lower

No data available

flammability or explosive limits

No data available Vapour pressure No data available Vapour density

Supelco- 48492 Page 4 of 8 m) Relative density No data available
 n) Water solubility No data available
 o) Partition coefficient: n- No data available

octanol/water

No data available

p) Auto-ignition temperature

TTO GATA ATAMADIO

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

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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)

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Reportable Quantity (RQ) 5000 lbs

nο

Poison Inhalation Hazard: No

IMDG

UN number: 3077 EMS-No: F-A. S-F Class: 9 Packing group: III

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
Renzo[k]fluoranthene		

Benzolklinorantnene

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

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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

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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

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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).

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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) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing Melting point/range: 157 - 159 °C (315 - 318 °F)

point

f) Initial boiling point and 437.6 °C (819.7 °F)

boiling range

g) Flash point No data available
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available
j) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure No data availablel) Vapour density No data availablem) Relative density No data available

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n) Water solubility No data available
 o) Partition coefficient: n- No data available octanol/water

p) Auto-ignition No data available temperature

q) Decomposition No data available temperature

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

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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.

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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

	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	CAS-No.	Revision Date
State of California to cause cancer. Benz[a]anthracene	56-55-3	2007-09-28
WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer. Benz[a]anthracene	56-55-3	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.

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H410 Very toxic to aquatic life with long lasting effects.

Further information

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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

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SAFETY DATA SHEET

Version 6.0 Revision Date 02/08/2019 Print Date 06/29/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : BENZO(G,H,I)PERYLENE, 98%

Product Number : B9009
Brand : Aldrich
CAS-No. : 191-24-2

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 # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Short-term (acute) aquatic hazard (Category 1), H400 Long-term (chronic) aquatic hazard (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.

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plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1,12-Benzoperylene

Formula : C₂₂H₁₂

Molecular weight : 276.33 g/mol
CAS-No. : 191-24-2
EC-No. : 205-883-8

Component	Classification	Concentration
Benzo[ghi]perylene Included in the Candidate (SVHC) according to Regulation (EC) No. 1907/20	<u> </u>	gh Concern
	Aquatic Acute 1; Aquatic Chronic 1; H400, H410 M-Factor - Aquatic Acute: 1,000 - Aquatic Chronic: 1,000	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 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

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SECTION 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

SECTION 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.

SECTION 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.

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

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Component	CAS-No.	Value	Control	Basis
			parameters	
Benzo[ghi]perylen e	191-24-2	PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
	Remarks	Coal tar pitch volatiles (benzene or cyclohexane-soluble fraction) include fused polycyclic hydrocarbons (some which are known carcinogens) which volatilize from the distillation residues of coal, petroleum (excluding asph wood, and other organic matter. Asphalt (CAS 8052-4: and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard.		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzo[ghi]peryle ne	191-24-2	1- Hydroxypyr ene	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift a	End of shift at end of workweek		
		3- hydroxyben zo(a)pyrene		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

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)

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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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b) Odourc) Odour Thresholddata availableNo data available

d) pH No data available

e) Melting Melting point/range: 277 - 279 °C (531 - 534 °F) - lit. point/freezing point

f) Initial boiling point > 500 °C > 932 °F - lit. and boiling range

g) Flash point ()No data available
h) Evaporation rate No data available
i) Flammability (solid No data available

i) Flammability (solid, No data available gas)

j) Upper/lower No data available flammability or

k) Vapour pressure No data availablel) Vapour density No data availablem) Relative density No data available

n) Water solubility insoluble

o) Partition coefficient: log Pow: 6.22 at 25 °C (77 °F)

n-octanol/water

explosive limits



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p) Auto-ignition No data available temperature

q) Decomposition

No data available

temperature

r) Viscosity No data availables) Explosive properties No data availablet) 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

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

SECTION 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

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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

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.

SECTION 12: Ecological information

12.1 Toxicity

No data available

Toxicity to daphnia and other aquatic invertebrates

Toxicity to algae

static test EC50 - Daphnia magna (Water flea) - 0.0002 mg/l - 48 h

Growth rate EC10 - Pseudokirchneriella subcapitata (green algae) - >

0.0016 mg/l - 72 h

12.2 Persistence and degradability

Biodegradability Result: - Not rapidly biodegradable

Remarks: 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

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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.

SECTION 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.

SECTION 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.

(Benzo[ghi]perylene) Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s.

(Benzo[ghi]perylene) **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.

SECTION 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:

Benzo[ghi]perylene CAS-No. Revision Date 2015-11-23

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

Benzo[ghi]perylene CAS-No. Revision Date 2015-11-23

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Pennsylvania Right To Know Components

Benzo[ghi]perylene CAS-No. Revision Date 191-24-2 2015-11-23

California Prop. 65 Components

, which is/are known to the State of California to CAS-No. Revision Date cause cancer. For more information go to 191-24-2 2007-09-28 www.P65Warnings.ca.gov.Benzo[ghi]perylene

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.0 Revision Date: 02/08/2019 Print Date: 06/29/2019

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SAFETY DATA SHEET

Version 4.8 Revision Date 01/11/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Beryllium

Product Number : 378135 Brand : Aldrich

CAS-No. : 7440-41-7

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 2), H330

Skin irritation (Category 2), H315 Eye irritation (Category 2A), H319 Skin sensitisation (Category 1), H317

Carcinogenicity (Category 1B), H350

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Specific target organ toxicity - repeated exposure (Category 1), H372

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 Toxic if swallowed. H315 Causes skin irritation.

H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.

H330 Fatal if inhaled.

H335 May cause respiratory irritation.

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

Aldrich - 378135

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. Wash skin thoroughly after handling. P264 Do not eat, drink or smoke when using this product. P270 P271 Use only outdoors or in a well-ventilated area. P272 Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/ protective clothing/ eye protection/ face P280 protection. P284 Wear respiratory protection. P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse IF ON SKIN: Wash with plenty of soap and water. P302 + P352 P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove P305 + P351 + P338 contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/ attention. P308 + P313 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. P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

P501

Formula : Be

Molecular weight : 9.01 g/mol CAS-No. : 7440-41-7 EC-No. : 231-150-7

Hazardous components

Component	Classification	Concentration
Berylium foil		
	Acute Tox. 3; Acute Tox. 2;	90 - 100 %
	Skin Irrit. 2; Eye Irrit. 2A; Skin	
	Sens. 1; Carc. 1B; STOT SE	
	3; STOT RE 1; H301, H315,	
	H317, H319, H330, H335,	
	H350, H372	

Dispose of contents/ container to an approved waste disposal plant.

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.

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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 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.

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	Basis	
			parameters		
Berylium foil	7440-41-7	TWA	2.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		CEIL	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Peak	25.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		TWA	2.000000microg	USA. Occupational Exposure Limits	
			ram per cubic	(OSHA) - Table Z-2	
	Remarks	Z27.29-1970			
		CEIL	5.000000microg ram per cubic	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		707.00.4070	meter		
		Z27.29-1970		11104 0 " 15 1: "	
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970			
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
		Confirmed h	· · ·	ylliosis)	
		С	0.000500 mg/m3	USA. NIOSH Recommended Exposure Limits	
		Potential Oc	cupational Carcino		
		See Append			
		See Table Z	-2		
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970			
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970		1	
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
		Beryllium sensitization Chronic beryllium disease (berylliosis)			

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1	1					
			closed are those for which changes			
		are proposed in the NIC				
		See Notice of Intended Changes (NIC)				
	Confirmed	Confirmed human carcinogen				
	Danger of	cutaneous absorptio	n			
	Sensitizer					
	С	0.000500	USA. NIOSH Recommended			
		mg/m3	Exposure Limits			
	Potential (Occupational Carcino	ogen			
	See Appe					
	See Table					
	TWA	2microgram per	USA. Occupational Exposure Limits			
		cubic meter	(OSHA) - Table Z-2			
	Z27.29-19	970				
	CEIL	5microgram per	USA. Occupational Exposure Limits			
		cubic meter	(OSHA) - Table Z-2			
	Z27.29-19	970				
	Peak	25microgram	USA. Occupational Exposure Limits			
		per cubic meter	(OSHA) - Table Z-2			
	Z27.29-19	970	,			
	С	0.0005 mg/m3	USA. NIOSH Recommended			
			Exposure Limits			
	Potential (Occupational Carcino	ogen			
	See Appe					
	PEL	0.0002 mg/m3	California permissible exposure			
			limits for chemical contaminants			
			(Title 8, Article 107)			
	С	0.025 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: 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

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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.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: powder

Colour: grey

Odour odourless

Odour Threshold No data available c) No data available d) pН

Melting point/freezing e)

point

Melting point/range: 1,278 °C (2,332 °F) - lit.

Initial boiling point and

boiling range

2,970 °C (5,378 °F) - lit.

g) Flash point No data available Evaporation rate No data available

Flammability (solid, gas) No data available i)

Upper/lower flammability or explosive limits No data available

Vapour pressure No data available Vapour density No data available

m) Relative density 1.85 g/cm3 at 25 °C (77 °F)

n) Water solubility No data available Partition coefficient: n-No data available

octanol/water

p) Auto-ignition temperature

No data available

Decomposition temperature

No data available

r) Viscosity No data available No data available Explosive properties Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

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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

Alkali metals

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Beryllium 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 - 0.496 mg/kg

Remarks: Liver: Hepatitis (hepatocellular necrosis), zonal.

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

Hamster Lungs

Result: negative

Carcinogenicity

Carcinogenicity - Rat - Intratracheal

Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma.

Carcinogenicity - Rabbit - Intravenous

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Musculoskeletal:Tumors.

Possible human carcinogen

IARC: 1 - Group 1: Carcinogenic to humans (Berylium foil)

NTP: Known - Known to be human carcinogen (Berylium foil)

Known - Known to be human carcinogenThe reference note has been added by TD based on

the background information of the NTP. (Berylium foil)

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

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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: DS1750000

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)

UN number: 1567 Class: 6.1 (4.1) Packing group: II

Proper shipping name: Beryllium, powder

Reportable Quantity (RQ): 10 lbs Poison Inhalation Hazard: No

IMDG

UN number: 1567 Class: 6.1 (4.1) Packing group: II EMS-No: F-G, S-G

Proper shipping name: BERYLLIUM POWDER

IATA

UN number: 1567 Class: 6.1 (4.1) Packing group: II

Proper shipping name: Beryllium powder

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

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The following components are subject to reporting levels established by SARA Title III, Section 313:

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

Pennsylvania Right To Know Components

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

New Jersey Right To Know Components

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the CAS-No. Revision Date State of California to cause cancer. 7440-41-7 2008-10-10 Berylium foil

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity
Carc. Carcinogenicity
Eye Irrit. Eye irritation
H301 Toxic if swallowed.
H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H330 Fatal if inhaled.

H335 May cause respiratory irritation.

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

Skin Irrit. Skin irritation
Skin Sens. Skin sensitisation

HMIS Rating

Health hazard: 4
Chronic Health Hazard: *
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 4
Fire Hazard: 3
Reactivity Hazard: 3

Further information

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Preparation Information Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Revision Date: 01/11/2018 Print Date: 06/28/2019 Version: 4.8

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SAFETY DATA SHEET

Version 5.9 Revision Date 05/25/2016 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Bis(2-ethylhexyl) phthalate

Product Number : P6699
Brand : Sigma

Index-No. : 607-317-00-9

CAS-No. : 117-81-7

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)

Reproductive toxicity (Category 1B), H360

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)

H360 May damage fertility or the unborn child.

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

Endocrine disrupting chemical(s)

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3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : C₂₄H₃₈O₄

Molecular weight : 390.56 g/mol
CAS-No. : 117-81-7

EC-No. : 204-211-0
Index-No. : 607-317-00-9

Registration number : 01-2119484611-38-XXXX

Hazardous components

Component	Classification	Concentration		
bis(2-Ethylhexyl) phthalate Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)				
	Repr. 1B; H360	<= 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.

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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

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
bis(2-Ethylhexyl)	117-81-7	TWA	5.000000	USA. ACGIH Threshold Limit Values
phthalate			mg/m3	(TLV)
	Remarks	Lower Resp	iratory Tract irritation	on
		Confirmed a	nimal carcinogen v	with unknown relevance to humans
		TWA	5.000000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		Potential Occupational Carcinogen		
		See Append	ix A	
		ST	10.000000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		Potential Oc	cupational Carcino	ogen
		See Append	ix A	
		TWA	5.000000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
		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.

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Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.2 mm Break through time: 480 min

Material tested: Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

Splash contact Material: Nitrile rubber

Minimum laver thickness: 0.11 mm Break through time: 120 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 respirator with multipurpose 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.

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 No data available d) рΗ e) Melting point/freezing -50.0 °C (-58.0 °F)

point

Initial boiling point and

boiling range

384.0 °C (723.2 °F)

g) Flash point 207.0 °C (404.6 °F) - closed cup

h) Evaporation rate No data available Flammability (solid, gas) No data available

Upper/lower Lower explosion limit: 0.3 %(V)

flammability or explosive limits

1.6 hPa (1.2 mmHg) at 93.0 °C (199.4 °F) k) Vapour pressure

Vapour density No data available

m) Relative density 0.98 g/cm3 n) Water solubility insoluble

o) Partition coefficient: n-

No data available

octanol/water

p) Auto-ignition 390.0 °C (734.0 °F)

Sigma - P6699 Page 4 of 8 temperature

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

LD50 Oral - Rat - 30,000 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 25,000 mg/kg

No data available

Skin corrosion/irritation

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

Maximisation Test - Guinea pig

Result: Does not cause skin sensitisation.

(OECD Test Guideline 406)

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.

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IARC: 2B - Group 2B: Possibly carcinogenic to humans (bis(2-Ethylhexyl) phthalate)

NTP: Reasonably anticipated to be a human carcinogen (bis(2-Ethylhexyl) phthalate)

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

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: TI0350000

Effects due to ingestion may include:, Gastrointestinal disturbance

Kidney -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - > 0.67 mg/l - 96 h

LC50 - Oncorhynchus mykiss (rainbow trout) - > 0.32 mg/l - 96 h

LC50 - Cyprinodon variegatus (sheepshead minnow) - > 0.17 mg/l - 96 h

LC50 - Lepomis macrochirus (Bluegill) - > 0.20 mg/l - 96 h

NOEC - other fish - > 0.3 mg/l - 96 h

Toxicity to daphnia and

other aquatic invertebrates

Immobilization EC50 - Daphnia magna (Water flea) - > 0.16 mg/l - 48 h

12.2 Persistence and degradability

Biodegradability Result: - Readily biodegradable

(OECD Test Guideline 301)

12.3 Bioaccumulative potential

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 100 d

- 0.014 mg/l

Bioconcentration factor (BCF): 113 Remarks: 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

No data available

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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: 3082 Packing group: III Class: 9

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (bis(2-Ethylhexyl) phthalate)

Reportable Quantity (RQ): 100 lbs

Poison Inhalation Hazard: No

IMDG

Not dangerous goods

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

The following components are subject to reporting leve	Is established by SARA Title III,	Section 313:
	CAS-No.	Revision Date
bis(2-Ethylhexyl) phthalate	117-81-7	2007-07-01

SARA 311/312 Hazards

bis(2-Ethylhexyl) phthalate

Chronic Health Hazard

Massachusetts Right To Know Components		
·	CAS-No.	Revision Date
bis(2-Ethylhexyl) phthalate	117-81-7	2007-07-01
Pennsylvania Right To Know Components		
	CAS-No.	Revision Date
bis(2-Ethylhexyl) phthalate	117-81-7	2007-07-01
New Jersey Right To Know Components		
	CAS-No.	Revision Date
bis(2-Ethylhexyl) phthalate	117-81-7	2007-07-01
California Prop. 65 Components		
WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer. bis(2-Ethylhexyl) phthalate	117-81-7	2009-02-01
WARNING: This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause birth defects or other reproductive	117-81-7	2009-02-01

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16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H360 May damage fertility or the unborn child.

Repr. Reproductive toxicity

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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.9 Revision Date: 05/25/2016 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 5.5 Revision Date 05/24/2016 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzyl butyl phthalate

 Product Number
 : 308501

 Brand
 : Aldrich

 Index-No.
 : 607-430-00-3

CAS-No. : 85-68-7

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)

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)

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.

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.

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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 : C₁₉H₂₀O₄

Molecular weight : 312.36 g/mol
CAS-No. : 85-68-7

EC-No. : 201-622-7
Index-No. : 607-430-00-3

Hazardous components

Tiuzui dede eem periente		
Component	Classification	Concentration
Benzyl butyl phthalate Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
	Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H360, 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

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

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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 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): 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: 0.4 mm Break through time: 480 min

Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nature latex/chloroprene Minimum layer thickness: 0.6 mm Break through time: 60 min

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Material tested:Lapren® (KCL 706 / Aldrich Z677558, 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 respirator with multipurpose 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

No data available d) pH

e) Melting point/freezing

point

Melting point/freezing point: < -34.99 °C (< -30.98 °F)

Initial boiling point and

boiling range

370 °C (698 °F)

g) Flash point 113.0 °C (235.4 °F) - closed cup

h) Evaporation rate No data available Flammability (solid, gas) No data available Upper/lower

flammability or explosive limits No data available

19.2 hPa (14.4 mmHg) at 250.0 °C (482.0 °F) k) Vapour pressure

0.3 hPa (0.2 mmHg) at 150.0 °C (302.0 °F)

Vapour density No data available

1.1 g/cm3 at 25 °C (77 °F) m) Relative density

n) Water solubility 0.00269 g/l at 25 °C (77 °F) - OECD Test Guideline 105 - slightly soluble

o) Partition coefficient: n-

octanol/water

log Pow: 4.91 at 20 °C (68 °F)

p) Auto-ignition 232.0 °C (449.6 °F)

temperature

g) Decomposition No data available

temperature

Viscosity No data available

s) Explosive properties No data available

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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, Strong bases

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 - 2,330 mg/kg

(OECD Test Guideline 401)

Inhalation: No data available

LD50 Dermal - Rabbit - > 10,000 mg/kg

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

- Guinea pig

Result: Does not cause skin sensitisation.

Germ cell mutagenicity

Ames test S. typhimurium Result: negative

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.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Benzyl butyl phthalate)

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.

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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

Presumed human reproductive toxicant

Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

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

Repeated dose

Rat - male - Oral - NOAEL: 550 mg/kg

toxicity

RTECS: TH9990000

May cause endocrine disruption.

pancreas -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Lepomis macrochirus (Bluegill) - 1.7 mg/l - 96.0 h

NOEC - Oncorhynchus mykiss (rainbow trout) - 0.48 mg/l - 96.0 h

flow-through test LC50 - Pimephales promelas (fathead minnow) - 2.1 mg/l -

96 h

(OECD Test Guideline 203)

Toxicity to daphnia and

other aquatic invertebrates

static test LC50 - Daphnia magna (Water flea) - 1.8 mg/l - 48 h

Toxicity to algae Growth inhibition EC50 - Desmodesmus subspicatus (green algae) - 0.31 mg/l

- 72 h

(OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 14 d

Result: 81 % - Readily biodegradable

12.3 Bioaccumulative potential

Bioaccumulation Lepomis macrochirus (Bluegill) - 21 d

- 0.00973 mg/l

Bioconcentration factor (BCF): 663

12.4 Mobility in soil

No data available

2.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

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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.

Avoid release to the 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.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3082 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Benzyl butyl phthalate)

Reportable Quantity (RQ): 100 lbs

Marine pollutant:yes

Poison Inhalation Hazard: No

IMDG

UN number: 3082 Class: 9 Packing group: III EMS-No: F-A, S-F

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Benzyl butyl phthalate)

Marine pollutant:yes

IATA

UN number: 3082 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Benzyl butyl phthalate)

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

Benzyl butyl phthalate

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
Benzyl butyl phthalate	85-68-7	1993-04-24
Pennsylvania Right To Know Components		
	CAS-No.	Revision Date
Benzyl butyl phthalate	85-68-7	1993-04-24
New Jersey Right To Know Components		
	CAS-No.	Revision Date
Benzyl butyl phthalate	85-68-7	1993-04-24
California Prop. 65 Components		
WARNING: This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause birth defects or other reproductive	85-68-7	2007-09-28
harm.		
Benzyl butyl phthalate		
WARNING: This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause birth defects or other reproductive	85-68-7	2007-09-28
harm.		

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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

H360 May damage fertility or the unborn child.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Repr. Reproductive toxicity

HMIS Rating

Health hazard: 0
Chronic Health Hazard: *
Flammability: 1
Physical Hazard 0

NFPA Rating

Health hazard: 1
Fire Hazard: 1
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.5 Revision Date: 05/24/2016 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 4.8 Revision Date 01/11/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Beryllium

Product Number : 378135 Brand : Aldrich

CAS-No. : 7440-41-7

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 2), H330

Skin irritation (Category 2), H315 Eye irritation (Category 2A), H319 Skin sensitisation (Category 1), H317

Carcinogenicity (Category 1B), H350

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Specific target organ toxicity - repeated exposure (Category 1), H372

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 Toxic if swallowed. H315 Causes skin irritation.

H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.

H330 Fatal if inhaled.

H335 May cause respiratory irritation.

