

**SUBSURFACE INVESTIGATION WORK PLAN**

FEBRUARY 2018

COLLEGE POINT OIL LAGOON  
123<sup>RD</sup> STREET AND 31<sup>ST</sup> AVENUE  
COLLEGE POINT, NEW YORK  
NYSDEC SITE# 241001

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## 1.0 INTRODUCTION

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This document represents the subsurface investigation work plan (SIWP) to investigate subsurface soil, groundwater and soil vapor conditions at the subject site. The site is located on 123<sup>rd</sup> Street south of 31<sup>st</sup> Avenue in College Point, Queens. The work plan has been prepared in association with New York State Department of Environmental Conservation (NYSDEC) site number 241001. A site location map is included as Appendix A-1 and a site map is included as Appendix A-2.

As directed by the NYSDEC, the SIWP scope of work at this site will include:

- Soil sample collection at approximately 20 predetermined temporary soil boring (SB) locations.
- At up to 10 of the temporary sampling locations, following soil sample collection, groundwater monitoring wells (MWs) will be installed, developed and sampled.
- Installation of six soil vapor monitoring points (VMP).

### 1.1 GENERAL SITE SETTING

The project area is located on a peninsula in north-west Long Island, in the neighborhood of College Point, Queens. College Point is bound by the mouth of Flushing Creek to the south and southeast, Flushing Bay to the south and west, the East River to the north and the Queens neighborhoods of Flushing, Whitestone and Malba to the east. The immediately surrounding area is industrial/commercial with residential properties approximately 0.4 miles to the north. A site location map is included as Appendix A-1.

The area of investigation includes 31-89 123rd Street (northern subdivision) and 31-99 123rd Street (southern subdivision); subdivisions of real property parcel Section 22, Block 4392 and Lot 25, Borough of Queens. As per the access agreement with the NYSDEC and as confirmed with NYC Department of Finance (DOF) Digital Tax Map, the current owner this property is 123 Plaza, LLC of Long Island City, NY. 123 Plaza LLC took ownership of the property on February 14, 2008 from Premier Properties LLC.

The northern subdivision is approximately 74,730 square feet (1.7-acres) and is occupied by a 2-story building with a footprint of approximately 19,900-square feet. This building is constructed with a sub-grade garage and entrance ramp on the south side of the building. Currently, Dish Network leases 31-89 123<sup>rd</sup> Street. According to NYSDEC record, there is one 4,000 gallon gasoline underground storage tank (UST) that was closed in-place on March 19, 2008.

The southern subdivision is approximately 76,750-square feet (1.8-acres) and is occupied by a 2-story building with a footprint of approximately 19,570-square feet. It is unknown if the building has a basement. Currently, Varsity Plumbing leases 31-99 123<sup>rd</sup> Street. According to NYSDEC record, there is one 4,000 gallon UST that was closed in-place on June 1, 1994. The surfaces of both lots are covered with macadam/concrete pavement and serve as vehicle parking lots/driving lanes. A separate property parcel divides the southern extent of lot 31-99 from Flushing Creek/Bay.

Distances to bodies of water from the lots are detailed as follows:

<i>Body of Water</i>	<i>Direction from Site</i>	<i>Distance from nearest Site property line</i>	<i>Distance from the center of Oil Lagoon circa 1980</i>
Flushing Creek/Bay	Due South	60 feet	550 feet
Flushing Bay	Due West	420 feet	740 feet
East River	Northwest	2 miles	2 miles
Former Mill Creek	Due East	590 feet	750 feet

Notes:  
 nearest distance posted  
 distance measured in feet rounded to the nearest ten  
 distance measured in miles rounded to the nearest quarter mile

## 1.2 SITE HISTORY OVERVIEW

The following historical summary was compiled from documentation provided by the NYSDEC that includes details regarding the discovery, surveillance