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

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. Wash skin thoroughly after handling. P264 Do not eat, drink or smoke when using this product. P270 P271 Use only outdoors or in a well-ventilated area. P272 Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/ protective clothing/ eye protection/ face P280 protection. P284 Wear respiratory protection. P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse IF ON SKIN: Wash with plenty of soap and water. P302 + P352 P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove P305 + P351 + P338 contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/ attention. P308 + P313 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. P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

P501

Formula : Be

Molecular weight : 9.01 g/mol CAS-No. : 7440-41-7 EC-No. : 231-150-7

Hazardous components

Component	Classification Concentration	
Berylium foil		
	Acute Tox. 3; Acute Tox. 2;	90 - 100 %
	Skin Irrit. 2; Eye Irrit. 2A; Skin	
	Sens. 1; Carc. 1B; STOT SE	
	3; STOT RE 1; H301, H315,	
	H317, H319, H330, H335,	
	H350, H372	

Dispose of contents/ container to an approved waste disposal plant.

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.

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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 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.

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	Basis	
			parameters		
Berylium foil	7440-41-7	TWA	2.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		CEIL	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Peak	25.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		TWA	2.00000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
	Remarks	Z27.29-1970		<u> </u>	
	rtemante	CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970			
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970			
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
		Confirmed h	nsitization rllium disease (bery uman carcinogen utaneous absorptio	,	
		С	0.000500 mg/m3	USA. NIOSH Recommended Exposure Limits	
			tential Occupational Carcinogen e Appendix A		
		See Table Z			
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		TWA	2.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970			
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970			
		CEIL	5.000000microg ram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970	·		
		Peak	25.000000micro gram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2	
		Z27.29-1970)		
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
		Beryllium sensitization Chronic beryllium disease (berylliosis)			

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1	1			
		Adopted values or notations enclosed are those for which changes		
		are proposed in the NIC		
		See Notice of Intended Changes (NIC)		
	Confirmed	Confirmed human carcinogen		
	Danger of	Danger of cutaneous absorption		
	Sensitizer	Sensitizer		
	С	0.000500	USA. NIOSH Recommended	
		mg/m3	Exposure Limits	
	Potential	Occupational Carcino	gen	
	See Appe			
	See Table			
	TWA	2microgram per	USA. Occupational Exposure Limits	
		cubic meter	(OSHA) - Table Z-2	
	Z27.29-19	Z27.29-1970		
	CEIL	5microgram per	USA. Occupational Exposure Limits	
		cubic meter	(OSHA) - Table Z-2	
	Z27.29-19	970		
	Peak	25microgram	USA. Occupational Exposure Limits	
		per cubic meter	(OSHA) - Table Z-2	
	Z27.29-19	970		
	С	0.0005 mg/m3	USA. NIOSH Recommended	
			Exposure Limits	
	Potential	Potential Occupational Carcinogen		
		See Appendix A		
	PEL	0.0002 mg/m3	California permissible exposure	
			limits for chemical contaminants	
			(Title 8, Article 107)	
	С	0.025 mg/m3	California permissible exposure	
		3. 3.	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: 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

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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.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: powder

Colour: grey

Odour odourless

Odour Threshold No data available c) No data available d) pН

Melting point/freezing e)

point

Melting point/range: 1,278 °C (2,332 °F) - lit.

Initial boiling point and

boiling range

2,970 °C (5,378 °F) - lit.

g) Flash point No data available Evaporation rate No data available Flammability (solid, gas) No data available i)

Upper/lower flammability or explosive limits No data available

Vapour pressure No data available Vapour density No data available

m) Relative density 1.85 g/cm3 at 25 °C (77 °F)

n) Water solubility No data available Partition coefficient: n-No data available

octanol/water

p) Auto-ignition temperature

No data available

Decomposition temperature

No data available

r) Viscosity No data available No data available Explosive properties Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

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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

Alkali metals

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Beryllium 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 - 0.496 mg/kg

Remarks: Liver: Hepatitis (hepatocellular necrosis), zonal.

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

Hamster Lungs

Result: negative

Carcinogenicity

Carcinogenicity - Rat - Intratracheal

Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma.

Carcinogenicity - Rabbit - Intravenous

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Musculoskeletal:Tumors.

Possible human carcinogen

IARC: 1 - Group 1: Carcinogenic to humans (Berylium foil)

NTP: Known - Known to be human carcinogen (Berylium foil)

Known - Known to be human carcinogenThe reference note has been added by TD based on

the background information of the NTP. (Berylium foil)

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

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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: DS1750000

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)

UN number: 1567 Class: 6.1 (4.1) Packing group: II

Proper shipping name: Beryllium, powder

Reportable Quantity (RQ): 10 lbs Poison Inhalation Hazard: No

IMDG

UN number: 1567 Class: 6.1 (4.1) Packing group: II EMS-No: F-G, S-G

Proper shipping name: BERYLLIUM POWDER

IATA

UN number: 1567 Class: 6.1 (4.1) Packing group: II

Proper shipping name: Beryllium powder

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

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The following components are subject to reporting levels established by SARA Title III, Section 313:

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

Pennsylvania Right To Know Components

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

New Jersey Right To Know Components

Berylium foil CAS-No. Revision Date 7440-41-7 1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the CAS-No. Revision Date State of California to cause cancer. 7440-41-7 2008-10-10 Berylium foil

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity
Carc. Carcinogenicity
Eye Irrit. Eye irritation
H301 Toxic if swallowed.
H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H330 Fatal if inhaled.

H335 May cause respiratory irritation.

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

Skin Irrit. Skin irritation
Skin Sens. Skin sensitisation

HMIS Rating

Health hazard: 4
Chronic Health Hazard: *
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 4
Fire Hazard: 3
Reactivity Hazard: 3

Further information

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Preparation Information Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Revision Date: 01/11/2018 Print Date: 06/28/2019 Version: 4.8

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SAFETY DATA SHEET

Version 4.9 Revision Date 05/24/2016 Print Date 06/22/2019

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.

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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
Coloium		
Calcium	1100	1000/
	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.

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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 wetbrushing 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

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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) Odourc) Odour Thresholdd) pHNo data availableNo 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

 i) Upper/lower flammability or explosive limits No data available

k) Vapour pressure No data availablel) Vapour density No data available

m) Relative density 1.54 g/mL at 25 °C (77 °F)

n) Water solubility No data availableo) Partition coefficient: n- No data available

octanol/water

No data available

p) Auto-ignition temperature

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

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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.

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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

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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 7440-70-2 1993-04-24

Pennsylvania Right To Know Components

CAS-No. Revision Date 7440-70-2 1993-04-24

New Jersey Right To Know Components

CAS-No. Revision Date 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.1: W

Further information

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Preparation Information Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.9 Revision Date: 05/24/2016 Print Date: 06/22/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 05/28/2017 Print Date 06/29/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Carbazole

Product Number : C5132 Brand : Sigma

CAS-No. : 86-74-8

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 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 # : +1-703-527-3887

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

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 Warning

Hazard statement(s)

H351 Suspected of causing cancer.

H413 May cause long lasting harmful effects 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.

P273 Avoid release to the environment.

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 : C₁₂H₉N Molecular weight : 167.21 g/mol CAS-No. : 86-74-8 EC-No. : 201-696-0

Hazardous components

Component	Classification Concentration		
Carbazole			
	Carc. 2; Aquatic Chronic 4;	<= 100 %	
	H351, H413		

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, Nitrogen oxides (NOx)

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

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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 combu formation should be taken into consideration before additional processing Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

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)

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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 industria 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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

Form: powder a) Appearance

Colour: beige

No data available b) Odour Odour Threshold No data available

No data available d) Hq

Melting point/freezing e) Melting point/range: 243 - 246 °C (469 - 475 °F)

point

Initial boiling point and f) 355 °C (671 °F)

boiling range

g) Flash point 220.0 °C (428.0 °F) - closed cup

h) Evaporation rate No data available

Flammability (solid, gas) The product is not flammable.

No data available Upper/lower

flammability or explosive limits

k) Vapour pressure 533 hPa at 323 °C (613 °F)

Vapour density No data available

m) Relative density 1.1 g/cm3 at 18 °C (64 °F) 0.00091 g/l at 25 °C (77 °F) n) Water solubility log Pow: 3.72 at 22 °C (72 °F) o) Partition coefficient: n-

octanol/water

> 600 °C (> 1112 °F) at 1,013 hPa

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p) Auto-ignition temperature

No data available q) Decomposition

temperature

r) Viscosity No data available

s) Explosive properties No data available Oxidizing properties No data available

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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

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NOx)

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

LD0 Oral - Rat - > 16,000 mg/kg(Carbazole)

(OECD Test Guideline 401)

Inhalation: No data available(Carbazole)

Dermal: No data available(Carbazole)

No data available(Carbazole)

Skin corrosion/irritation

Skin - Rabbit(Carbazole)

Result: No skin irritation

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit(Carbazole)

Result: No eye irritation

Respiratory or skin sensitisation

No data available(Carbazole)

Germ cell mutagenicity

No data available(Carbazole)

Carcinogenicity

Limited evidence of carcinogenicity in animal studies(Carbazole)

(Carbazole)

(Carbazole)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Carbazole)

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(Carbazole)

No data available(Carbazole)

Specific target organ toxicity - single exposure

No data available(Carbazole)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Carbazole)

Additional Information

RTECS: FE3150000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Carbazole)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - > 0.93 mg/l - 96.0

h(Carbazole)

Remarks: No toxicity at the limit of solubility

Toxicity to daphnia and

other aquatic

EC50 - Daphnia magna (Water flea) - 2.30 - 4.90 mg/l - 48 h(Carbazole)

Remarks: No toxicity at the limit of solubility

Toxicity to algae

invertebrates

Growth inhibition NOEC - Scenedesmus acuminatus - > 0.4 mg/l - 96

h(Carbazole)

Remarks: No toxicity at the limit of solubility

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Bioaccumulation Cyprinus carpio (Carp) - 42 d

- 0.05 mg/l(Carbazole)

Bioconcentration factor (BCF): 241 Cyprinus carpio (Carp) - 42 d - 0.005 mg/l(Carbazole)

Bioconcentration factor (BCF): 200

12.4 Mobility in soil

No data available(Carbazole)

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.

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 chem scrubber. 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

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Carbazole)

Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Carbazole)

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

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Carbazole	86-74-8	2009-07-17
New Jersey Right To Know Components		
	CAS-No.	Revision Date
Carbazole	86-74-8	2009-07-17
California Prop. 65 Components		
WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer.	86-74-8	2007-09-28
Carbazole		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

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H351 Suspected of causing cancer.

H413 May cause long lasting harmful effects 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
Health hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.0 Revision Date: 05/28/2017 Print Date: 06/29/2019

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SAFETY DATA SHEET

Version 6.3 Revision Date 04/05/2019 Print Date 06/28/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Chromium

Product Number : 374849
Brand : Aldrich
CAS-No. : 7440-47-3

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 # : +1-703-527-3887

SECTION 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

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : Cr

Molecular weight : 52.00 g/mol CAS-No. : 7440-47-3 EC-No. : 231-157-5

Component Classification Concentration

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Chromium	
	<= 100 %

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice

Move out of dangerous area.

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

SECTION 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

Chromium oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 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.

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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.

SECTION 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. 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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Chromium	7440-47-3	PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
	Remarks	see Section	ıs 1532.2, 5206	& 8359
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Skin irritati Adopted va changes ard See Notice	ted values or notations enclosed are those for which ges are proposed in the NIC lotice of Intended Changes (NIC) lassifiable as a human carcinogen	

8.2 Exposure controls

Appropriate engineering controls

General industrial hygiene practice.

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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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: chips

Colour: light grey

b) Odour odourless

c) Odour Threshold No data availabled) pH No data available

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e) Melting point/range: 1,857 °C (3,375 °F) - lit. point/freezing point

f) Initial boiling point 2,672 °C 4,842 °F - lit. and boiling range

g) Flash point ()Not applicableh) Evaporation rate No data availablei) Flammability (solid, No data available

gas)

explosive limits

j)

Upper/lower No data available flammability or

k) Vapour pressure No data availablel) Vapour density No data available

m) Relative density 7.14 g/mL at 25 °C (77 °F)

 n) Water solubility No data available
 o) Partition coefficient: No data available n-octanol/water

p) Auto-ignition No data available temperature

q) Decomposition No data available temperature

r) Viscosity No data availables) Explosive properties No data availablet) 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

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

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Chromium oxides Other decomposition products - No data available In the event of fire: see section 5

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SECTION 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.

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: GB4200000

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

SECTION 12: Ecological information

12.1 Toxicity

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Toxicity to fish LC50 - Cyprinus carpio (Carp) - 14.3 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates

EC50 - Daphnia magna (Water flea) - 0.07 mg/l - 48 h

12.2 Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 30 d

- 50 μg/I(Chromium)

Bioconcentration factor (BCF): 1.03 - 1.22

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

SECTION 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.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. ()

Reportable Quantity (RQ): 5000 lbs Reportable Quantity (RQ): 10 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.

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SECTION 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 Chromium 7440-47-3 2007-07-01

SARA 311/312 Hazards

Chronic Health Hazard

Reportable Quantity D007 lbs

Massachusetts Right To Know Components

Chromium CAS-No. Revision Date 2007-07-01

Pennsylvania Right To Know Components

Chromium CAS-No. Revision Date 7440-47-3 2007-07-01

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.

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.3 Revision Date: 04/05/2019 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 5.10 Revision Date 01/10/2018 Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : CHRYSENE, 98%

Product Number : 245186 Brand : 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)

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.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : C₁₈H₁₂ Molecular weight : 228.29 g/mol

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 inhalad

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.

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 Indice (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbon (PAHs) Exposure by all routes should be carefully controlled to levels as log 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
		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		

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See App	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- Hydroxypyren e		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

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Colour: white, light yellow

b) Odour
c) Odour Threshold
d) pH
e) Melting point/freezing point

No data available
No data available
No data available
253.0 °C (487.4 °F)

f) Initial boiling point and boiling range

448.0 °C (838.4 °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

o) Partition coefficient: noctanol/water

log Pow: 5.73

insoluble

p) Auto-ignition temperature

n) Water solubility

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 In the event of fire: see section 5

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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: 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 EC50 - Daphnia magna (Water flea) - 1.90 mg/l - 2 h other aquatic invertebrates

12.2 Persistence and degradability

No data available

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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.

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

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

3	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

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New Jersey Right To Know Components

CAS-No. Revision Date Chrysene 218-01-9 1994-04-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. CAS-No. Revision Date 2007-09-28

Chrysene

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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.10 Revision Date: 01/10/2018 Print Date: 06/22/2019

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SAFETY DATA SHEET

Version 3.11 Revision Date 05/23/2016 Print Date 07/17/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Cobalt

Product Number : 697745 Brand : Aldrich

CAS-No. : 7440-48-4

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)

Respiratory sensitisation (Category 1), H334 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)

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P273 Avoid release to the environment.

P285 In case of inadequate ventilation wear respiratory protection.

P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep

at rest in a position comfortable for breathing.

P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.

P391 Collect spillage.

P501 Dispose of contents/ container to an approved waste disposal plant.

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2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Synonyms : Carbon coated cobalt nanoparticles

magnetic cobalt

Formula : Co

Molecular weight : 58.93 g/mol

Hazardous components

Component		Classification	Concentration
Cobalt			
CAS-No. EC-No. Index-No.	7440-48-4 231-158-0 027-001-00-9	Resp. Sens. 1; Skin Sens. 1; Aquatic Chronic 4; H317, H334, H413	<= 100 %
Graphene-like carbo	n		
		Eye Irrit. 2A; STOT SE 3; H319, H335	>= 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. 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

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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.

Heat sensitive. 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
Cobalt	7440-48-4	TWA	0.100000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.020000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	(see BEI® s	effects for which there is a ection)	a Biological Exposure Index or Indices

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TWA	0.050000 mg/m3	USA. NIOSH Recommended Exposure Limits
TWA	0.100000	USA. Occupational Exposure Limits
	mg/m3	(OSHA) - Table Z-1 Limits for Air Contaminants
TWA	0.050000	USA. NIOSH Recommended
	mg/m3	Exposure Limits
TWA	0.050000	USA. NIOSH Recommended
	mg/m3	Exposure Limits
TWA	0.050000	USA. NIOSH Recommended
	mg/m3	Exposure Limits
TWA	0.020000	USA. ACGIH Threshold Limit Values
	mg/m3	(TLV)
Pulmonar	y function	
Asthma	•	
Myocardia	al effects	
		s a Biological Exposure Index or Indices
	section)	
		n with unknown relevance to humans
varies	3	
TWA	0.05 mg/m3	USA. NIOSH Recommended
		Exposure Limits
TWA	0.05 mg/m3	USA. NIOSH Recommended
		Exposure Limits
TWA	0.1 mg/m3	USA. Occupational Exposure Limits
		(OSHA) - Table Z-1 Limits for Air Contaminants
TWA	0.02 mg/m3	USA. ACGIH Threshold Limit Values
		(TLV)
	y function	
Asthma		
Myocardia		
		s a Biological Exposure Index or Indices
(see BEI	③ section)	
Confirme	d animal carcinoger	n with unknown relevance to humans
PEL	0.02 mg/m3	California permissible exposure
FEL	0.02 1119/1113	limits for chemical contaminants
		(Title 8, Article 107)
		(Tide 0, Alticle 101)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Cobalt	7440-48-4	Cobalt	15.0000 μg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift a	t end of work	week	
		Cobalt	1.0000 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift a	t end of work	week	
		Cobalt	15 μg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift a	t end of worl	week	,
		Cobalt		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift a	t end of work	week	

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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, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. 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

temperature

Decomposition temperature

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	No data available
f)	Initial boiling point and boiling range	2,900 °C (5,252 °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	8.9 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	No data available

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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 oxidizing agents, Acetylene, Material readily reacts with acids generating flammable and/or explosive hydrogen gas., Mineral acids, Hydrazinium nitrate

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Cobalt/cobalt 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

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Cobalt)

2A - Group 2A: Probably carcinogenic to humans (Cobalt)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Cobalt)

2A - Group 2A: Probably carcinogenic to humans (Cobalt)

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

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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

Kidney injury may occur., Damage to the eyes., Lung irritation, chest pain, pulmonary edema, May cause irritation of the:, nose, Throat., sensation of heat

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

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.

Poison Inhalation Hazard: No

IMDG

UN number: 3089 Class: 4.1 Packing group: II EMS-No: F-G, S-G

Proper shipping name: METAL POWDER, FLAMMABLE, N.O.S.

IATA

UN number: 3089 Class: 4.1 Packing group: II

Proper shipping name: Metal powder, flammable, n.o.s.

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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 7440-48-4 2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

CAS-No. Revision Date 7440-48-4 2007-07-01

Pennsylvania Right To Know Components

CAS-No. Revision Date Cobalt 7440-48-4 2007-07-01

Graphene-like carbon -

New Jersey Right To Know Components

CAS-No. Revision Date 7440-48-4 2007-07-01

Graphene-like carbon -

California Prop. 65 Components

WARNING! This product contains a chemical known to the CAS-No. Revision Date State of California to cause cancer. 7440-48-4 2007-09-28

Cobalt

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aguatic Chronic Chronic aguatic toxicity

Eye Irrit. Eye irritation

H317 May cause an allergic skin reaction. H319 Causes serious eye irritation.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H335 May cause respiratory irritation.

H400 Very toxic to aquatic life.

Very toxic to aquatic life with long lasting effects.
 May cause long lasting harmful effects to aquatic life.

Resp. Sens. Respiratory sensitisation

Skin Sens. Skin sensitisation

HMIS Rating

Health hazard: 2
Chronic Health Hazard: *
Flammability: 3
Physical Hazard 3

NFPA Rating

Health hazard: 2
Fire Hazard: 3
Reactivity Hazard: 3

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Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 3.11 Revision Date: 05/23/2016 Print Date: 07/17/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 03/12/2019 Print Date 06/22/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

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 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 # : +1-703-527-3887

SECTION 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

SECTION 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

| Component | Classification | Concentration |

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Copper,	
	<= 100 %

SECTION 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

SECTION 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

Copper oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 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.

Millipore SigMa

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6.4 Reference to other sections

For disposal see section 13.

SECTION 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.

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

SECTION 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 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Irritation Gastrointestinal metal fume fever		
		TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointes metal fume		

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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.

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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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: Wire

Colour: light red

b) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/range: 1,083.4 °C (1,982.1 °F)

point/freezing point

Initial boiling point 2,567 °C 4,653 °F

and boiling range

g) Flash point ()No data available

h) Evaporation rate No data available

i) Flammability (solid, No data available

gas)

j) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure No data available

I) Vapour density No data available

m) Relative density 8.940 g/cm³

n) Water solubility No data available

o) Partition coefficient: No data available

n-octanol/water

p) Auto-ignition No data available temperature

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



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SECTION 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

SECTION 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

on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available No data available

Specific target organ toxicity - single exposure

No data available

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Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: GL5325000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

No data available

12.2 Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

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

SECTION 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.

SECTION 14: Transport information

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

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SECTION 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

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16
Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16
New Jersey Right To Know Components Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

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.

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1 Revision Date: 03/12/2019 Print Date: 06/22/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 05/14/2019 Print Date 07/17/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Cyanide, Total

Product Number : QC1496

Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

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 # : +1-703-527-3887

SECTION 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

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Sigma-Aldrich - QC1496

No components need to be disclosed according to the applicable regulations.



Page 1 of 7

SECTION 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

SECTION 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

Nature of decomposition products not known.

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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

Keep in suitable, closed containers for disposal.

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

Keep container tightly closed in a dry and well-ventilated place.

Store at Room Temperature.

Storage class (TRGS 510): 12: Non Combustible Liquids

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

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

General industrial hygiene practice.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

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

Respiratory protection not required. For nuisance exposures use type OV/AG (US) or type ABEK (EU EN 14387) respirator cartridges. 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: liquid

b) Odour No data available

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c)	Odour Threshold	No data available
d)	рН	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
I)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
0)	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

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

Millipore SigMa

Sigma-Aldrich - QC1496 Page 4 of 7

10.6 Hazardous decomposition products

Other decomposition products - No data available

Hazardous decomposition products formed under fire conditions. - Nature of decomposition products not known.

In the event of fire: see section 5

SECTION 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

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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

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.

Millipore SigMa

SECTION 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

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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

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13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 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

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Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Water	CAS-No. 7732-18-5	Revision Date
Tripotassium hexacyanoferrate	13746-66-2	2015-07-08
Potassium hydroxide	1310-58-3	1989-08-11

New Jersey Right To Know Components

Water	•	CAS-No.	Revision Date
		7732-18-5	

California Prop. 65 Components

WARNING: This product contains a chemical known to	CAS-No.	Revision Date
the State of California to cause birth defects or other	13746-66-2	2016-10-21
reproductive harm. Tripotassium hexacyanoferrate		

SECTION 16: Other information

Further information

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Version: 6.0 Revision Date: 05/14/2019 Print Date: 07/17/2019





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SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 20.10.2018
Date Updated: 07.05.2009
Version 1.4

Section 1 - Product and Company Information

Product Name 1,2:5,6-DIBENZANTHRACENE, 97% (NO BULK

ORDERS ALLOWED)

Product Number D31400 Brand ALDRICH

Company Sigma-Aldrich
Address 3050 Spruce Street

SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832 Fax: 800-325-5052 Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name CAS # SARA 313 1,2:5,6-DIBENZANTHRACENE 53-70-3 Yes

Formula C22H14

Synonyms 1,2:5,6-Benzanthracene * DB(a,h)A * 1,2,5,6-Dba *

1,2,5,6-Dibenzanthraceen (Dutch) *

1,2:5,6-Dibenzanthracene *
1,2:5,6-Dibenz(a)anthracene *
Dibenzo(a,h)anthracene *

1,2:5,6-Dibenzoanthracene * RCRA waste number U063

RTECS Number: HN2625000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic. Dangerous for the environment.

May cause cancer. Very toxic to aquatic organisms, may cause

long-term adverse effects in the aquatic environment.

Target organ(s): Lungs. Liver. Calif. Prop. 65 carcinogen.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 2

FLAMMABILITY: 0 REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

METHODS FOR CLEANING UP

Evacuate area.

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

-

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). 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.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country Source Type Value
Poland NDS 0.004 MG/M3
Poland NDSCh Poland NDSP -

Section 9 - Physical/Chemical Properties

Appearance Physical State: Solid

Property Value At Temperature or Pressure

Molecular Weight 278,3500 AMU

pH N/A

BP/BP Range 524,000 °C 760,000 mmHg

MP/MP Range 262,000 °C Freezing Point N/A Vapor Pressure N/A Vapor Density N/A Saturated Vapor Conc. N/A Bulk Density N/A Odor Threshold N/A

Volatile% N/A VOC Content N/AWater Content N/A Solvent Content N/A N/A Evaporation Rate Viscosity N/ASurface Tension N/APartition Coefficient N/A Decomposition Temp. N/A Flash Point N/A

Explosion Limits N/A Flammability N/A Autoignition Temp N/A Refractive Index N/A Optical Rotation N/A Miscellaneous Data N/A

Solubility N/A

N/A = not available

Section 10 - Stability and Reactivity

Stable: Stable.

STABILITY

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: May cause eye irritation.

Inhalation: Material may be irritating to mucous membranes and

upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Lungs. Liver.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CHRONIC EXPOSURE - CARCINOGEN

Result: 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.

Species: Rat

Route of Application: Intratracheal

Dose: 100 MG/KG

Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs,

Thorax, or Respiration: Tumors.

Species: Mouse

Route of Application: Oral

Dose: 4160 MG/KG Exposure Time: 26W

Frequency: I

Result: Lungs, Thorax, or Respiration:Tumors. Tumorigenic:Carcinogenic by RTECS criteria.

Species: Mouse

Route of Application: Skin

Dose: 1200 MG/KG Exposure Time: 50W

Frequency: I

Result: Tumorigenic: Tumors at site or application.

Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages:

Other: Tumors.

Species: Mouse

Route of Application: Subcutaneous

Dose: 445 UG/KG

Result: Skin and Appendages: Other: Tumors.

Tumorigenic: Carcinogenic by RTECS criteria. Tumorigenic: Tumors

at site or application.

Species: Mouse

Route of Application: Intravenous

Dose: 40 MG/KG

Result: Tumorigenic: Neoplastic by RTECS criteria. Lungs, Thorax,

or Respiration: Tumors. Liver: Tumors.

Species: Mouse

Route of Application: Implant

Dose: 80 MG/KG

Result: Kidney, Ureter, Bladder: Tumors. Tumorigenic: Carcinogenic

by RTECS criteria.

Species: Mouse

Route of Application: Multiple

Dose: 40 MG/KG Exposure Time: 12D

Frequency: I

Result: Tumorigenic: Tumors at site or application. Lungs,

Thorax, or Respiration: Tumors. Tumorigenic: Equivocal tumorigenic

agent by RTECS criteria.

Species: Guinea pig

Route of Application: Subcutaneous

Dose: 250 MG/KG Exposure Time: 24D

Frequency: I

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Tumorigenic: Tumors at site or application. Lungs,

Thorax, or Respiration: Tumors.

Species: Guinea pig

Route of Application: Intravenous

Dose: 30 MG/KG

Result: Tumorigenic: Tumors at site or application. Lungs,

Thorax, or Respiration: Tumors. Tumorigenic: Equivocal tumorigenic

agent by RTECS criteria.

Species: Pigeon

Route of Application: Intramuscular

Dose: 6 MG/KG

Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors. Tumorigenic:Tumors at site or application.

Species: Frog

Route of Application: Intrarenal

Dose: 12 MG/KG

Result: Kidney, Ureter, Bladder:Kidney tumors. Lungs, Thorax, or Respiration:Tumors. Tumorigenic:Neoplastic by RTECS criteria.

Species: Mouse

Route of Application: Implant

Dose: 14 MG/KG

Result: Tumorigenic: Neoplastic by RTECS criteria. Tumorigenic: Tumors at site or application.

Species: Mouse

Route of Application: Subcutaneous

Dose: 78 UG/KG

Result: Tumorigenic: Neoplastic by RTECS criteria.

Tumorigenic: Tumors at site or application.

Species: Mouse

Route of Application: Oral

Dose: 4520 MG/KG Exposure Time: 36W

Frequency: C

Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Gastrointestinal:Tumors.

Species: Mouse

Route of Application: Implant

Dose: 200 MG/KG

Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma. Tumorigenic:Tumors at

site or application.

Species: Mouse

Route of Application: Skin

Dose: 6 UG/KG

Result: Tumorigenic: Neoplastic by RTECS criteria. Skin and

Appendages: Other: Tumors.

Species: Mouse

Route of Application: Subcutaneous

Dose: 6 MG/KG

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Tumorigenic: Tumors at site or application.

Species: Mouse

Route of Application: Skin

Dose: 400 MG/KG Exposure Time: 40W

Frequency: I

Result: Tumorigenic: Neoplastic by RTECS criteria. Skin and

Appendages: Other: Tumors.

Species: Mouse

Route of Application: Implant

Dose: 100 MG/KG

Result: Tumorigenic: Carcinogenic by RTECS criteria. Kidney,

Ureter, Bladder:Tumors. Tumorigenic:Tumors at site or

application.

Species: Rat

Route of Application: Subcutaneous

Dose: 135 MG/KG Exposure Time: 9W Frequency: I

Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Tumorigenic:Tumors at site or application.

Species: Mouse

Route of Application: Subcutaneous

Dose: 400 MG/KG Exposure Time: 10W

Frequency: I

Result: Tumorigenic: Neoplastic by RTECS criteria.

Tumorigenic: Tumors at site or application.

IARC CARCINOGEN LIST

Rating: Group 2A

NTP CARCINOGEN LIST

Rating: Anticipated to be a carcinogen.

CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Species: Human
Dose: 360 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Human Dose: 100 UMOL/L Cell Type: fibroblast

Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 10 MG/L

Cell Type: Other cell types

Mutation test: Unscheduled DNA synthesis

Species: Human Dose: 100 NMOL/L Cell Type: HeLa cell

Mutation test: Unscheduled DNA synthesis

Species: Human Dose: 54 UG/L

Cell Type: lymphocyte

Mutation test: Mutation in mammalian somatic cells.

Species: Rat

Route: Intratracheal Dose: 25500 UG/KG Exposure Time: 16H

Mutation test: Micronucleus test

Species: Rat
Route: Oral
Dose: 200 MG/KG

 ${\tt Mutation\ test:\ Morphological\ transformation.}$

Species: Rat
Dose: 100 UG/L
Cell Type: Embryo

Mutation test: Morphological transformation.

Species: Rat

Route: Intratracheal Dose: 25560 UG/KG Mutation test: DNA

Species: Rat

Route: Intratracheal Dose: 51150 UG/KG

Mutation test: Sister chromatid exchange

Species: Mouse

Route: Intraperitoneal

Dose: 500 MG/KG

Mutation test: Micronucleus test

Species: Mouse

Dose: 4250 UG/L (+S9) Cell Type: lymphocyte

Mutation test: Mutation in microorganisms

Species: Mouse Dose: 500 UG/L

Cell Type: fibroblast

Mutation test: Morphological transformation.

Species: Mouse Dose: 100 UG/L Cell Type: Embryo

Mutation test: Morphological transformation.

Species: Mouse
Dose: 6 UMOL/L
Cell Type: liver
Mutation test: DNA

Species: Mouse Route: Skin Dose: 40 UMOL/KG Mutation test: DNA

Species: Mouse
Dose: 1 MG/L

Cell Type: Other cell types

Mutation test: DNA

Species: Mouse Dose: 1 MG/L

Cell Type: Other cell types

Mutation test: Other mutation test systems

Species: Mouse
Dose: 510 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Mouse
Dose: 510 NMOL/L
Cell Type: Embryo

Mutation test: Other mutation test systems

Species: Hamster

Dose: 56400 NMOL/L (+S9)

Cell Type: lung

Mutation test: Mutation in microorganisms

Species: Hamster Dose: 2500 UG/L Cell Type: Embryo

Mutation test: Morphological transformation.

Species: Hamster Dose: 25 UG/L Cell Type: kidney

Mutation test: Morphological transformation.

Species: Hamster Dose: 5 MG/L Exposure Time: 24H Cell Type: fibroblast

Mutation test: DNA damage

Species: Hamster Dose: 360 NMOL/L Cell Type: Embryo Mutation test: DNA

Species: Hamster Dose: 5 MG/L Cell Type: kidney

Mutation test: DNA damage

Species: Hamster Dose: 1 MG/L Cell Type: lung Mutation test: DNA

Species: Hamster Dose: 1 MG/L Cell Type: lung

Mutation test: Other mutation test systems

Species: Hamster Dose: 1 MMOL/L

Cell Type: fibroblast

Mutation test: Cytogenetic analysis

Species: Hamster

Route: Intraperitoneal

Dose: 900 MG/KG Exposure Time: 24H

Mutation test: Sister chromatid exchange

Species: Hamster Dose: 500 UG/L Cell Type: lung

Mutation test: Mutation in mammalian somatic cells.

Species: Mammal
Dose: 2 NMOL/L

Cell Type: lymphocyte Mutation test: DNA damage

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose
of this material. Observe all federal, state, and local
environmental regulations. (DN)Requires special label: "Contains a
substance which is regulated by Dannish work environmental law due
to the risk of carcinogenic properties."

Section 14 - Transport Information

DOT

Proper Shipping Name: Environmentally hazardous

substances, solid, n.o.s.

UN#: 3077 Class: 9

Packing Group: Packing Group III

Hazard Label: Class 9

PIH: Not PIH

IATA

Proper Shipping Name: Environmentally hazardous

substance, solid, n.o.s
IATA UN Number: 3077
Hazard Class: 9
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: T-N

Indication of Danger: Toxic. Dangerous for the environment.

R: 45-50/53

Risk Statements: May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S: 53-45-60-61

Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Toxic. Dangerous for the environment. Risk Statements: May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Wear suitable protective clothing, gloves, and eye/face protection. This

material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

US Statements: Target organ(s): Lungs. Liver. Calif. Prop. 65 carcinogen.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

NOTES: This product is subject to SARA section 313 reporting

requirements.

TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65

California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer. This product is or contains chemical(s) known to the state of California to cause cancer.

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No NDSL: Yes

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

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 Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2010 Sigma-Aldrich Co. License granted to make unlimitedpaper copies for internal use only.



SAFETY DATA SHEET

Version 6.0 Revision Date 04/15/2019 Print Date 06/28/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Dibenzofuran

Product Number : 236373 Brand : Aldrich CAS-No. : 132-64-9

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 # : +1-703-527-3887

SECTION 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

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : Diphenylene oxide

Formula : $C_{12}H_8O$ Molecular weight : 168.19 g/mol CAS-No. : 132-64-9

Aldrich - 236373 Page 1 of 8



EC-No. : 205-071-3

No components need to be disclosed according to the applicable regulations.

SECTION 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

SECTION 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

SECTION 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.

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SECTION 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. 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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls

General industrial hygiene practice.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail

sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This

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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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: powder, finecrystalline

Colour: white, beige

b) Odourc) Odour Thresholddata available

d) pH No data available

e) Melting point/freezing point

Melting point/range: 80 - 82 °C (176 - 180 °F) - lit.

f) Initial boiling point and boiling range

154 - $155\ ^{\circ}\text{C}\ 309$ - $311\ ^{\circ}\text{F}\ at\ 27\ hPa$ - lit.

g) Flash point 130 °C (266 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, No data available

gas)

No data available

j) Upper/lower flammability or explosive limits

k) Vapour pressure No data availablel) Vapour density No data available

m) Relative density 1.3 g/cm3 at 20 °C (68 °F)

n) Water solubility insoluble

o) Partition coefficient: log Pow: 4.12 - (Lit.), Potential bioaccumulation n-octanol/water

p) Auto-ignition No data available temperature

q) Decomposition No data available

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temperature

r) Viscosity No data availables) Explosive properties No data availablet) 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

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

SECTION 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.

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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

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.

Hazardous properties cannot be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 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 ecological problems are to be expected when the product is handled and used with due care and attention.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

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Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Dibenzofuran)

Reportable Quantity (RQ): 100 lbs

Marine pollutant: yesPoison 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.

(Dibenzofuran)

Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Dibenzofuran)

SECTION 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:

Dibenzofuran CAS-No. Revision Date 2007-07-01

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

Dibenzofuran CAS-No. Revision Date 2007-07-01

Pennsylvania Right To Know Components

Dibenzofuran CAS-No. Revision Date 132-64-9 2007-07-01

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.

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SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.0 Revision Date: 04/15/2019 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 03/13/2019 Print Date 06/29/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Diethyl phthalate

Product Number : W512206 Brand : Aldrich CAS-No. : 84-66-2

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 # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Short-term (acute) aquatic hazard (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 none
Signal word none

Hazard statement(s)

H402 Harmful to aquatic life.

Precautionary statement(s)

P273 Avoid release to the environment.

P501 Dispose of contents/ container to an approved waste disposal

plant.

Aldrich - W512206 Page 1 of 9



2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : DEP

Formula : $C_{12}H_{14}O_4$ Molecular weight : 222.24 g/mol CAS-No. : 84-66-2 EC-No. : 201-550-6

Component	Classification Concentrati		
Diethyl phthalate			
	Aquatic Acute 3; H402	<= 100 %	

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 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

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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

Keep in suitable, closed containers for disposal.

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

Keep container tightly closed in a dry and well-ventilated place. Storage class (TRGS 510): 10: Combustible liquids

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

Components with workplace control parameters

Component	CAS-No.	Value	Control	Basis
			parameters	
Diethyl phthalate	84-66-2	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Not classifiable as a human carcinogen		

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TWA	9	USA. NIOSH Recommended Exposure Limits
PEL		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

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

Respiratory protection not required. For nuisance exposures use type OV/AG (US) or type ABEK (EU EN 14387) respirator cartridges. 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.

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SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance Form: liquid

Colour: light yellow

b) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/range: 3 °C (37 °F) - lit.

point/freezing point
Initial boiling point

f) Initial boiling point 298 - 299 °C 568 - 570 °F - lit. and boiling range

g) Flash point 156.0 °C (312.8 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, No data available gas)

j) Upper/lower Lower explosion limit: 0.75 %(V)

flammability or explosive limits

k) Vapour pressure < 28 hPa at 25 °C (77 °F)

I) Vapour density 7.7 - (Air = 1.0)

m) Relative density 1.12 g/mL at 25 °C (77 °F)

n) Water solubility 0.932 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - slightly

soluble

o) Partition coefficient: log Pow: 2.2 at 41 °C (106 °F)

n-octanol/water

p) Auto-ignition 457.0 °C (854.6 °F)

temperature

q) Decomposition No data available temperature

r) Viscosity 11.53 mm2/s at 20 °C (68 °F) -

s) Explosive properties No data availablet) Oxidizing properties No data available

9.2 Other safety information

Relative vapour 7.7 - (Air = 1.0) density

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

Aldrich - W512206 Page 5 of 9

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. - Carbon oxides Other decomposition products - No data available In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 5,591 mg/kg (OECD Test Guideline 401) LC50 Inhalation - Rat - 6 h - >= 4.64 mg/l LD50 Dermal - Rat - male and female - > 11,181 mg/kg No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit

Result: No eye irritation - 48 h

Respiratory or skin sensitisation

Buehler Test - Guinea pig

Result: Did not cause sensitisation on laboratory animals.

(OECD Test Guideline 406)

Germ cell mutagenicity

No data available
In vitro mammalian cell

In vitro mammalian cell gene mutation test

mouse lymphoma cells

Result: negative

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

on OSHA's list of regulated carcinogens.

Reproductive toxicity

No data available

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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

Repeated dose toxicity - Rat - male and female - Oral - No observed adverse effect level - 150 mg/kg

RTECS: TI1050000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish flow-through test LC50 - Cyprinodon variegatus (sheepshead

minnow) - 29 mg/l - 96 h

(US-EPA)

Toxicity to daphnia

and other aquatic invertebrates

static test LC50 - Daphnia magna (Water flea) - 90 mg/l - 48 h

Toxicity to algae static test EC50 - Desmodesmus subspicatus (green algae) - 23 mg/l

- 72 h

(OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d

Result: 94.6 % - Readily biodegradable.

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.

Harmful to aquatic life.

No data available



SECTION 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.

SECTION 14: Transport information

DOT (US)

UN number: 3082 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Diethyl

ohthalate)

Reportable Quantity (RQ): 1000 lbs Poison Inhalation Hazard: No

IMDG

Not dangerous goods

IATA

Not dangerous goods

SECTION 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

independent in gire to inner compension		
	CAS-No.	Revision Date
Diethyl phthalate	84-66-2	1993-02-16

Pennsylvania Right To Know Components

Diethyl phthalate	CAS-No.	Revision Date
	84-66-2	1993-02-16

Diethyl phthalate	CAS-No.	Revision Date
	84-66-2	1993-02-16

New Jersey Right To Know Components

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Diethyl phthalate CAS-No. Revision Date 84-66-2 1993-02-16

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.

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.0 Revision Date: 03/13/2019 Print Date: 06/29/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 01/31/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Dibutyl phthalate

Product Number : 524980
Brand : Aldrich
Index-No. : 607-318-00-4

CAS-No. : 84-74-2

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 # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Reproductive toxicity (Category 1B), H360 Acute aquatic toxicity (Category 1), H400

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)

H360 May damage fertility or the unborn child.

H400 Very toxic 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.

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 : <I>n</>-Butyl phthalate

Phthalic acid dibutyl ester

DBP

Formula : C<SB>16</>H<SB>22</>O<SB>4</>

Molecular weight : 278.34 g/mol CAS-No. : 84-74-2 EC-No. : 201-557-4 Index-No. : 607-318-00-4

Hazardous components

Component Classification		Concentration	
Dibutyl phthalate Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)			
	Repr. 1B; Aquatic Acute 1; H360, H400	<= 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 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 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

Components with v	. C. IIpiaco Con	u o paramore	. •	
Component	CAS-No.	Value	Control	Basis
			parameters	
Dibutyl phthalate	84-74-2	TWA	5.000000	USA. ACGIH Threshold Limit Values
			mg/m3	(TLV)
	Remarks	Upper Resp	iratory Tract irritation	on
		Eye irritation	1	
		Testicular da	amage	
		TWA	5 mg/m3	USA. ACGIH Threshold Limit Values
				(TLV)
		Upper Resp	iratory Tract irritation	on
		Eye irritation	1	
		Testicular da	amage	
		TWA	5.000000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
		TWA	5.000000	USA. NIOSH Recommended
			mg/m3	Exposure Limits

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: Nature latex/chloroprene Minimum layer thickness: 0.6 mm Break through time: 480 min

Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 77 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 industria 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 (US) or type ABEK (EN 14387) respirator cartridges as a backup to enginee 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) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing

point

Melting point/range: -35 °C (-31 °F) - lit.

f) Initial boiling point and

boiling range

340 °C (644 °F) - lit.

g) Flash point 171.0 °C (339.8 °F) - closed cup

h) Evaporation rate No data available

i) Flammability (solid, gas) No data available

j) Upper/lower Lower explosion limit: 0.47 %(V)

flammability or

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explosive limits

k) Vapour pressure 1.3 hPa at 147.0 °C (296.6 °F)

Vapour density
 No data available

m) Relative density 1.043 g/cm3 at 25 °C (77 °F)

n) Water solubility 0.0114 g/l at 25 °C (77 °F) - OECD Test Guideline 105 - slightly soluble

o) Partition coefficient: n-

octanol/water

No data available

p) Auto-ignition 402.0 °C (755.6 °F)

temperature

q) Decomposition temperature

No data available

r) Viscosity 18.8 mm2/s at 20 °C (68 °F) -

s) Explosive properties No data availablet) 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, Nitrates, Bases, acids, Chlorine

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 - 8,000 mg/kg(Dibutyl phthalate)

LC50 Inhalation - Rat - 4,250 mg/m3(Dibutyl phthalate)

LD50 Dermal - Rabbit - > 20,860 mg/kg(Dibutyl phthalate)

No data available(Dibutyl phthalate)

Skin corrosion/irritation

Skin - Rabbit(Dibutyl phthalate)

Result: No skin irritation (OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit(Dibutyl phthalate)

Result: No eye irritation

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(OECD Test Guideline 405)

Respiratory or skin sensitisation

Maximisation Test - Guinea pig(Dibutyl phthalate)

Result: Does not cause skin sensitisation.

(OECD Test Guideline 406)

Germ cell mutagenicity

No data available(Dibutyl phthalate)

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

Presumed human reproductive toxicant(Dibutyl phthalate)

Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.(Dibutyl phthalate)

Specific target organ toxicity - single exposure

No data available(Dibutyl phthalate)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Dibutyl phthalate)

Additional Information

RTECS: TI0875000

Nausea, Dizziness, Headache, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Dibutyl phthalate)

Central nervous system - (Dibutyl phthalate)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 0.85 mg/l - 96.0 h(Dibutyl

phthalate)

NOEC - Pimephales promelas (fathead minnow) - 0.32 mg/l - 96.0 h(Dibutyl

phthalate)

Toxicity to daphnia and

other aquatic invertebrates

LC50 - Daphnia magna (Water flea) - 3.7 mg/l - 48 h(Dibutyl phthalate)

12.2 Persistence and degradability

Biodegradability Result: 81 % - Readily biodegradable.

(Regulation (EC) No. 440/2008, Annex, C.4-C)

12.3 Bioaccumulative potential

Bioaccumulation Pimephales promelas (fathead minnow) - 11 d

- 0.0348 mg/l(Dibutyl phthalate)

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Bioconcentration factor (BCF): 2,165 Remarks: Does not bioaccumulate.

12.4 Mobility in soil

No data available(Dibutyl phthalate)

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.

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.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3082 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Dibutyl phthalate)

Reportable Quantity (RQ) : 10 lbs

Marine pollutant: no no Poison Inhalation Hazard: No

IMDG

UN number: 3082 Class: 9 Packing group: III EMS-No: F-A, S-F

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Dibutyl phthalate)

Marine pollutant : yes

IATA

UN number: 3082 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Dibutyl phthalate)

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.

CAS-No.

Revision Date

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:

Dibutyl phthalate 84-74-2 2007-07-01

SARA 311/312 Hazards

Chronic Health Hazard

Massachusetts Right To Know Components

CAS-No. Revision Date

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Dibutyl phthalate	84-74-2	2007-07-01
Pennsylvania Right To Know Components		
Dibutyl phthalate	CAS-No. 84-74-2	Revision Date 2007-07-01
New Jersey Right To Know Components		
	CAS-No.	Revision Date
Dibutyl phthalate	84-74-2	2007-07-01
California Prop. 65 Components		
WARNING: This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause birth defects or other reproductive	84-74-2	2008-06-17
harm.		
Dibutyl phthalate		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H360 May damage fertility or the unborn child.

H400 Very toxic to aquatic life.

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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.0 Revision Date: 01/31/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 5.9 Revision Date 05/07/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 **Product identifiers**

> Product name Fluoranthene

Product Number 423947 Brand Aldrich

CAS-No. 206-44-0

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

> Sigma-Aldrich Company

> > 3050 Spruce Street SAINT LOUIS MO 63103

USA

+1 800-325-5832 Telephone 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 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)

H302 Harmful if swallowed.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth. P330 Collect spillage. P391

P501 Dispose of contents/ container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS - none 2.3

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Benzo[j,k]fluorene

Formula : C₁₆H₁₀

Molecular weight : 202.25 g/mol

CAS-No. : 206-44-0

EC-No. : 205-912-4

Hazardous components

Component	Classification	Concentration
Fluoranthene		
	Acute Tox. 4; Aquatic Acute 1 Aquatic Chronic 1; H302, 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

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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. 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): 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

Component	CAS-No.	Value	Control	Basis
			parameters	
Fluoranthene	206-44-0	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- Hydroxypyren e	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at	end of work	week	
		3- hydroxybenz o(a)pyrene		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.

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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

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

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. 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) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing Melting point/range: 105 - 110 °C (221 - 230 °F) - lit.

point

f) Initial boiling point and 384 °C (723 °F) - lit.

boiling range

g) Flash point 198.0 °C (388.4 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, gas) No data availablej) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure No data available

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I) Vapour density No data available
 m) Relative density No data available
 n) Water solubility No data available
 o) Partition coefficient: nootanol/water

p) Auto-ignition No data available temperature

q) Decomposition No data available temperaturer) Viscosity 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

LD50 Oral - Rat - 2,000 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 3,180 mg/kg

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.

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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

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

d

No data available

Aspiration hazard

No data available

Additional Information

RTECS: LL4025000

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 - Oncorhynchus mykiss (rainbow trout) - 0.0077 mg/l - 96 h

NOEC - Cyprinodon variegatus (sheepshead minnow) - 560 mg/l - 96 h

Toxicity to daphnia and

other aquatic invertebrates

Immobilization EC50 - Daphnia magna (Water flea) - > 0.005 - < 0.01 mg/l - 3

Immobilization EC50 - Daphnia magna (Water flea) - 0.78 mg/l - 20 h

NOEC - Daphnia magna (Water flea) - 0.085 mg/l - 48 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 with long lasting effects.

No data available

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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. (Fluoranthene)

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. (Fluoranthene)

Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (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.

OAO NI-

Davidatas Data

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
Fluoranthene	206-44-0	2015-11-23
Pennsylvania Right To Know Components		
, c	CAS-No.	Revision Date
Fluoranthene	206-44-0	2015-11-23
	CAS-No.	Revision Date
Fluoranthene	206-44-0	2015-11-23
New Jersey Right To Know Components		
	CAS-No.	Revision Date
Fluoranthene	206-44-0	2015-11-23

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.

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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
H302 Harmful if swallowed.
Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard: 1
Chronic Health Hazard: *
Flammability: 1
Physical Hazard 0

NFPA Rating

Health hazard: 1
Fire Hazard: 1
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.9 Revision Date: 05/07/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 03/25/2019 Print Date 06/22/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Fluorene

Product Number : 128333 Brand : Aldrich CAS-No. : 86-73-7

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 # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Short-term (acute) aquatic hazard (Category 1), H400 Long-term (chronic) aquatic hazard (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.

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plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Component	Classification	Concentration
Fluorene		
	Aquatic Acute 1; Aquatic Chronic 1; H400, H410 M-Factor - Aquatic Acute: 1	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 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

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SECTION 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

SECTION 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.

SECTION 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.

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

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Hazardous components without workplace control parameters

Biological occupational exposure limits

Diviogical occu	partional oxip				
Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Fluorene	86-73-7	1- Hydroxypyr ene	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift a	at end of w	rorkweek	
		3- hydroxyben zo(a)pyrene		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

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

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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.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

a)	Appearance	Form:	crystalline
α,	7 ippodranico	1 011111	or you annie

Colour: white

b) Odour No data available C) Odour Threshold No data available

No data available На d)

Melting point/range: 111 - 114 °C (232 - 237 °F) - lit. e) Melting point/freezing point

Initial boiling point f) and boiling range

explosive limits

298 °C 568 °F - lit.

Flash point 151.0 °C (303.8 °F) - closed cup q)

h) Evaporation rate No data available Flammability (solid, No data available i)

gas)

Upper/lower No data available j) flammability or

k) Vapour pressure No data available No data available 1) Vapour density m) Relative density No data available n) Water solubility No data available o) Partition coefficient:

n-octanol/water

No data available

p) Auto-ignition No data available temperature

q) Decomposition No data available temperature

No data available r) Viscosity Explosive properties No data available S) Oxidizing properties No data available t)

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9.2 Other safety information

No data available

SECTION 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

SECTION 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 - > 2.0 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 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.

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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: LL5670000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish LC50 - Fish - 0.82 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates

Remarks: No data available(Fluorene)

Toxicity to algae EC50 - Algae - 3.4 mg/l - 96 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 24 h

- 0.0191 mg/l(Fluorene)

Bioconcentration factor (BCF): 512

12.4 Mobility in soil

Adsorbs on 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.

Very toxic to aquatic life with long lasting effects.

No data available

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SECTION 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.

SECTION 14: Transport information

DOT (US)

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Fluorene)

Reportable Quantity (RQ): 5000 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.

(Fluorene)

Marine pollutant: yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Fluorene)

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.

SECTION 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

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Fluorene CAS-No. Revision Date

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86-73-7	1993-04-24
CAS-No.	Revision Date
86-73-7	1993-04-24

New Jersey Right To Know Components

Fluorene CAS-No. Revision Date 86-73-7 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.

SECTION 16: Other information

Fluorene

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.1 Revision Date: 03/25/2019 Print Date: 06/22/2019





SAFETY DATA SHEET

Version 6.1 Revision Date 07/17/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Indeno[1,2,3-<I>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 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 # : +1-703-527-3887

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.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : C₂₂H₁₂

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	<= 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.

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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- Hydroxypyren e		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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance Form: solid b) Odour No data available Odour Threshold No data available No data available d) pН e) Melting point/freezing 163.6 °C (326.5 °F) point

Initial boiling point and boiling range

536.0 °C (996.8 °F)

Flash point No data available No data available h) Evaporation rate Flammability (solid, gas) No data available

Upper/lower flammability or explosive limits No data available

k) Vapour pressure No data available Vapour density No data available m) Relative density No data available n) Water solubility No data available Partition coefficient: n-

octanol/water

No data available

p) Auto-ignition temperature

No data available

Decomposition temperature

No data available

Viscosity No data available r) s) Explosive properties No data available Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

Reactivity 10.1

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 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

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12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Indeno[1,2,3-cd]pyrene)

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	CAS-No.	Revision Date
State of California to cause cancer. Indeno[1,2,3-cd]pyrene	193-39-5	2007-09-28

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16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H351 Suspected of causing cancer.

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.1 Revision Date: 07/17/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 Version 6.0 Revision Date 10.11.2016 Print Date 17.07.2019

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 # : +1-703-527-3887

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	No data available

f) Initial boiling point and boiling range

itial boiling point and No data available

g) Flash point No data available
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available

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Upper/lower No data available j) flammability or explosive limits k) Vapour pressure No data available Vapour density No data available I) m) Relative density No data available n) Water solubility No data available o) Partition coefficient: n-No data available octanol/water No data available p) Auto-ignition temperature q) Decomposition No data available temperature r) Viscosity No data available s) Explosive properties No data available No data available Oxidizing properties

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

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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

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

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SAFETY DATA SHEET

Version 4.11 Revision Date 10/12/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Lead

Product Number : 391352 Brand : Aldrich

CAS-No. : 7439-92-1

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 Carcinogenicity (Category 2), H351 Reproductive toxicity (Category 2), H361

Specific target organ toxicity - repeated exposure (Category 2), H373

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)

H302 Harmful if swallowed.

H351 Suspected of causing cancer.

H361 Suspected of damaging fertility or the unborn child.

H373 May cause 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.

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.

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 : Pb

Molecular weight : 207.20 g/mol CAS-No. : 7439-92-1 EC-No. : 231-100-4

Hazardous components

Component	Classification	Concentration
Lead		
	Acute Tox. 4; Carc. 2; STOT	90 - 100 %
	RE 1; Aquatic Acute 1; Aquatic	
	Chronic 1; H302, H351, H372,	
	H410	

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.

Keep in a dry 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	Basis
			parameters	
	Remarks	See 1910.1	025	
Lead	7439-92-1	TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values
				(TLV)
		Confirmed a	animal carcinoger	n with unknown relevance to humans
		TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values
				(TLV)
		Central Ner	vous System imp	airment
		Hematologi	c effects	
		Peripheral Nervous System impairment		
		Substances for which there is a Biological Exposure Index or Indices		
		(see BEI® section)		
		Confirmed a	animal carcinoger	n with unknown relevance to humans

TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits	
See Append	See Appendix C		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Lead	200 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Not critical	•		

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

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

b) Odour No data available

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c) Odour Threshold No data availabled) pH No data available

e) Melting point/freezing Melting point/range: 327.4 °C (621.3 °F) - lit.

point

f) Initial boiling point and $1,740 \, ^{\circ}\text{C} \, (3,164 \, ^{\circ}\text{F})$ - lit.

boiling range

g) Flash point Not applicableh) Evaporation rate No data availablei) Flammability (solid, gas) No data available

j) Upper/lower flammability or explosive limits No data available

k) Vapour pressure
 l) Vapour density
 m) Relative density
 n) Water solubility
 No data available
 No data available
 No data available

o) Partition coefficient: noctanol/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

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Lead 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

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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

Rat

Cytogenetic analysis

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Lead)

NTP: RAHC - Reasonably anticipated to be a human carcinogenThe reference note has been

added by TD based on the background information of the NTP. (Lead)

OSHA: OSHA specifically regulated carcinogen (Lead)

Reproductive toxicity

Reproductive toxicity - Rat - Inhalation

Effects on Newborn: Biochemical and metabolic.

Reproductive toxicity - Rat - Oral Effects on Newborn: Behavioral.

Reproductive toxicity - Mouse - Oral

Effects on Fertility: Female fertility index (e.g., # females pregnant per females mated). Effects on Fertility: Pre-implantation mortality (e.g., reduction in numbe corpora lutea).

May damage fertility. May damage the unborn child.

Developmental Toxicity - Rat - Inhalation

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Developmental Toxicity - Rat - Oral

Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Developmental Toxicity - Rat - Oral

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Mouse - Oral

Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

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: OF7525000

anemia

Stomach - Irregularities - Based on Human Evidence

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12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish mortality LOEC - Oncorhynchus mykiss (rainbow trout) - 1.19 mg/l - 96.0 h

LC50 - Micropterus dolomieui - 2.2 mg/l - 96.0 h

mortality NOEC - Salvelinus fontinalis - 1.7 mg/l - 10.0 d

Toxicity to daphnia and

mortality LOEC - Daphnia (water flea) - 0.17 mg/l - 24 h

other aquatic invertebrates

mortality NOEC - Daphnia (water flea) - 0.099 mg/l - 24 h

Toxicity to algae mortality EC50 - Skeletonema costatum - 7.94 mg/l - 10 d

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Bioaccumulation Oncorhynchus kisutch - 2 Weeks

- 150 µg/l

Bioconcentration factor (BCF): 12

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 substance, solid, n.o.s. (Lead)

Reportable Quantity (RQ): 10 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. (Lead)

Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)

Further information

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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** Lead 7439-92-1 2015-11-23

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

D. Revision Date
2-1 2015-11-23
o. Revision Date
2-1 2015-11-23
o. Revision Date
2-1 2015-11-23

New Jersey Right To Know Components

CAS-No. **Revision Date** 7439-92-1 2015-11-23 Lead

California Prop. 65 Components

WARNING! This product contains a chemical known to the CAS-No. **Revision Date** State of California to cause cancer. 7439-92-1 2009-02-01

Lead

WARNING: This product contains a chemical known to the CAS-No. **Revision Date** State of California to cause birth defects or other reproductive 7439-92-1 2009-02-01 harm.

Lead

H351

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 H302 Harmful if swallowed.

Suspected of causing cancer. Suspected of damaging fertility or the unborn child. H361

Causes damage to organs through prolonged or repeated exposure. H372 May cause damage to organs through prolonged or repeated exposure. H373

Further information

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Preparation Information Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.11 Revision Date: 10/12/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 01/31/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Magnesium

Product Number : 200905
Brand : Sigma-Aldrich
Index-No. : 012-002-00-9

CAS-No. : 7439-95-4

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 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 # : +1-703-527-3887

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

Self-heating substances and mixtures (Category 1), H251

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)

H228 Flammable solid.

H251 Self-heating: may catch fire.

H261 In contact with water releases flammable gases.

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking. P223 Keep away from any possible contact with water, because of violent

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reaction and possible flash fire.

P231 + P232 Handle under inert gas. Protect from moisture.

P235 + P410 Keep cool. Protect from sunlight.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.

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.

P407 Maintain air gap between stacks/ pallets.

P413 Store bulk masses greater than .? kg/ .? lbs at temperatures not

exceeding .? °C/ .? °F.

P420 Store away from other materials.

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

3.1 Substances

Formula : Mg

 Molecular weight
 : 24.31 g/mol

 CAS-No.
 : 7439-95-4

 EC-No.
 : 231-104-6

 Index-No.
 : 012-002-00-9

Hazardous components

Component	Classification	Concentration				
Magnesium (non pyrophoric)						
	Flam. Sol. 1; Self-heat. 1;	<= 100 %				
	Water-react. 2; H228, H251, H261					

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. 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

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5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder

5.2 Special hazards arising from the substance or mixture

Magnesium oxide

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. 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).

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 combu formation should be taken into consideration before additional processing

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.

Never allow product to get in contact with water during storage.

Store under inert gas. Air and moisture 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

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

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).

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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 industria 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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: Turnings
b) Odour No data available
c) Odour Threshold No data available
d) pH No data available

e) Melting point/freezing Melting point/range: 648 °C (1198 °F) - lit.

point

f) Initial boiling point and 1,090 °C (1,994 °F) - lit.

boiling range

g) Flash point ()No data availableh) Evaporation rate No data available

i) Flammability (solid, gas) May form combustible dust concentrations in air.

j) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure 1 hPa at 621 °C (1150 °F)

I) Vapour density No data available

m) Relative density 1.74 g/mL at 25 °C (77 °F)

n) Water solubility No data available

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o) Partition coefficient: n-

octanol/water

No data available

p) Auto-ignition temperature

The substance or mixture is classified as self heating with the category 1.

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

Heat, flames and sparks. Exposure to moisture

10.5 Incompatible materials

Acids, Strong oxidizing agents, Acid chlorides, Halogens

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Magnesium 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 availableMagnesium (non pyrophoric)

Inhalation: No data available(Magnesium (non pyrophoric))

Dermal: No data available(Magnesium (non pyrophoric))

No data available(Magnesium (non pyrophoric))

Skin corrosion/irritation

No data available(Magnesium (non pyrophoric))

Serious eye damage/eye irritation

No data available(Magnesium (non pyrophoric))

Respiratory or skin sensitisation

No data available(Magnesium (non pyrophoric))

Germ cell mutagenicity

No data available(Magnesium (non pyrophoric))

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.

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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(Magnesium (non pyrophoric))

No data available(Magnesium (non pyrophoric))

Specific target organ toxicity - single exposure

No data available(Magnesium (non pyrophoric))

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Magnesium (non pyrophoric))

Additional Information

RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, chills, Fever, fatigue, muscle pain, joint pain, rash, Anorexia.(Magnesium (non pyrophoric))

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Magnesium (non pyrophoric))

Liver - Irregularities - Based on Human Evidence

Liver - Irregularities - Based on Human Evidence(Magnesium (non pyrophoric))

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(Magnesium (non pyrophoric))

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

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13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber b 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: 1869 Class: 4.1 Packing group: III

Proper shipping name: Magnesium Poison Inhalation Hazard: No

IMDG

UN number: 1869 Class: 4.1 Packing group: III EMS-No: F-G, S-G

Proper shipping name: MAGNESIUM

IATA

UN number: 1869 Class: 4.1 Packing group: III

Proper shipping name: Magnesium

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, Reactivity Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

CAS-No. Revision Date Magnesium (non pyrophoric) 7439-95-4 1993-04-24

Pennsylvania Right To Know Components

Magnesium (non pyrophoric)

CAS-No. Revision Date
7439-95-4

1993-04-24

New Jersey Right To Know Components

CAS-No. Revision Date Magnesium (non pyrophoric) 7439-95-4 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.

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.

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H228 Flammable solid.

H251 Self-heating: may catch fire.

H261 In contact with water releases flammable gases.

HMIS Rating

Health hazard: 0
Chronic Health Hazard: *
Flammability: 3
Physical Hazard 2

NFPA Rating

Health hazard: 0
Fire Hazard: 0
Reactivity Hazard: 2

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.0 Revision Date: 01/31/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Manganese

Product Number : 463728 Brand : Aldrich

CAS-No. : 7439-96-5

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 # : +1-703-527-3887

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 1), H260 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)

H260 In contact with water releases flammable gases which may ignite

spontaneously.

H412 Harmful to aquatic life with long lasting effects.

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.

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P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ 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 : Mn

Molecular weight : 54.94 g/mol CAS-No. : 7439-96-5 EC-No. : 231-105-1

Hazardous components

Component	Classification	Concentration
Manganese		
	Water-react. 1; Aquatic Acute 3; Aquatic Chronic 3; H260, 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

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

Dry powder Carbon dioxide (CO2)

Unsuitable extinguishing media

Water

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5.2 Special hazards arising from the substance or mixture

Manganese/manganese 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

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wetbrushing 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

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

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.

Moisture sensitive. 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	Basis
Component	CAS-NO.	value		Dasis
			parameters	
Manganese	7439-96-5	TWA	0.200000	USA. ACGIH Threshold Limit Values
			mg/m3	(TLV)
	Remarks	Central Nervous System impairment		
		Adopted value	ues or notations er	nclosed are those for which changes
		are proposed in the NIC		
		See Notice of Intended Changes (NIC)		
		С	5.000000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
		Ceiling limit	is to be determined	d from breathing-zone air samples.
		С	5 mg/m3	USA. Occupational Exposure Limits
				(OSHA) - Table Z-1 Limits for Air
				Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		

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1	TWA	1.000000	USA. NIOSH Recommended
	1 ***	mg/m3	Exposure Limits
	ST	3.000000	USA. NIOSH Recommended
		mg/m3	Exposure Limits
	TWA	1.000000	USA. NIOSH Recommended
		mg/m3	Exposure Limits
	ST	3.000000	USA. NIOSH Recommended
		mg/m3	Exposure Limits
	С	5.000000	USA. Occupational Exposure Limits
		mg/m3	(OSHA) - Table Z-1 Limits for Air
			Contaminants
	Ceiling limit	is to be determined	from breathing-zone air samples.
	TWA	1.000000	USA. NIOSH Recommended
		mg/m3	Exposure Limits
	ST	3.000000	USA. NIOSH Recommended
		mg/m3	Exposure Limits
	TWA	0.200000	USA. ACGIH Threshold Limit Values
		mg/m3	(TLV)
	Central Nerv	ous System impai	rment
			nclosed are those for which changes
	are propose	d in the NIC	_
	See Notice of	of Intended Change	es (NIC)
	varies		
	TWA	0.100000	USA. ACGIH Threshold Limit Values
		mg/m3	(TLV)
		ous System impai	rment
	2015 Adopti	on	
	varies	T	T
	TWA	0.020000	USA. ACGIH Threshold Limit Values
		mg/m3	(TLV)
		ous System impai	rment
	2015 Adopti	on	
	varies	1	THO A MICOLL D
	TWA	1 mg/m3	USA. NIOSH Recommended
	CT	2/ 2	Exposure Limits
	ST	3 mg/m3	USA. NIOSH Recommended
	T\\\\\\	0.4 2	Exposure Limits
	TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		ous System impai	
		ble as a human ca	rcinogen
	varies		T
	TWA	0.02 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Central Nervous System impairment		
	Not classifiable as a human carcinogen		
	varies		

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.

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Body Protection

Impervious clothing, 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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

Form: powder a) Appearance

Colour: grey

b) Odour No data available Odour Threshold No data available рΗ d) No data available

Melting point/freezing

Melting point/range: 1,244 °C (2,271 °F) - lit.

f) Initial boiling point and

boiling range

1,962 °C (3,564 °F) - lit.

g) Flash point ()Not applicable h) Evaporation rate No data available Flammability (solid, gas) No data available Upper/lower No data available

flammability or explosive limits

No data available k) Vapour pressure Vapour density No data available

m) Relative density 7.3 g/mL at 25 °C (77 °F)

n) Water solubility No data available o) Partition coefficient: n-No data available

octanol/water p) Auto-ignition

No data available

temperature q) Decomposition

No data available

temperature No data available r) Viscosity

s) Explosive properties No data available Oxidizing properties No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

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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

acids, Halogens, Bases, Phosphorus, Sulphur oxides, Peroxides

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Manganese/manganese 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 - 9,000 mg/kg(Manganese)

Inhalation: No data available(Manganese)

Dermal: No data available(Manganese)

No data available(Manganese)

Skin corrosion/irritation

Skin - Rabbit(Manganese)

Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit(Manganese)
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation

No data available(Manganese)

Germ cell mutagenicity

No data available(Manganese)

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.

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.

0 1 0 ,

Reproductive toxicity

No data available(Manganese)

May cause reproductive disorders. (Manganese)

Specific target organ toxicity - single exposure

No data available(Manganese)

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Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Manganese)

Additional Information

RTECS: 009275000

Men exposed to manganese dusts showed a decrease in fertility. Chronic man system. Early symptoms include languor, sleepiness and weakness in the le disturbances such as uncontrollable laughter and a spastic gait with tend cases. High incidence of pneumonia has been found in workers exposed to t(Manganese)

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence(Manganese)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and EC50 - Daphnia magna (Water flea) - 40 mg/l - 48 h(Manganese) other aquatic invertebrates

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Manganese)

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.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber b 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: 3208 Class: 4.3 Packing group: I

Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)

Poison Inhalation Hazard: No

IMDG

UN number: 3208 Class: 4.3 Packing group: I EMS-No: F-G, S-N Proper shipping name: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S. (Manganese)

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IATA

UN number: 3208 Class: 4.3 Packing group: I

Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)

IATA Passenger: Not permitted for transport

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

Manganese CAS-No. Revision Date 2007-07-01

SARA 311/312 Hazards

Reactivity Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Manganese CAS-No. Revision Date 2007-07-01

Pennsylvania Right To Know Components

Manganese CAS-No. Revision Date 7439-96-5 2007-07-01

New Jersey Right To Know Components

Manganese CAS-No. Revision Date 7439-96-5 2007-07-01

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.

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.

H260 In contact with water releases flammable gases which may ignite spontaneously.

H402 Harmful to aquatic life.

H412 Harmful to aquatic life with long lasting effects.

HMIS Rating

Health hazard: 0
Chronic Health Hazard: *
Flammability: 3
Physical Hazard 2

NFPA Rating

Health hazard: 0
Fire Hazard: 0
Reactivity Hazard: 2
Special hazard.1: W

Further information

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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: 05/28/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 3.15 Revision Date 03/05/2018 Print Date 06/28/2019

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

.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.

Sigma-Aldrich - 215457

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	90 - 100 %
	RE 1; Aquatic Acute 1; Aquatic	
	Chronic 1; H330, H360, H372,	
	H410	

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

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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	Basis
			parameters	
Mercury	7439-97-6	С	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	1	

TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
Central Nerv Kidney dama	ous System impai	rment	
Substances for which there is a Biological Exposure Index or Indices (see BEI® section)			
Not classifiable as a human carcinogen			
Danger of cu	ıtaneous absorptio	n	
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 multipurpose 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

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b) Odour odourless

Odour Threshold No data available No data available d) рΗ

Melting point/freezing Melting point/range: -38.87 °C (-37.97 °F) - lit. e)

point

f)

Initial boiling point and 356.6 °C (673.9 °F) - lit. boiling range

Flash point Not applicable

No data available h) Evaporation rate i) Flammability (solid, gas) No data available Upper/lower No data available i)

flammability or explosive limits

Vapour pressure < 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F)

1 hPa (1 mmHg) at 126 °C (259 °F)

I) 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

Decomposition

No data available

temperature r) Viscosity

s) Explosive properties

No data available No data available

No data available Oxidizing properties

9.2 Other safety information

> 6.93 - (Air = 1.0)Relative vapour density

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

Conditions to avoid 10.4

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

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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

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Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil

No data available

Results of PBT and vPvB assessment 12.5

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) Proper shipping name: A. W. Mercury

Reportable Quantity (RQ): 1 lbs Poison Inhalation Hazard: No

IMDG

IATA

UN number: 2809 Class: 8 (6.1)

Proper shipping name: Mercury

Packing group: III

Packing group: III

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.

CAC No

Davisian Data

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Mercury	7439-97-6	2015-11-23
Pennsylvania Right To Know Components		
Mercury	CAS-No. 7439-97-6	Revision Date 2015-11-23
Mercury	CAS-No. 7439-97-6	Revision Date 2015-11-23
New Jersey Right To Know Components	CAS-No	Revision Date

	CAO-NO.	Nevision Date
Mercury	7439-97-6	2015-11-23

California Prop. 65 Components

Sigma-Aldrich - 215457 Page 7 of 8 WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive

CAS-No. 7439-97-6 Revision Date 2013-12-20

harm. Mercury

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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 3.15 Revision Date: 03/05/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 4.16 Revision Date 06/20/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Methyl acetate

Product Number : W267600
Brand : Aldrich
Index-No. : 607-021-00-X

CAS-No. : 79-20-9

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

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225 Eve irritation (Category 2A), H319

Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

2.1



Signal word Danger

Hazard statement(s)

H225
 H319
 H336
 Highly flammable liquid and vapour.
 Causes serious eye irritation.
 May cause drowsiness or dizziness.

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. Use only outdoors or in a well-ventilated area. P271 P280 Wear protective gloves/ eye protection/ face protection. 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. IF IN EYES: Rinse cautiously with water for several minutes. Remove P305 + P351 + P338 contact lenses, if present and easy to do. Continue rinsing. P337 + P313 If eye irritation persists: Get medical advice/ attention. In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to P370 + P378 extinguish. Store in a well-ventilated place. Keep container tightly closed. P403 + P233 Store in a well-ventilated place. Keep cool. P403 + P235 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 : C3H6O2

Molecular weight : 74.08 g/mol

CAS-No. : 79-20-9

EC-No. : 201-185-2

Index-No. : 607-021-00-X

Registration number : 01-2119459211-47-XXXX

Hazardous components

Component	Classification	Concentration
Methyl acetate		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	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

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

Aldrich - W267600 Page 2 of 8

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.

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.

Moisture sensitive.

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

Components with w	orkpiace cont	roi paramete	15	
Component	CAS-No.	Value	Control parameters	Basis
Methyl acetate	79-20-9	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Eye damage Headache Nausea Dizziness	(degeneration of	ganglion cells in the retina)

STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)	
TWA	200 ppm 610 mg/m3	USA. NIOSH Recommended Exposure Limits	
ST	250 ppm 760 mg/m3	USA. NIOSH Recommended Exposure Limits	
TWA	200 ppm 610 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants	
The value	in mg/m3 is appro	ximate.	
PEL	200 ppm 610 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)	
STEL	250 ppm 760 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

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.

Splash contact

Material: butyl-rubber

Minimum layer thickness: 0.3 mm Break through time: 182 min

Material tested:Butoject® (KCL 897 / Aldrich Z677647, 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, 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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: clear, liquid

Colour: colourless

b) Odour like fruit

c) Odour Threshold No data availabled) pH No data available

e) Melting point/freezing

point

Melting point/range: -98 °C (-144 °F) - lit.

f) Initial boiling point and

boiling range

57 - 58 °C (135 - 136 °F) - lit.

g) Flash point -13 °C (9 °F) - closed cup - DIN 51755 Part 1

h) Evaporation rate No data availablei) Flammability (solid, gas) No data available

j) Upper/lower Upper explosion limit: 16 %(V) flammability or Lower explosion limit: 3 %(V)

explosive limits

k) Vapour pressure 217 hPa (163 mmHg) at 20 °C (68 °F)

I) Vapour density 2.8

m) Relative density 0.934 g/cm3 at 25 °C (77 °F)

n) Water solubility 319 g/l at 20 °C (68 °F)

o) Partition coefficient: n-

octanol/water

log Pow: 0.18

p) Auto-ignition 454 °C (849 °F) at 1,013 hPa (760 mmHg)

temperature

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 24 mN/m at 20 °C (68 °F)

Relative vapour density 2.8

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

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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 - 6,482 mg/kg

(OECD Test Guideline 401)

LC50 Inhalation - Rabbit - male and female - 4 h - 49.2 - 98.4 mg/l

LD50 Dermal - Rabbit - > 5,000 mg/kg

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: Irritating to eyes. (OECD Test Guideline 405)

Respiratory or skin sensitisation Germ cell mutagenicity

Ames test S. typhimurium

Result: negative

OECD Test Guideline 474 Rat - male and female

Result: negative

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 on OSHA's

list of regulated carcinogens.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

May cause drowsiness or dizziness. - Central nervous system

Specific target organ toxicity - repeated exposure

Aspiration hazard

No data available

Additional Information

Repeated dose Rat - male and female - Inhalation - NOAEL: 1,057 mg/m3 - OECD Test Guideline

toxicity 412

RTECS: AI9100000

narcosis, This product is metabolized into formic acid. Humans and other primates metabolize formic acid more slowly than do rodents. Formic acid can build up in the body producing toxic effects possibly leading to death; therefore, data from studies in rodents may have limited relevance for human risk assessment.

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12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish static test LC50 - Danio rerio (zebra fish) - 250 - 350 mg/l - 96 h

(OECD Test Guideline 203)

Toxicity to daphnia and

other aquatic

static test EC50 - Daphnia magna (Water flea) - 1,026.7 mg/l - 48 h

(OECD Test Guideline 202)

invertebrates

Toxicity to algae static test EC50 - Desmodesmus subspicatus (green algae) - > 120 mg/l - 72 h

(OECD Test Guideline 201)

Toxicity to bacteria EC50 - Pseudomonas putida - 6,000 mg/l - 16 h

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d

Result: 70 % - Readily biodegradable.

(OECD Test Guideline 301D)

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

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.

Packing group: II

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1231 Class: 3

M-41-. 1 - - - 1-1-

Proper shipping name: Methyl acetate Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG

UN number: 1231 Class: 3 Packing group: II EMS-No: F-E, S-D

Proper shipping name: METHYL ACETATE

IATA

UN number: 1231 Class: 3 Packing group: II

Proper shipping name: Methyl acetate

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

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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, Acute Health Hazard

Massachusetts Right To Know Components

p	CAS-No.	Revision Date
Methyl acetate	79-20-9	1993-02-16
Pennsylvania Right To Know Components		
	CAS-No.	Revision Date
Methyl acetate	79-20-9	1993-02-16

New Jersey Right To Know Components

Methyl acetate CAS-No. Revision Date 79-20-9 1993-02-16

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.

Eye Irrit. Eye irritation Flam. Liq. Flammable liquids

H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

STOT SE Specific target organ toxicity - single exposure

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.16 Revision Date: 06/20/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/26/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Naphthalene

Product Number : 147141 Brand : Aldrich Index-No. : 601-052-00-2

CAS-No. : 91-20-3

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 # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable solids (Category 2), H228

Acute toxicity, Oral (Category 4), H302

Carcinogenicity (Category 2), H351

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)

H228 Flammable solid. H302 Harmful if swallowed.

H351 Suspected of causing 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.

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.

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/ eye protection/ face

protection.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to

extinguish.

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

 Molecular weight
 : 128.17 g/mol

 CAS-No.
 : 91-20-3

 EC-No.
 : 202-049-5

 Index-No.
 : 601-052-00-2

Hazardous components

Component	Classification	Concentration
Naphthalene		
	Flam. Sol. 2; Acute Tox. 4;	<= 100 %
	Carc. 2; Aquatic Acute 1;	
	Aquatic Chronic 1; H228,	
	H302, H351, H410	

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.

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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

Carbon oxides

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 dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. 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

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wetbrushing 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 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. 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.

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

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Component	CAS-No.	Value	Control parameters	Basis		
Naphthalene	91-20-3	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)		
	Remarks	Hemolytic anemia Upper Respiratory Tract irritation Cataract Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption				
		TWA	10 ppm 50 mg/m3	USA. NIOSH Recommended Exposure Limits		
		ST	15 ppm 75 mg/m3	USA. NIOSH Recommended Exposure Limits		
		TWA	10 ppm 50 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants		
		The value in	n mg/m3 is appro	ximate.		
		PEL	0.1 ppm 0.5 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
Naphthalene	91-20-3	1-Naphthol + 2-Naphthol			ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible 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

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.

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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 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: flakes, granules

Colour: white

b) Odour aromatic

c) Odour Threshold No data availabled) pH No data available

e) Melting point/freezing

point

Melting point/range: 80 - 82 °C (176 - 180 °F) - lit.

f) Initial boiling point and boiling range

218 °C (424 °F) - lit.

g) Flash point 80.0 °C (176.0 °F) - closed cup

h) Evaporation rate No data availablei) Flammability (solid, gas) No data available

j) Upper/lower Upper explosion limit: 5.9 %(V) flammability or explosive limits Upper explosion limit: 0.9 %(V)

k) Vapour pressure

1.3 hPa at 53.0 °C (127.4 °F) 0.04 hPa at 25.0 °C(77.0 °F)

I) Vapour density No data available

m) Relative density 1.085 g/cm3 at 24.7 °C (76.5 °F)

n) Water solubility 0.0308 g/l at 25 °C (77 °F) - OECD Test Guideline 105 - slightly soluble

o) Partition coefficient: n-

octanol/water

log Pow: 3.4 at 25 °C (77 °F)

p) Auto-ignition temperature

526.0 °C (978.8 °F)

q) Decomposition temperature

No data available

r) Viscosity 1.05 mm2/s at 81.5 °C (178.7 °F) -

s) Explosive properties No data availablet) Oxidizing properties No data available

9.2 Other safety information

Surface tension 31.8 mN/m at 100.0 °C (212.0 °F)

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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

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

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 - 490.0 mg/kg

LC50 Inhalation - Rat - male and female - 4 h - > 0.4 mg/l

(OECD Test Guideline 403)

LD50 Dermal - Rabbit - 20,000 mg/kg

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Mild eye irritation

Respiratory or skin sensitisation

Maximisation Test - Guinea pig

Result: Does not cause skin sensitisation.

(OECD Test Guideline 406)

Germ cell mutagenicity

Ames test S. typhimurium Result: negative

Rat - male Result: negative

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Naphthalene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Naphthalene)

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

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

Repeated dose toxicity - Rat - male and female - Oral - No observed adverse effect level - 100 mg/kg - Lowest observed adverse effect level - 400 mg/kg

RTECS: QJ0525000

Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer., Naphthalene is retinotoxic and systemic absorption of its vapors above 15ppm, may result in:, cataracts, optic neuritis, corneal injury, Eye irritation, Ingestion may provoke the following symptoms:, hemolytic anemia, hemoglobinuria, Nausea, Headache, Vomiting, Gastrointestinal disturbance, Convulsions, anemia, Kidney injury may occur., Seizures., Coma.

Heart -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish flow-through test LC50 - Pimephales promelas (fathead minnow) - 7.9 mg/l

96 h(Naphthalene)

(OECD Test Guideline 203)

Toxicity to daphnia and

static test EC50 - Daphnia magna (Water flea) - 2.16 mg/l - 48 h(Naphthalene)

other aquatic invertebrates

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d(Naphthalene)

Result: 2 % - Not readily biodegradable.

12.3 Bioaccumulative potential

Bioaccumulation Fish(Naphthalene)

Bioconcentration factor (BCF): 427 - 1,158

12.4 Mobility in soil

No data available(Naphthalene)

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

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: 1334 Class: 4.1 Packing group: III

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Proper shipping name: Naphthalene, refined Reportable Quantity (RQ) : 100 lbs

Marine pollutant: no

Poison Inhalation Hazard: No

IMDG

UN number: 1334 Class: 4.1 Packing group: III EMS-No: F-A, S-G

Proper shipping name: NAPHTHALENE, REFINED

Marine pollutant : yes

IATA

UN number: 1334 Class: 4.1 Packing group: III

Proper shipping name: Naphthalene, refined

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

Naphthalene 91-20-3 2007-03-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

maccachactus mgm remain compensions		
	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-03-01

New Jersey Right To Know Components

men cence, mgm re ranen cempeneme		
	CAS-No.	Revision Date
Naphthalene	91-20-3	2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer.	91-20-3	2007-09-28

Naphthalene

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H228	Flammable solid.
H302	Harmful if swallowed

H351 Suspected of causing cancer. H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

HMIS Rating

i iiiii o i tatii ig	
Health hazard:	2
Chronic Health Hazard:	*
Flammability:	2
Physical Hazard	2

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NFPA Rating

Health hazard: 2
Fire Hazard: 2
Reactivity Hazard: 2

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.1 Revision Date: 05/26/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 3.15 Revision Date 03/05/2018 Print Date 06/28/2019

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

.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.

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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	90 - 100 %
	RE 1; Aquatic Acute 1; Aquatic	
	Chronic 1; H330, H360, H372,	
	H410	

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

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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

	Compensation with workplace control parameters				
Component	CAS-No.	Value	Control	Basis	
			parameters		
Mercury	7439-97-6	С	0.1 mg/m3	USA. NIOSH Recommended	
				Exposure Limits	
	Remarks	Potential for	dermal absorption	า	
		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	า		

TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
Central Nerv	ous System impai	rment
Kidney dama	age	
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 multipurpose 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

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b) Odour odourless

c) Odour Threshold No data availabled) pH No data available

e) Melting point/freezing Melting point/range: -38.87 °C (-37.97 °F) - lit.

point

f) Initial boiling point and 356.6 °C (673.9 °F) - lit. boiling range

g) Flash point Not applicableh) Evaporation rate No data availablei) Flammability (solid, gas) No data available

j) Upper/lower No data available flammability or explosive limits

k) Vapour pressure < 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) 1 hPa (1 mmHg) at 126 °C (259 °F)

I) Vapour density 6.93 - (Air = 1.0)

m) Relative density 13.55 g/cm3 at 25 $^{\circ}$ C (77 $^{\circ}$ F) n) Water solubility 0.00006 g/l at 25 $^{\circ}$ C (77 $^{\circ}$ F)

o) Partition coefficient: n- No octanol/water

No data available

p) Auto-ignition N

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

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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

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Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil

No data available

Results of PBT and vPvB assessment 12.5

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) Proper shipping name: A. W. Mercury

Reportable Quantity (RQ): 1 lbs Poison Inhalation Hazard: No

IMDG

IATA

UN number: 2809 Class: 8 (6.1)

Proper shipping name: Mercury

Packing group: III

Packing group: III

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.

CAC No

Davisian Data

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Mercury	7439-97-6	2015-11-23
Pennsylvania Right To Know Components		
Mercury	CAS-No. 7439-97-6	Revision Date 2015-11-23
Mercury	CAS-No. 7439-97-6	Revision Date 2015-11-23
New Jersey Right To Know Components	CAS-No	Revision Date

	CAO-NO.	Nevision Date
Mercury	7439-97-6	2015-11-23

California Prop. 65 Components

Sigma-Aldrich - 215457 Page 7 of 8 WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive

CAS-No. 7439-97-6

Revision Date 2013-12-20

harm. Mercury

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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 3.15 Revision Date: 03/05/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.2 Revision Date 05/25/2018 Print Date 06/29/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Phenanthrene

Product Number : P11409 Brand : Aldrich

CAS-No. : 85-01-8

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 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 # : +1-703-527-3887

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 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)

H302 Harmful if swallowed.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P264 Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth.

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

Photosensitizer.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight : 178.23 g/mol CAS-No. : 85-01-8 EC-No. : 201-581-5

Hazardous components

Component	Classification	Concentration
Phenanthrene		
	Acute Tox. 4; Aquatic Acute 1; Aquatic Chronic 1; H302, 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

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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. 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.

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

Component	CAS-No.	Value	Control	Basis	
			parameters		
Phenanthrene	85-01-8	TWA	0.200000	USA. Occupational Exposure Limits	
			mg/m3	(OSHA) - Table Z-1 Limits for Air	
				Contaminants	
		TWA	0.200000	USA. Occupational Exposure Limits	
			mg/m3	(OSHA) - Table Z-1 Limits for Air	
				Contaminants	
	Remarks	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 speci	fically regulated ca	rcinogen	
		TWA	0.100000	USA. NIOSH Recommended	
			mg/m3	Exposure Limits	
		Potential Occupational Carcinogen			
		NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar			
		products.			
		cyclohexane-extractable fraction			
		See Append	ix C		

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See Append	lix A	
PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
include fuse carcinogens petroleum (e Asphalt (CA	d polycyclic hyd) which volatilize excluding aspha	zene or cyclohexane-soluble fraction) rocarbons (some of which are known e from the distillation residues of coal, lt), wood, and other organic matter. and CAS 64742-93-4) is not covered atiles' standard.

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Phenanthrene	85-01-8	1- Hydroxypyren e		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at	end of worky	veek	

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

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

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. 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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form: solid Appearance

b) Odour No data available Odour Threshold No data available c) No data available

Melting point/freezing

point

Melting point/range: 98 - 100 °C (208 - 212 °F)

f) Initial boiling point and

boiling range

340 °C (644 °F)

g) Flash point No data available h) Evaporation rate No data available i) Flammability (solid, gas) No data available

Upper/lower flammability or explosive limits No data available

k) Vapour pressure No data available Vapour density No data available

m) Relative density 1.063 g/mL at 25 °C (77 °F)

n) Water solubility No data available o) Partition coefficient: nlog Pow: 4.46

octanol/water

p) Auto-ignition temperature

No data available

Decomposition temperature

No data available

No data available Viscosity s) Explosive properties No data available No data available Oxidizing properties

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

10.6 **Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Aldrich-P11409 Page 5 of 8 In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Mouse - 700.0 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

Causes photosensitivity. Exposure to light can result in allergic reactions resulting in dermatologic lesions, which can vary from sunburnlike responses to edematous, vesiculated lesions, or bullae

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 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 fish LC50 - Oncorhynchus mykiss (rainbow trout) - 3.2 mg/l - 96.0 h(Phenanthrene)

Toxicity to daphnia and EC5

EC50 - Daphnia pulex (Water flea) - 0.35 mg/l - 48 h(Phenanthrene)

other aquatic invertebrates

12.2 Persistence and degradability

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12.3 Bioaccumulative potential

Bioaccumulation Pimephales promelas (fathead minnow) - 28 d

- 0.00255 mg/l(Phenanthrene)

Bioconcentration factor (BCF): 5,100

12.4 Mobility in soil

No data available(Phenanthrene)

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.

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. (Phenanthrene)

Reportable Quantity (RQ) 5000 lbs

nο

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. (Phenanthrene)

Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Phenanthrene)

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**

85-01-8 2007-07-01 Phenanthrene

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

CAS-No. Aldrich-P11409 Page 7 of 8

Revision Date

Phenanthrene	85-01-8	2007-07-01
Pennsylvania Right To Know Components		
	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01
New Jersey Right To Know Components		
	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01
California Prop. 65 Components		
WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer.	85-01-8	2007-09-28
Phenanthrene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H302 Harmful if swallowed. H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard: 1
Chronic Health Hazard:
Flammability: 0
Physical Hazard 0

NFPA Rating

Health hazard: 1
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.2 Revision Date: 05/25/2018 Print Date: 06/29/2019

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SAFETY DATA SHEET

Version 5.8 Revision Date 07/28/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Phenol

Product Number : P1037

Brand : Sigma-Aldrich Index-No. : 604-001-00-2

CAS-No. : 108-95-2

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)

Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 3), H331

Acute toxicity, Dermal (Category 3), H311

Skin corrosion (Category 1B), H314

Serious eye damage (Category 1), H318

Germ cell mutagenicity (Category 2), H341

Specific target organ toxicity - repeated exposure (Category 2), H373

Acute aquatic toxicity (Category 3), H402

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 Danger

Hazard statement(s)

H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.
H341 Suspected of causing genetic defects.

H373 May cause damage to organs through prolonged or repeated exposure.

H402 Harmful to aquatic life.

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.
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 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse
	mouth.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing.
	Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for
	breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove
	contact lenses, if present and easy to do. Continue rinsing. Immediately
	call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: 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

Vesicant., Rapidly absorbed through skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Hydroxybenzene

Registration number : 01-2119471329-32-XXXX

Hazardous components

Component	Classification	Concentration
Phenol		
	Acute Tox. 3; Skin Corr. 1B;	90 - 100 %
	Eye Dam. 1; Muta. 2; STOT	
	RE 2; Aquatic Acute 3; Aquatic	
	Chronic 2; H301 + H311 +	
	H331, H314, H341, H373,	
	H402, H411	

For the full text of the H-Statements mentioned in this Section, see Section 16.

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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

Take off contaminated clothing and shoes immediately. 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. Continue rinsing eyes during transport to hospital.

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

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.

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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

Light sensitive. Handle and 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			
Phenol	108-95-2	TWA	5 ppm	USA. ACGIH Threshold Limit Values (TLV)			
	Remarks	Upper Resp Lung dama Substances (see BEI® s Not classifia	Central Nervous System impairment Upper Respiratory Tract irritation Lung 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	5 ppm 19 mg/m3	USA. NIOSH Recommended Exposure Limits			
		Potential for dermal absorption					
		С	15.6 ppm 60 mg/m3	USA. NIOSH Recommended Exposure Limits			
		Potential for dermal absorption 15 minute ceiling value					
		TWA	5 ppm 19 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants			
		Skin designation The value in mg/m3 is approximate.					
		PEL	5 ppm 19 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
Aromatic compound	-	Phenol	250mg/g Creatinine	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).

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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: 0.2 mm Break through time: 30 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 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

No data available b) Odour c) Odour Threshold No data available

6.0 d) рΗ

Melting point/freezing Melting point/range: 38 - 43 °C (100 - 109 °F)

point

Initial boiling point and 182.0 °C (359.6 °F)

boiling range

g) Flash point 79.0 °C (174.2 °F) - closed cup

h) Evaporation rate No data available Flammability (solid, gas) No data available

Upper/lower Upper explosion limit: 8.6 %(V) i) Lower explosion limit: 1.7 %(V) flammability or explosive limits

k) Vapour pressure 6.3 hPa (4.7 mmHg) at 55.0 °C (131.0 °F) 0.5 hPa (0.4 mmHg) at 20.0 °C (68.0 °F)

I) Vapour density No data available

1.07 g/cm3 m) Relative density

Sigma-Aldrich - P1037 Page 5 of 9 n) Water solubility 84 g/l at 20 °C (68 °F)

o) Partition coefficient: n-

octanol/water

log Pow: 1.46

p) Auto-ignition

715.0 °C (1,319.0 °F)

temperature

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 38.2 mN/m at 50.0 °C (122.0 °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, Strong acids

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 - 410.0 - 650.0 mg/kg

LD50 Oral - Rat - 317.0 mg/kg

Remarks: Behavioral:Convulsions or effect on seizure threshold.

LC50 Inhalation - Rat - 8 h - 900 mg/m3

LD50 Dermal - Rabbit - 630.0 mg/kg

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Severe skin irritation - 24 h

Serious eye damage/eye irritation

Eyes - Rabbit Result: Corrosive

(OECD Test Guideline 405)

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

In vitro tests showed mutagenic effects

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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

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

Additional Information

RTECS: SJ3325000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Circulatory collapse, tachypnea, paralysis, Convulsions, Coma., necrosis of mouth and G.I. Tract, Jaundice, respiratory failure, cardiac arrest 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 LC50 - Leuciscus idus (Golden orfe) - 14.00 - 25.00 mg/l - 48 h

LC50 - Carassius auratus (goldfish) - 36.10 - 68.80 mg/l - 96 h

Toxicity to daphnia and

other aquatic invertebrates

EC50 - Daphnia magna (Water flea) - 56 mg/l - 48 h

Toxicity to algae EC50 - Chlorella vulgaris (Fresh water algae) - 370.00 mg/l - 96 h

12.2 Persistence and degradability

Biodegradability Result: - Readily biodegradable.

12.3 Bioaccumulative potential

Bioaccumulation Danio rerio (zebra fish) - 5 h

- 2 mg/l

Bioconcentration factor (BCF): 17.5 Remarks: Does not bioaccumulate.

12.4 Mobility in soil

No data available

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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

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: 1671 Class: 6.1 Packing group: II

Proper shipping name: Phenol, solid Reportable Quantity (RQ): 1000 lbs Poison Inhalation Hazard: No

IMDG

UN number: 1671 Class: 6.1 Packing group: II EMS-No: F-A, S-A

Proper shipping name: PHENOL, SOLID

Marine pollutant:yes

IATA

UN number: 1671 Class: 6.1 Packing group: II

Proper shipping name: Phenol, solid

15. REGULATORY INFORMATION

SARA 302 Components

The following components are subject to reporting levels established by SARA Title III, Section 302:

CAS-No. Revision Date
Phenol 108-95-2 2007-07-01

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

CAS-No. Revision Date
Phenol 108-95-2 2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

CAS-No. Revision Date Phenol 108-95-2 2007-07-01

Pennsylvania Right To Know Components

CAS-No. Revision Date Phenol 108-95-2 2007-07-01

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.

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Acute Tox. Acute toxicity

Aquatic Acute Acute aquatic toxicity
Aquatic Chronic Chronic aquatic toxicity
Eye Dam. Serious eye damage
H301 Toxic if swallowed.

H301 + H311 + Toxic if swallowed, in contact with skin or if inhaled.

H331

H311 Toxic in contact with skin.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H331 Toxic if inhaled.

H341 Suspected of causing genetic defects.

H373 May cause damage to organs through prolonged or repeated exposure.

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 5.8 Revision Date: 07/28/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 4.11 Revision Date 04/13/2018 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Potassium

Product Number : 244856
Brand : Aldrich
Index-No. : 019-001-00-2

CAS-No. : 7440-09-7

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 1), H260

Skin corrosion (Category 1A), H314 Serious eye damage (Category 1), H318

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)

H260 In contact with water releases flammable gases which may ignite

spontaneously.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

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.

P260 Do not breathe dust or mist.

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/ protective clothing/ eye protection/ face

protection.

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated

clothing. Rinse skin with water/ shower.

P304 + P340 + P310 IF INHALED: Remove victim to fresh air and keep at rest in a position

comfortable for breathing. Immediately call a POISON CENTER or

doctor/ physician.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing. Immediately

call a POISON CENTER/doctor.

P335 + P334 Brush off loose particles from skin. Immerse in cool water/ wrap in wet

bandages.

P363 Wash contaminated clothing before reuse.

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.

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

Reacts violently with water.

May form explosive peroxides.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : K

 Molecular weight
 : 39.10 g/mol

 CAS-No.
 : 7440-09-7

 EC-No.
 : 231-119-8

 Index-No.
 : 019-001-00-2

Hazardous components

Component	Classification	Concentration
Potassium		
	Water-react. 1; Skin Corr. 1A; Eye Dam. 1; H260, H314,	90 - 100 %
	H318	

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

Take off contaminated clothing and shoes immediately. 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. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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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

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

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wetbrushing 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

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. 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.

Storage class (TRGS 510): 4.3: 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

Eve/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, 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: Ingots Colour: grey

Odour No data available c) Odour Threshold No data available

рH No data available

Melting point/freezing

point

b)

Melting point/range: 64 °C (147 °F) - lit.

Initial boiling point and

760 °C (1,400 °F) - lit.

boiling range

Flash point Not applicable

Aldrich - 244856 Page 4 of 8 h) Evaporation rate No data available
 i) Flammability (solid, gas) No data available
 j) Upper/lower No data available

flammability or explosive limits

k) Vapour pressure 0.12 hPa (0.09 mmHg) at 260 °C (500 °F)

l) Vapour density No data available

m) Relative density 0.86 g/cm3 at 25 °C (77 °F)

n) Water solubilityNo data availableo) Partition coefficient: n-No data available

octanol/water

p) Auto-ignition temperature

q) Decomposition temperature

No data available

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

Test for peroxide formation before using or discard after 3 months.

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

Oxidizing agents, Carbon oxides, Reacts violently with water., Reacts with water to generate Hydrogen gas.

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Potassium 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

Inhalation: No data available Dermal: No data available

LD50 Intraperitoneal - Mouse - 700 mg/kg

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

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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 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: TS6460000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

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

2.5 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: 2257 Class: 4.3 Packing group: I

Proper shipping name: Potassium

Reportable Quantity (RQ): Poison Inhalation Hazard: No

IMDG

UN number: 2257 Class: 4.3 Packing group: I EMS-No: F-G, S-N

Proper shipping name: POTASSIUM

IATA

UN number: 2257 Class: 4.3 Packing group: I

Proper shipping name: Potassium

IATA Passenger: Not permitted for transport

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

Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16
Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16
Pennsylvania Right To Know Components		
Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16
Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16
Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16
New Jersey Right To Know Components		
Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16
Potassium	CAS-No. 7440-09-7	Revision Date 1993-02-16

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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.

Eye Dam. Serious eye damage

H260 In contact with water releases flammable gases which may ignite spontaneously.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

Skin Corr. Skin corrosion

Water-react. Substances and mixtures, which in contact with water, emit flammable gases

HMIS Rating

Health hazard: 3
Chronic Health Hazard: Flammability: 4
Physical Hazard 2

NFPA Rating

Health hazard: 3
Fire Hazard: 4
Reactivity Hazard: 2
Special hazard.1: W

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 4.11 Revision Date: 04/13/2018 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Pyrene

Product Number : 185515 Brand : Aldrich

CAS-No. : 129-00-0

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 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 # : +1-703-527-3887

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

Rapidly absorbed through skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Benzo[<I>def</>]phenanthrene

Formula : C₁₆H₁₀

Molecular weight : 202.25 g/mol
CAS-No. : 129-00-0
EC-No. : 204-927-3

Hazardous components

Component	Classification	Concentration
Pyrene		
	Aquatic Acute 1; Aquatic	<= 100 %
	Chronic 1; H410	

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

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

Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. For personal protection see section 8.

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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 combu formation should be taken into consideration before additional processing

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.

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	Basis		
	100.00.0	T10/0	parameters	1104 0 " 15		
Pyrene	129-00-0	TWA	0.200000	USA. Occupational Exposure Limits		
			mg/m3	(OSHA) - Table Z-1 Limits for Air		
				Contaminants		
		TWA	0.200000	USA. Occupational Exposure Limits		
			mg/m3	(OSHA) - Table Z-1 Limits for Air		
				Contaminants		
	Remarks	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 speci	fically regulated ca	rcinogen		
		TWA	0.100000	USA. NIOSH Recommended		
			mg/m3	Exposure Limits		
		Potential Oc	cupational Carcino	ogen		
		NIOSH cons	iders coal tar, coal	tar pitch, and creosote to be coal tar		
		products.				
		cyclohexane	-extractable fraction	on		
		See Appendix C				
		See Append				
Dialogical accurati		1::4				

Biological occupational exposure limits

ziological cocapational expectato ininto					
Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Pyrene	129-00-0	1- Hydroxypyren e (1-HP)		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

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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: 0.4 mm Break through time: 480 min

Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm Break through time: 30 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 industria 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 le (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: crystalline

Colour: yellow

b) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing

point

Melting point/range: 145 - 148 °C (293 - 298 °F) - lit.

f) Initial boiling point and

....

390.0 - 395.0 °C (734.0 - 743.0 °F)

boiling range

g) Flash point > 200.0 °C (> 392.0 °F)

h) Evaporation rate No data available

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i) Flammability (solid, gas) No data available

j) Upper/lower flammability or explosive limits No data available

k) Vapour pressure No data availablel) Vapour density No data availablem) Relative density 1.21 g/cm3

n) Water solubility No data availableo) Partition coefficient: n- log Pow: 4.88

octanol/water
p) Auto-ignition

No data available

q) Decomposition temperature

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

Bulk density 650 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

Risk of dust explosion.

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

Dermal: No data available(Pyrene)

No data available(Pyrene)

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation

No data available(Pyrene)

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Germ cell mutagenicity

No data available(Pyrene)

Carcinogenicity

No data available(Pyrene)

(Pyrene)

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: OSHA specifically regulated carcinogen (Pyrene)

Reproductive toxicity

No data available(Pyrene)

No data available(Pyrene)

Specific target organ toxicity - single exposure

No data available(Pyrene)

Specific target organ toxicity - repeated exposure

Aspiration hazard

No data available(Pyrene)

Additional Information

RTECS: UR2450000

Inhalation studies in animals have caused:, Liver toxicity, pulmonary pathologies, intragastric pathologies, neutropenia, leukopenia, anemia, Contact with skin can cause:, hyperemia, weight loss, hematopoietic changes, Dermatitis, Chronic effects, leukocytosis(Pyrene)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) - > 2 mg/l - 96.0 h(Pyrene)

Toxicity to daphnia and

EC50 - Daphnia magna (Water flea) - 0.002 - 0.003 mg/l - 48 h(Pyrene)

other aquatic invertebrates

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation other fish - 48 h

- 0.056 mg/l(Pyrene)

Bioconcentration factor (BCF): 4,810

12.4 Mobility in soil

No data available(Pyrene)

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.

Avoid release to the environment.

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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. (Pyrene)

5000 lbs Reportable Quantity (RQ)

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. (Pyrene)

Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III

Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (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

The following components are subject to reporting levels established by SARA Title III, Section 302:

CAS-No. **Revision Date** 129-00-0 2008-11-03

Revision Date

2008-11-03

Pyrene

Pyrene

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.

CAS-No.

129-00-0

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

Pyrene	129-00-0	2008-11-03
Pennsylvania Right To Know Components		
	CAS-No.	Revision Date
Pyrene	129-00-0	2008-11-03
New Jersey Right To Know Components		
, ,	CAS-No	Revision Date

California Prop. 65 Components

WARNING! This product contains a chemical known to the	CAS-No.	Revision Date
State of California to cause cancer.	129-00-0	2007-09-28

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16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 3.12 Revision Date 05/04/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Silver

Product Number : 85131 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	90 - 100 %
	Chronic 1; H410	

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.

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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. Store under inert gas.

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.

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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: crystalline
b) Odour No data available
c) Odour Threshold No data available
d) pH No data available

e) Melting point/freezing Melting point/range: 960 °C (1,760 °F) - lit.

point

f) Initial boiling point and 2,212 °C (4,014 °F) - lit.

boiling range

g) Flash point No data available
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available

j) Upper/lower No data available

flammability or explosive limits

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k) Vapour pressure
 l) Vapour density
 m) Relative density
 n) Water solubility
 n) Partition coefficient: noctanol/water
 No data available
 No data available
 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

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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

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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

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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
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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 3.12 Revision Date: 05/04/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.2 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sodium

Product Number : 483745 Brand : Aldrich

CAS-No. : 7440-23-5

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 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 # : +1-703-527-3887

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 1), H260 Skin corrosion (Category 1B), H314 Serious eye damage (Category 1), H318

Carcinogenicity (Category 1A), H350

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)

H260 In contact with water releases flammable gases which may ignite

spontaneously.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H350 May cause cancer.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
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.
P260	Do not breathe dust or mist.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P363	Wash contaminated clothing before reuse.
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.
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

Reacts violently with water.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : Na

Molecular weight : 22.99 g/mol

Hazardous components

Component		Classification	Concentration
Sodium			
CAS-No. EC-No. Index-No.	7440-23-5 231-132-9 011-001-00-0	Water-react. 1; Skin Corr. 1B; Eye Dam. 1; H260, H314	>= 90 - <= 100 %
Paraffin oils			
CAS-No. EC-No.	8012-95-1 232-384-2	Asp. Tox. 1; H304, H304	>= 90 - <= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

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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

Take off contaminated clothing and shoes immediately. 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. Continue rinsing eyes during transport to hospital.

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

Dry powder

5.2 Special hazards arising from the substance or mixture

Carbon oxides, Sodium 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.

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 wetbrushing 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

Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing

Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking.

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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.

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

•	CAS No	•		Pagia			
Component	CAS-No.	Value	Control	Basis			
D 66: 11	2242.25.4	0.7.51	parameters	1104 40001171			
Paraffin oils	8012-95-1	STEL	10.000000	USA. ACGIH Threshold Limit Values			
			mg/m3	(TLV)			
		TWA	5.000000	USA. Occupational Exposure Limits			
			mg/m3	(OSHA) - Table Z-1 Limits for Air			
				Contaminants			
		TWA	5.000000	USA. NIOSH Recommended			
			mg/m3	Exposure Limits			
		ST	10.000000	USA. NIOSH Recommended			
			mg/m3	Exposure Limits			
		TWA	5.000000	USA. Occupational Exposure Limits			
		IVVA					
			mg/m3	(OSHA) - Table Z-1 Limits for Air			
				Contaminants			
		TWA	5.000000	USA. ACGIH Threshold Limit Values			
			mg/m3	(TLV)			
	Remarks	Upper Res	piratory Tract irrita	ation			
		2015 Adop	tion				
			able as a human	carcinogen			
			Upper Respiratory Tract irritation 2015 Adoption				
		Exposure by all routes should be carefully controlled to levels as low					
			as possible.				
			Suspected human carcinogen				
		TWA	5.000000	USA. Occupational Exposure Limits			
			mg/m3	(OSHA) - Table Z-1 Limits for Air			
				Contaminants			
		TWA	5.000000	USA. Occupational Exposure Limits			
			mg/m3	(OSHA) - Table Z-1 Limits for Air			
				Contaminants			
		Upper Respiratory Tract irritation					
				ld be carefully controlled to levels as low			
		as possible					
			, human carcinoge	an			
		TWA	5.000000	USA. ACGIH Threshold Limit Values			
		IVVA					
		11	mg/m3	(TLV)			
			piratory Tract irrita				
			able as a human				
		TWA	5.000000	USA. NIOSH Recommended			
			mg/m3	Exposure Limits			
		ST	10.000000	USA. NIOSH Recommended			
			mg/m3	Exposure Limits			
		Upper Res	piratory Tract irrita				
				ld be carefully controlled to levels as low			
		as possible					
				an a			
		Suspecied	human carcinoge	 			

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TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	espiratory Tract irri ifiable as a human	
TWA	5 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
ST	10 mg/m3	USA. NIOSH Recommended Exposure Limits

Hazardous components without 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

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 industria 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 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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: Pieces

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b) Odourc) Odour Thresholdd) pHNo data availableNo data availableNo data available

e) Melting point/freezing

point

Melting point/range: 97.8 °C (208.0 °F) - lit.

f) Initial boiling point and

883 °C (1621 °F) - lit.

boiling range

g) Flash point 82 °C (180 °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 No data available

l) Vapour density No data available

m) Relative density 0.97 g/cm3

n) Water solubility No data available
 o) Partition coefficient: n- No data available octanol/water

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

Air Do not allow water to enter container.

Exposure to moisture

10.5 Incompatible materials

Oxidizing agents

10.6 Hazardous decomposition products

Other decomposition products - No data available

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sodium oxides In the event of fire: see section 5

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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.

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: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Aspiration may lead to:, lipid pneumonia, Effects due to ingestion may include:, laxative effect, Gastrointestinal disturbance, 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

Burn in a chemical incinerator equipped with an afterburner and scrubber b 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. Dissolve or mix the material with a combustible solvent and burn in a chem scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1428 Class: 4.3 Packing group: I

Proper shipping name: Sodium

Reportable Quantity (RQ) : 10 lbs

Poison Inhalation Hazard: No.

IMDG

UN number: 1428 Class: 4.3 Packing group: I EMS-No: F-G, S-N

Proper shipping name: SODIUM

IATA

UN number: 1428 Class: 4.3 Packing group: I

Proper shipping name: Sodium

IATA Passenger: Not permitted for transport

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, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Sodium	7440-23-5	1993-04-24
Paraffin oils	8012-95-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Sodium	7440-23-5	1993-04-24
Paraffin oils	8012-95-1	2007-03-01

New Jersey Right To Know Components

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 CAS-No.
 Revision Date

 Sodium
 7440-23-5
 1993-04-24

 Paraffin oils
 8012-95-1
 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.

Asp. Tox. Aspiration hazard Eye Dam. Serious eye damage

H260 In contact with water releases flammable gases which may ignite spontaneously.

H304 May be fatal if swallowed and enters airways. H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H350 May cause cancer. Skin Corr. Skin corrosion

Water-react. Substances and mixtures, which in contact with water, emit flammable gases

HMIS Rating

Health hazard: 3
Chronic Health Hazard: *
Flammability: 4
Physical Hazard 2

NFPA Rating

Health hazard: 3
Fire Hazard: 4
Reactivity Hazard: 2
Special hazard.1: W

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.2 Revision Date: 05/28/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Thallium

Product Number : 277932 Brand : Aldrich Index-No. : 081-001-00-3

CAS-No. : 7440-28-0

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 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 # : +1-703-527-3887

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 2), H300 Acute toxicity, Inhalation (Category 2), H330 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)

H300 + H330 Fatal if swallowed or if inhaled

H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

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.
P284 Wear respiratory protection.

P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse

mouth.

P304 + P310 IF INHALED: Remove person to fresh air and keep comfortable for

breathing. Immediately call a POISON CENTER/doctor.

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 : T

Molecular weight : 204.38 g/mol CAS-No. : 7440-28-0 EC-No. : 231-138-1 Index-No. : 081-001-00-3

Hazardous components

Component	Classification	Concentration
Thallium		
	Acute Tox. 2; Aquatic Acute 3;	<= 100 %
	Aquatic Chronic 3; H300 +	
	H330, H412	

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.

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5.2 Special hazards arising from the substance or mixture

thallium 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

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 combu formation should be taken into consideration before additional processing 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.

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	Basis	
			parameters		
Thallium	7440-28-0	TWA	0.100000	USA. ACGIH Threshold Limit Values	
			mg/m3	(TLV)	
	Remarks	Alopecia			
		Adopted values or notations enclosed are those for which changes			
		are proposed in the NIC			
		2010 Revision or addition to the notice of intended changes			
		See Notice of Intended Changes (NIC)			
		Danger of cutaneous absorption			
		TWA	0.020000	USA. ACGIH Threshold Limit Values	
			mg/m3	(TLV)	
		Peripheral neuropathy			
		Gastrointestinal damage			
		2015 Adoption			
		Danger of cutaneous absorption			
		TWA	0.020000	USA. ACGIH Threshold Limit Values	
			mg/m3	(TLV)	
		Peripheral neuropathy			
		Gastrointestinal damage			

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Danger of cutaneous absorption varies			
TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants	
Skin designation			
TWA	0.02 mg/m3	USA. ACGIH Threshold Limit Values (TLV)	
Peripheral neuropathy Gastrointestinal damage			
Danger of cutaneous absorption varies			
TWA	0.1 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 Eve/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 industria 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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

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Colour: light grey

b) Odour No data available Odour Threshold No data available d) рН No data available

Melting point/freezing e)

point

Melting point/range: 303 °C (577 °F) - lit.

Initial boiling point and f)

boiling range

1,457 °C (2,655 °F) - lit.

g) Flash point ()Not applicable h) Evaporation rate No data available i) Flammability (solid, gas) No data available

Upper/lower flammability or explosive limits No data available

Vapour pressure No data available Vapour density No data available m) Relative density No data available n) Water solubility No data available Partition coefficient: n-No data available

octanol/water

Auto-ignition temperature

No data available

Decomposition temperature

No data available

No data available Viscosity r) No data available Explosive properties 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.

Possibility of hazardous reactions 10.3

No data available

10.4 Conditions to avoid

Air sensitive.

10.5 Incompatible materials

Strong acids, Strong oxidizing agents

Hazardous decomposition products 10.6

Hazardous decomposition products formed under fire conditions. - thallium oxides Other decomposition products - No data available

In the event of fire: see section 5

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11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data availableThallium

Dermal: No data available(Thallium)

No data available(Thallium)

Skin corrosion/irritation

No data available(Thallium)

Serious eye damage/eye irritation

No data available(Thallium)

Respiratory or skin sensitisation

No data available(Thallium)

Germ cell mutagenicity

No data available(Thallium)

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.

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

Possible risk of congenital malformation in the fetus.(Thallium)

No data available(Thallium)

Specific target organ toxicity - single exposure

No data available(Thallium)

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Thallium)

Additional Information

RTECS: XG3425000

The most characteristic symptom of thallium exposure is alopecia (loss of impairment of nail growth often resulting in the appearance of crescent-s Other symptoms in acute poisoning relate chiefly to the gastrointestinal system. Acute poisoning results in swelling of the feet and legs, arthral the hands and feet, mental confusion, polyneuritis with severe pain in thangina-like pains, nephritis, wasting and weakness, and lymphocytosis and peripheral nervous system abnormalities may persist including ataxia, tre disorders, memory loss, and psychoses may develop., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Thallium)

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Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence(Thallium)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Cyprinodon variegatus (sheepshead minnow) - 21.0 mg/l - 96.0

h(Thallium)

mortality NOEC - Cyprinodon variegatus (sheepshead minnow) - 14.0 mg/l -

96.0 h(Thallium)

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Thallium)

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 chem scrubber.

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. (Thallium)

Reportable Quantity (RQ) : 1000 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. (Thallium)

IATA

UN number: 3288 Class: 6.1 Packing group: II Proper shipping name: Toxic solid, inorganic, n.o.s. (Thallium)

15. REGULATORY INFORMATION

SARA 302 Components

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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 7440-28-0 2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

CAS-No. Revision Date 7440-28-0 2007-07-01

Pennsylvania Right To Know Components

CAS-No. Revision Date

Thallium 7440-28-0 2007-07-01

New Jersey Right To Know Components

CAS-No. Revision Date

Thallium 7440-28-0 2007-07-01

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.

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.

H300 Fatal if swallowed.

H300 + H330 Fatal if swallowed or if inhaled

H330 Fatal if inhaled.

H402 Harmful to aquatic life.

H412 Harmful 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

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.1 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Vanadium(V) oxide

Product Number : 221899
Brand : Aldrich
Index-No. : 023-001-00-8

CAS-No. : 1314-62-1

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 # : +1-703-527-3887

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 4), H332

Serious eye damage (Category 1), H318

Germ cell mutagenicity (Category 2), H341

Reproductive toxicity (Category 2), H361

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Specific target organ toxicity - repeated exposure (Category 1), H372

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 Danger

Hazard statement(s)

H302 + H332 Harmful if swallowed or if inhaled

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H318 H335 H341 H361 H372 H411	Causes serious eye damage. May cause respiratory irritation. Suspected of causing genetic defects. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. Toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
P201 P202	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P260 P264	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. 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.
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 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
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 : O_5V_2

 Molecular weight
 : 181.88 g/mol

 CAS-No.
 : 1314-62-1

 EC-No.
 : 215-239-8

 Index-No.
 : 023-001-00-8

Hazardous components

Component	Classification	Concentration
Vanadium pentoxide		
	Acute Tox. 4; Eye Dam. 1; Muta. 2; Repr. 2; STOT SE 3; STOT RE 1; Aquatic Acute 2; Aquatic Chronic 2; H302 + H332, H318, H335, H341, H361, H372, H411	<= 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.

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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

Vanadium/vanadium 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 contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing

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.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control	Basis
			parameters	
Vanadium pentoxide	1314-62-1	С	0.100000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
		С	0.500000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
	Remarks	Ceiling limit	is to be determined	d from breathing-zone air samples.
		TWA	0.050000	USA. ACGIH Threshold Limit Values
			mg/m3	(TLV)
		Upper Respi	iratory Tract irritation	on
		Lower Respi	iratory Tract irritation	on
		Substances	for which there is a	a Biological Exposure Index or Indices
		(see BEI® se	ection)	
				with unknown relevance to humans
		С	0.050000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		15 minute ce	eiling value	
		С	0.050000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		15 minute ce	eiling value	
		С	0.100000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
		Ceiling limit	is to be determined	d from breathing-zone air samples.
		С	0.500000	USA. Occupational Exposure Limits
			mg/m3	(OSHA) - Table Z-1 Limits for Air
				Contaminants
		Ceiling limit	is to be determined	d from breathing-zone air samples.
		С	0.050000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		15 minute ce	eiling value	
		С	0.050000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		15 minute ce		
		С	0.050000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		15 minute ce		
		С	0.050000	USA. NIOSH Recommended
			mg/m3	Exposure Limits
		15 minute ce		
		TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values
				(TLV)
		Upper Respi	iratory Tract irritation	
			iratory Tract irritation	
				with unknown relevance to humans
		С	0.1 mg/m3	USA. Occupational Exposure Limits
			3.1.11.9,1110	(OSHA) - Table Z-1 Limits for Air
	Ì			
				Contaminants

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С	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants		
Ceiling	Ceiling limit is to be determined from breathing-zone air sa			
С	0.05 mg/m3	USA. NIOSH Recommended		
		Exposure Limits		
15 minu	ite ceiling value			
С	0.05 mg/m3	USA. NIOSH Recommended		
		Exposure Limits		
15 minu	15 minute ceiling value			

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological	Basis	
				specimen		
Vanadium pentoxide	1314-62-1	Vanadium	0.0500	In urine		
			mg/g			
	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

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 industria 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing

point

Melting point/range: 690 °C (1274 °F) - lit.

f) Initial boiling point and

boiling range

No data available

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

I) Vapour density No data available

m) Relative density 3.35 g/cm3 at 25 °C (77 °F)

n) Water solubility 904 g/l at 20 °C (68 °F) - OECD Test Guideline 105

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 availables) Explosive properties No data available

Oxidizing properties The substance or mixture is not classified as oxidizing.

9.2 Other safety information

Solubility in other

solvents

Ethanol - insoluble

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

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10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Vanadium/vanadium 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

Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2) Vanadium pentoxide

LC50 Inhalation - Rat - female - 4 h - 2.21 mg/l(Vanadium pentoxide)

(OECD Test Guideline 403)

LC50 Dermal - Rat - > 2,500 mg/kg(Vanadium pentoxide)

(OECD Test Guideline 402)

No data available(Vanadium pentoxide)

Skin corrosion/irritation

Skin - in vitro assay(Vanadium pentoxide)

Result: No skin irritation

Serious eye damage/eye irritation

Eyes - Rabbit(Vanadium pentoxide)

Result: Risk of serious damage to eyes.

(OECD Test Guideline 405)

Respiratory or skin sensitisation

No data available(Vanadium pentoxide)

Germ cell mutagenicity

Laboratory experiments have shown mutagenic effects. (Vanadium pentoxide)

In vitro tests showed mutagenic effects(Vanadium pentoxide)

Carcinogenicity

No data available(Vanadium pentoxide)

(Vanadium pentoxide)

(Vanadium pentoxide)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Vanadium pentoxide)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Vanadium pentoxide)

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

Possible risk of congenital malformation in the fetus.(Vanadium pentoxide)

Suspected human reproductive toxicant(Vanadium pentoxide)

No data available(Vanadium pentoxide)

Specific target organ toxicity - single exposure

May cause respiratory irritation.(Vanadium pentoxide)

Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

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Aspiration hazard

No data available(Vanadium pentoxide)

Additional Information

RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Vanadium pentoxide)

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence(Vanadium pentoxide)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Oncorhynchus mykiss (rainbow trout) - 5.2 mg/l - 96.0 h(Vanadium

pentoxide)

Toxicity to daphnia and

LC50 - Daphnia magna (Water flea) - 1.52 mg/l - 48 h(Vanadium pentoxide)

other aquatic invertebrates

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available(Vanadium pentoxide)

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

Toxic to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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 chem scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2862 Class: 6.1 Packing group: III

Proper shipping name: Vanadium pentoxide Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 2862 Class: 6.1 Packing group: III EMS-No: F-A, S-A

Proper shipping name: VANADIUM PENTOXIDE

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Marine pollutant : yes

IATA

UN number: 2862 Class: 6.1 Packing group: III

Proper shipping name: Vanadium pentoxide

15. REGULATORY INFORMATION

SARA 302	Components
-----------------	------------

The following components are subject to reporting levels established by SARA Title III, Section 302:

CAS-No. Revision Date 1314-62-1 2007-07-01

Vanadium pentoxide

SARA 313 Components

CAS-No. Revision Date

Vanadium pentoxide 1314-62-1 2007-07-01

The following components are subject to reporting levels established by SARA Title III, Section 313:

CAS-No. Revision Date 1314-62-1 2007-07-01

Vanadium pentoxide

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Vanadium pentoxide CAS-No. Revision Date 2007-07-01

Pennsylvania Right To Know Components

Vanadium pentoxide CAS-No. Revision Date 2007-07-01

New Jersey Right To Know Components

Vanadium pentoxide CAS-No. Revision Date 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 2007-09-28

Vanadium pentoxide

WARNING! This product contains a chemical known to the CAS-No. Revision Date State of California to cause cancer. 1314-62-1 2007-09-28

Vanadium pentoxide

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H302	Harmful if swallowed.
H302 + H332	Harmful if swallowed or if inhaled
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H341	Suspected of causing genetic defects.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
11404	Tayle to agreetic life

H401 Toxic to aquatic life.

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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: 3
Fire Hazard: 0
Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety – Americas Region 1-800-521-8956

Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

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SAFETY DATA SHEET

Version 6.0 Revision Date 05/28/2017 Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Zinc

Product Number : 324930

Brand : Aldrich

Index-No. : 030-001-00-1

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 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 # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Pyrophoric solids (Category 1), H250

Self-heating substances and mixtures (Category 1), H251

Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260

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)

H250 Catches fire spontaneously if exposed to air.

H251 Self-heating: may catch fire.

H260 In contact with water releases flammable gases which may ignite

spontaneously.

H410 Very toxic to aquatic life with long lasting effects.

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Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P222 Do not allow contact with air.
P223 Do not allow contact with water.

P231 + P232 Handle under inert gas. Protect from moisture.

P235 + P410 Keep cool. Protect from sunlight.
P273 Avoid release to the environment.

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 to

extinguish.

P391 Collect spillage.

P402 + P404 Store in a dry place. Store in a closed container.

P407 Maintain air gap between stacks/ pallets.

P413 Store bulk masses greater than .? kg/ .? lbs at temperatures not

exceeding .? °C/ .? °F.

P420 Store away from other materials. P422 Store contents under inert gas.

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

3.1 Substances

Formula : Zn

 Molecular weight
 : 65.39 g/mol

 CAS-No.
 : 7440-66-6

 EC-No.
 : 231-175-3

 Index-No.
 : 030-001-00-1

Hazardous components

Component	Classification	Concentration
Zinc powder (pyrophoric)		
	Pyr. Sol. 1; Self-heat. 1;	<= 100 %
	Water-react. 1; Aquatic Acute	
	1; Aquatic Chronic 1; H250,	
	H251, H260, H410	

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.

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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

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. 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

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wetbrushing 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).

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 combu formation should be taken into consideration before additional processing

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.

Keep in a dry place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Hazardous components without 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

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.

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 industria 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 (EN 143) respirator cartridges as a backup to engineering controls. If th 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) Odourc) Odour Thresholdd) pHNo data availableNo data available

e) Melting point/freezing

point

Melting point/range: 420 °C (788 °F) - lit.

f) Initial boiling point and

boiling range

907 °C (1665 °F) - lit.

g) Flash point ()No data available

h) Evaporation rate No data available

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i) Flammability (solid, gas) May form combustible dust concentrations in air.

Upper/lower No data available

flammability or explosive limits

1 hPa at 487 °C (909 °F) k) Vapour pressure

Vapour density No data available

7.133 g/mL at 25 °C (77 °F) m) Relative density

n) Water solubility No data available

o) Partition coefficient: n-

octanol/water

log Pow: 5

p) Auto-ignition The substance or mixture is classified as self heating with the category 1.,

temperature The substance or mixture is pyrophoric with the category 1.

q) Decomposition

temperature

No data available

Viscosity No data available r) s) Explosive properties No data available No data available Oxidizing properties

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.

Possibility of hazardous reactions 10.3

Reacts violently with water.

10.4 Conditions to avoid

Exposure to moisture

10.5 Incompatible materials

Strong acids and oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Zinc/zinc 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 availableZinc powder (pyrophoric)

Inhalation: No data available(Zinc powder (pyrophoric)) Dermal: No data available(Zinc powder (pyrophoric))

No data available(Zinc powder (pyrophoric))

Skin corrosion/irritation

No data available(Zinc powder (pyrophoric))

Serious eye damage/eye irritation

No data available(Zinc powder (pyrophoric))

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Respiratory or skin sensitisation

Did not cause sensitisation on laboratory animals.(Zinc powder (pyrophoric))

Germ cell mutagenicity

No data available(Zinc powder (pyrophoric))

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(Zinc powder (pyrophoric))

No data available(Zinc powder (pyrophoric))

Specific target organ toxicity - single exposure

No data available(Zinc powder (pyrophoric))

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available(Zinc powder (pyrophoric))

Additional Information

RTECS: ZG8600000

chills, dry throat, sweet taste, Fever, Cough, Nausea, Vomiting, Weakness(Zinc powder (pyrophoric)) To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Zinc powder (pyrophoric))

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish LC50 - Cyprinus carpio (Carp) - 450.0 µg/l - 96.0 h(Zinc powder (pyrophoric))

Toxicity to daphnia and

other aquatic invertebrates

LC50 - Daphnia magna (Water flea) - 0.068 mg/l - 48 h(Zinc powder

(pyrophoric))

mortality NOEC - Daphnia (water flea) - 0.101 - 0.14 mg/l - 7 d(Zinc powder

(pyrophoric))

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation Algae - 7 d

at 16 °C - 5 μg/l(Zinc powder (pyrophoric))

Bioconcentration factor (BCF): 466

12.4 Mobility in soil

No data available(Zinc powder (pyrophoric))

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

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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 b 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: 1436 Class: 4.3 (4.2) Packing group: II

Proper shipping name: Zinc powder

Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1436 Class: 4.3 (4.2) Packing group: II EMS-No: F-G, S-O

Proper shipping name: ZINC POWDER

Marine pollutant : yes

IATA

UN number: 1436 Class: 4.3 (4.2) Packing group: II

Proper shipping name: Zinc powder

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:

Zinc powder (pyrophoric)

CAS-No. Revision Date
7440-66-6
1993-04-24

SARA 311/312 Hazards

Reactivity Hazard

Massachusetts Right To Know Components

Zinc powder (pyrophoric)

CAS-No. Revision Date
7440-66-6
1993-04-24

Pennsylvania Right To Know Components

Zinc powder (pyrophoric) CAS-No. Revision Date 7440-66-6 1993-04-24

New Jersey Right To Know Components

Zinc powder (pyrophoric)

CAS-No. Revision Date
7440-66-6
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.

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16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H250 Catches fire spontaneously if exposed to air.

Self-heating: may catch fire. H251

H260 In contact with water releases flammable gases which may ignite spontaneously.

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: 3 Physical Hazard 1

NFPA Rating

Health hazard: 0 Fire Hazard: 3 Reactivity Hazard: 1 Special hazard.I: W

Further information

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Preparation Information

Sigma-Aldrich Corporation Product Safety - Americas Region

1-800-521-8956

Version: 6.0 Revision Date: 05/28/2017 Print Date: 06/28/2019

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APPENDIX E QUALITY ASSURANCE PROJECT PLAN

Quality Assurance Project Plan

Proposed SNL Storage Facility 1440-1460 39th Street Brooklyn, New York 11218

1.0 PROJECT DESCRIPTION

This document presents the Quality Assurance Project Plan (QAPP) for the remedial investigation (RI) for the proposed development at 1440-1460 39th Street, Brooklyn, New York (the "Site").

The Site consists of an approximately 0.57-acre area parcel located at 1440-1460 39th Street, Kings County, Brooklyn, New York. The Site is currently improved by the building slabs and foundations left in-place following recent demolition activities of the former two (2) single-story structures. The former site building operations included warehouse and office space uses. Approximately 0.45 acres of the Site was covered by the structures. The remaining estimated 0.12 acres of the Site is improved by concrete or asphalt surface cover. **Figure 2.1** of the Interim Remedial Measure Work Plan (IRM) presents a Site Location Map.

The Site is located in a residential and commercial area and is bounded by 39th Street to the north, beyond which lies a school, auto repair and maintenance services, and commercial/industrial warehouses; to the east by commercial retail and warehouses; to the south by residential properties; and to the west by commercial retail and warehouses. The Site has been developed since the 1920s and was historically occupied by automotive repair, poultry storage, and unspecified manufacturing operations. **Figure 2.2** of the RAWP presents a Site Plan.

2.0 PROJECT ORGANIZATION

The RIWP will be conducted by Soils Engineering Services, Inc. (SESI), on behalf of SNL XXII, LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below.

2.1 Project Principal

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

Provide technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3 Project Manager

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

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

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.

2.5 Quality Assurance Officer

Responsible for will reviewing sampling procedures and certify that the data was collected and analyzed using the appropriate procedures.

3.0 QA/QC OBJECTIVES FOR MEASUREMENT OF DATA

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. Analytical Service Protocol (ASP, June 2000) Category B deliverables are required for all samples.

Detection limits set by NYSDEC-ASP 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 Applicable or Relevant and Appropriate Requirements [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 (June 2000). Data will be 100 percent compliant with NYSDEC-ASP requirements.

The number of duplicate, spiked and blank samples analyzed will a minimum of 1 duplicate for every 20 samples per each medium of groundwater and soil. The inclusion

and frequency of analysis of field blanks will be on the order of one per every 20 samples (soil) for the aqueous matrix field blanks will be collected at a frequency of one per day. Samples to be analyzed for volatile organic compounds will be accompanied by a trip blank for each shipment and field blanks (water matrix) or field blanks (soil).

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 samples only. . Soil samples will be collected from the excavator bucket or macro-core devices retrieved from soil borings.4.1.1 Drilling/Sampling Procedures

4.1.2 Monitoring Well Completion

No monitoring wells are planned to be installed as part of the IRM. Monitoring well completion procedures are outlined in the QAPP submitted with the RIWP.

4.1.3 Well Development

No wells are planned to be developed as part of the IRM. Well development procedures are outlined in the QAPP submitted with the RIWP.

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 scrape the equipment from any residual soils and then rinse with water and Alconox®. Every effort will be made to minimize the generation of contaminated water.

4.2 Groundwater Sampling Program.

4.2.1 Well Evacuation

Monitoring well sampling is not planned as part of the IRM. Well purging procedures are outlined in the QAPP submitted with the RIWP.

4.2.2 Sampling Procedure

Monitoring well sampling is not planned as part of the IRM. Well purging procedures are outlined in the QAPP submitted with the RIWP.

4.3 Soil Vapor Sampling

Soil vapor sampling is not planned as part of the IRM. Soil vapor sampling procedures are outlined in the QAPP submitted with the RIWP.

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 brim full with no air bubbles. 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 guidelines outlined in the ASP.

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 samples 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

ice 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 depending on parameter holding times.

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 ASP. The calibration of instruments used for the determination of metals will be as described in the appropriate CLP 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 (June 2000) 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 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 PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

DEC has developed a list of 21 PFAS Analytes List on table 7.1 for remedial programs. Currently, ELAP does not offer certification for Per- and polyfluoroalkyl substances (PFAS) compounds in matrices other than finished drinking water. Per the NYSDEC October 2020 guidance document on emergent contaminant sampling, the analytical procedure for soil and groundwater sampling of PFAS is Modified EPA Method 537. Reporting limits for PFOA and PFOS in groundwater should not exceed 2 ng/L.

7.6 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	Aqueous Samples								
VOCs – USEPA 8260C	2	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2	14 days					
SVOCs (BNAs) – USEPA 8270D	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)					
Metals ⁽²⁾	1	1-liter, plastic bottle	Nitric acid to pH <2 NaOH for cyanide	180 days Cyanide: 14 days Mercury: 28 days					
Soil, Sediment, Solid Wa	aste Sample								
VOCs – USEPA 8260C	3	15-gram EnCore samplers	None	14 days					
SVOCs (BNAs) – USEPA 8270D	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 S	amples	1							
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 (NYSDEC-CLP 11/87). Metals will be analyzed by Method 6010D, 7471B for mercury, and 9012B for cyanide

⁽³⁾ A complete list of compounds is provided on Table 7.1.

TABLE 4.2 – SAMPLING PROCEDURE FOR MONITORING WELLS USING VOLUME AVERAGED PURGING

- 1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.
- 2. Calculate water column volume from the gauged water depth and well depth
- 3. Sampling device lowered into well.
 - a. Bailer lowered by dedicated PVC or polypropylene line.
 - b. Empty 3-5 well volumes based on the calculated water volume from 2 above.
- 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. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.
- 7. 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.
- 8. The original will be returned following sample analysis.
 - a. A second carbon copy is kept on file.
- **9.** 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

Target Compound List (TCL) and Contract-Required Quantitation Limit

SEC	SECTION 1 - ASP INORGANICS Method: Method 6010D, 7471B for mercury, and 9012B for cyanide						
	PARAMETER	METHOD DETECTION LIMIT * (μg/l)		PARAMETER	METHOD DETECTION LIMIT * (µg/I)		
1.	Aluminum	18.8	13.	Magnesium	73.7		
2.	Antimony	0.399	14.	Manganese	2.88		
3.	Arsenic	0.734	15.	Mercury	0.115		
4.	Barium	1.16	16.	Nickel	2.36		
5.	Beryllium	0.245	17.	Potassium	86.7		
6.	Cadmium	0.808	18.	Selenium	5.35		
7.	Calcium	98.8	19.	Silver	0.591		
8.	Chromium	2.3	20.	Sodium	128		
9.	Cobalt	1.6	21.	Thallium	0.157		

	10.	Copper	1.99	22.	Vanadium	1.11
Ī	11.	Iron	51.1	23.	Zinc	11.1
Ī	12.	Lead	0.552	24.	Cyanide	0.004

	SECTION 2 - ASP ORGANICS (VOLATILES) Method 8260C						
VOLATILE		METHOD DETECTION LIMIT * (μg/l)		VOLATILE	METHOD DETECTION LIMIT * (µg/I)		
1.	Chloromethane	0.143	18.	1,2-Dichloropropane	0.455		
2.	Bromomethane	1	19.	cis-1,3- Dichloropropene	0.455		
3.	Vinyl Chloride	0.171	20.	Trichloroethene	0.314		
4.	Chloroethane	0.320	21.	Dibromochloromethane	0.281		
5.	Methylene Chloride	0.315	22.	1,1,2-Trichloroethane	0.433		
6.	Acetone	4.98	23.	Benzene	0.428		
7.	Carbon Disulfide	0.155	24.	Trans-1.3- Dichloropropene	0.485		
8.	1,1-Dichloroethylene	0.117	25.	Bromoform	0.536		
9.	1,1-Dichloroethane	0.264	26.	2-Hexanone	2.90		
10.	1,2-Dichloroethylene (total)	0.219	27.	4-Methyl, 1,2- Pentanone	2.73		
11.	Chloroform	0.326	28.	Tetrachloroethylene	0.249		
12.	1,2-Dichloroethane	0.430	29.	Toluene	0.379		
13.	2-Butanone	1.85	30.	Chlorobenzene	0.377		
14.	1,1,1-Trichloroethane	0.238	31.	Ethylbenzene	0.298		
15.	Carbon Tetrachloride	0.208	32.	Styrene	0.415		
16.	Bromodichloromethane	0.343	33.	Total Xylenes	0.361		
17.	1,1,2,2- Tetrachloroethane	0.367					

	SECTION 3 - ASP ORGANICS (SEMI-VOLATILES) Method 8270D									
	SEMI-VOLATILE	METHOD DETECTION LIMIT * (μg/l)		SEMI-VOLATILE	METHOD DETECTION LIMIT * (μg/l)					
1.	Phenol	0.292	33.	Acenaphthene	1.08					
2.	Bis(2-chloroethyl)ether	0.295	34.	2,4-Dinitrophenol	14.4					
3.	2-Chlorophenol	0.377	35.	4-Nitrophenol	0.689					
4.	1,3-Dichlorobenzene	0.13	36.	Dibenzofuran	1.10					
5.	1,4-Dichlorobenzene	0.13	37.	Dinitrotoluene	20					
6.	1,2-Dichlorobenzene	0.12	38.	Diethylphthalate	0.976					
7.	2-Methylphenol	0.259	39.	4-Chlorophenyl phenyl ether	1.28					
8.	2,2'oxybis(1- Chloropropane)	0.629	40.	Fluorene	0.912					
9.	4-Methylphenol	0.235	41.	4-Nitroanile	.0543					
10.	N-Nitroso-dipropylamine	0.430	42.	4,6-Dinitro-2- methylphenol	13.3					
11.	Hexachloroethane	1.19	43.	N-nitrosodiphenyl amine	0.891					
12.	Nitrobenzene	0.567	44.	4-Bromophenyl phenyl ether	0.745					
13.	Isophorone	0.798	45.	Hexachlorobenzene	0.396					
14.	2-Nitrophenol	0.747	46.	Pentachlorophenol	1.45					
15.	2,4-Dimethylphenol	0.238	47.	Phenanthrene	0.580					
16.	Bis(2-Chloroethoxy) methane	0.239	48.	Anthracene	0.634					
17.	2,4-Dichlorophenol	0.421	49.	Carbazole	0.679					
18.	1,2,4-Trichlorobenzene	0.11	50.	Di-n-butyl phthalate	0.840					
19.	Naphthalene	1.13	51.	Fluoranthene	0.842					
20.	4-Chloroaniline	1.88	52.	Pyrene	1.64					
21.	Hexachlorobutadiene	0.780	53.	Butyl benzyl phthalate	0.854					
22.	4-Chloro-3-methylphenol	0.575	54.	3,3'-Dichloro benzidine	1.43					
23.	2-Methylnaphthalene	1.10	55.	Benzo(a)anthracene	0.592					
24.	Hexachlorocyclopentadiene	1.72	56.	Chrysene	0.907					
25.	2,4,6-Trichlorophenol	0.299	57.	Bis(2-ethylhexyl) phthalate	1.70					
26.	2,4,5-Trichlorophenol	0.279	58.	Di-n-octyl phthalate	4.75					
27.	2-Chloronapthalene	1.18	59.	Benzo(b)fluoranthene	1.14					
28.	2-Nitroananiline	0.474	60.	Benzo(k)fluoranthene	0.674					
29.	Dimethyl phthalate	0.976	61.	Benzo(a)pyrene	0.405					
30.	Acenaphthylene	0.823	62.	Indeno(1,2,3-cd)	1.29					
31.	2,6-Dinitrotoluene	0.390	63.	Dibenz(a,h) anthracene	0.720					
32.	3-Nitroaniline	0.962	64.	Benzo(g,h,i)perylene	1.43					

SEC	TION 3 - ASP ORGANICS (P	ESTICIDES/PCBS)	Pestic	ides Method 8081B, PCE	Bs Method 8082A
	PESTICIDE/PCB	METHOD DETECTION LIMIT * (μg/l)		PESTICIDE/PCB	METHOD DETECTION LIMIT * (µg/I)
1.	Alpha-BHC	0.007	15.	4,4'-DDT	0.004
2.	Beta-BHC	0.004	16.	Methoxychlor	0.004
3.	Delta-BHC	0.005	17.	Endrin ketone	0.008
4.	Gamma-BHC (lindane)	0.012	18.	Endrin aldehyde	0.008
5.	Heptachlor	0.003	19.	Alpha-Chlordane	0.055
6.	Aldrin	0.003	20.	Gamma-Chlordane	0.055
7.	Heptachlor epoxide	0.005	21.	Toxaphene	0.11
8.	Endosulfan I	0.002	22.	AROCHLOR-1016	0.119
9.	Dieldrin	0.003	23.	AROCHLOR-1221	0.119
10.	4,4'-DDE	0.002	24.	AROCHLOR-1232	0.119
11.	Endrin	0.004	25.	AROCHLOR-1242	0.119
12.	Endosulfan II	0.004	26.	AROCHLOR-1248	0.119
13.	4,4'-DDD	0.006	27.	AROCHLOR-1254	0.107
14.	Endosulfan sulfate	0.006	28.	AROCHLOR-1260	0.107

^{*}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

1440-1460 39th Street Brooklyn, New York

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the remediation for the proposed development at 1440-1460 39th Street, Brooklyn, New York (Site).

The Site was accepted into the New York Brownfield Cleanup Program (BCP) by the New York Department of Environmental Conservation (NYSDEC) pursuant to execution of a Brownfield Cleanup Agreement ("BCA") on August 24, 2020 (BCP Site No. C224311). The Site is currently improved by the building slabs and foundations left in-place following recent demolition activities of two (2) single-story structures. The Site topography is generally level and flat and includes 0.57 acres. The Site is located in a commercial, industrial, and residential area and is bounded by 39th Street to the north, beyond which lies a school (Bais Tziporah), auto repair and maintenance services, and commercial/industrial warehouses; to the east by commercial retail and warehouses; to the south by residential properties; and to the west by commercial retail and warehouses. The Site has been developed since the 1920s and was historically occupied by automotive repair, poultry storage, and unspecified manufacturing operations.

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 continuous monitoring for particulate matter (e.g., airborne "dust") and volatile organic compounds (VOCs) during the planned remedial excavation and construction activities. Readings will be recorded and will be available and submitted

for State (DEC and DOH) personnel to review on a weekly basis, with all exceedances reported to the DEC and DOH on the same day or on the following business day (if after hours) along with the reason for exceedance(s), corrective actions taken, and the effectiveness of the corrective actions.

1.3 PERIODIC MONITORNG

Periodic monitoring for VOCs will be conducted during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

1.4 VOC MONITORNG, RESPONSE LEVELS, AND ACTIONS

VOC Monitoring, Response Levels, and Actions Levels for 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. 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.

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 the15-minute average, work activities must be temporarily halted
and monitoring continued. If the total organic vapor level readily decreases (per

instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work 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.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

1.5 PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

• If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

• If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

1.5 SPECIAL REQUIREMENTS FOR WORK WITHIN 20 FEET OF POTENTIALLY EXPOSED INDIVIDUAL STRUCTURES

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next
 to intake vents exceed 150 mcg/m3, work activities should be suspended until
 controls are implemented and are successful in reducing the total particulate
 concentration to 150 mcg/m3 or less at the monitoring point.

 Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be predetermined, as necessary, for each site.

APPENDIX G NYSDEC SOIL CLEANUP OBJECTIVES

375-6.8

Soil cleanup objective tables.Unrestricted use soil cleanup objectives. (a)

Table 375-6.8(a):Unrestricted Use Soil Cleanup Objectives

Contaminant	CAS Number	Unrestricted Use
	Metals	
Arsenic	7440-38-2	13 °
Barium	7440-39-3	350 °
Beryllium	7440-41-7	7.2
Cadmium	7440-43-9	2.5 °
Chromium, hexavalent ^e	18540-29-9	1 ^b
Chromium, trivalent ^e	16065-83-1	30 °
Copper	7440-50-8	50
Total Cyanide e, f		27
Lead	7439-92-1	63 °
Manganese	7439-96-5	1600 °
Total Mercury		0.18 °
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9°
Silver	7440-22-4	2
Zinc	7440-66-6	109 °
	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 °
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°
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
Semivolat	tile organic compo	ounds
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°
Benzo(a)pyrene	50-32-8	1°
Benzo(b)fluoranthene f	205-99-2	1°
Benzo(g,h,i)perylene f	191-24-2	100
Benzo(k)fluoranthene f	207-08-9	0.8 °
Chrysene ^f	218-01-9	1°
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 °
m-Cresol ^f	108-39-4	0.33 ^b
Naphthalene ^f	91-20-3	12
o-Cresol ^f	95-48-7	0.33 в

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	e organic compour	nds
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°
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

	CAS Number]	Protection of 1	Protection of	Protection of		
Contaminant		Residential	Restricted- Residential	Commercial	Industrial	Ecological Resources	Ground- water
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	100ª	500 ^b	1,000°	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

	CAS	I	Protection of 1	Protection of	Protection of		
Contaminant	Number	Residential	Restricted- Residential	Commercial	Industrial	Ecological Resources	Ground- water
delta-BHC	319-86-8	100 ^a	100 ^a	500 ^b	1,000°	$0.04^{\rm g}$	0.25
Dibenzofuran	132-64-9	14	59	350	1,000°	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°
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°	20	98
Acenapthylene	208-96-8	100 ^a	100 ^a	500 ^b	1,000°	NS	107
Anthracene	120-12-7	100 ^a	100 ^a	500 ^b	1,000°	NS	1,000°
Benz(a)anthracene	56-55-3	$1^{\rm f}$	1 ^f	5.6	11	NS	$1^{\rm f}$
Benzo(a)pyrene	50-32-8	$1^{\rm f}$	$1^{\rm f}$	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°	NS	1,000°
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°
Fluoranthene	206-44-0	100 ^a	100 ^a	500 ^b	1,000°	NS	1,000°
Fluorene	86-73-7	100 ^a	100ª	500 ^b	1,000°	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	100ª	500 ^b	1,000°	NS	0.33 ^e
Naphthalene	91-20-3	100ª	100ª	500 ^b	1,000°	NS	12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

	CAS]	Protection of 1	Protection of	Protection of		
Contaminant	Number	Residential	Restricted- Residential	Commercial	Industrial	Ecological Resources	Ground- water
o-Cresol	95-48-7	100ª	100ª	500 ^b	1,000°	NS	0.33 ^e
p-Cresol	106-44-5	34	100ª	500 ^b	1,000°	NS	0.33 ^e
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8e	$0.8^{\rm e}$
Phenanthrene	85-01-8	100ª	100ª	500 ^b	1,000°	NS	1,000°
Phenol	108-95-2	100ª	100ª	500 ^b	1,000°	30	0.33 ^e
Pyrene	129-00-0	100 ^a	100ª	500 ^b	1,000°	NS	1,000°
Volatiles							
1,1,1-Trichloroethane	71-55-6	100ª	100ª	500 ^b	1,000°	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100ª	100ª	500 ^b	1,000°	NS	0.33
1,2-Dichlorobenzene	95-50-1	100ª	100ª	500 ^b	1,000°	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	100ª	500 ^b	1,000°	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100ª	100ª	500 ^b	1,000°	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	0.1e	0.1 ^e
Acetone	67-64-1	100 ^a	100 ^b	500 ^b	1,000°	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100 ^a	100ª	500 ^b	1,000°	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100ª	100ª	500 ^b	1,000°	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	100ª	100ª	500 ^b	1,000°	100ª	0.12

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

	CAS	1	Protection of 1	Protection of	Protection of		
Contaminant	Number	Residential	Restricted- Residential	Commercial	Industrial	Ecological Resources	Ground- water
Methyl tert-butyl ether	1634-04-4	62	100 ^a	500 ^b	1,000°	NS	0.93
Methylene chloride	75-09-2	51	100°	500 ^b	1,000°	12	0.05
n-Propylbenzene	103-65-1	100 ^a	100 ^a	500 ^b	1,000°	NS	3.9
sec-Butylbenzene	135-98-8	100 ^a	100 ^a	500 ^b	1,000°	NS	11
tert-Butylbenzene	98-06-6	100 ^a	100 ^a	500 ^b	1,000°	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°	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	100ª	100ª	500 ^b	1,000°	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.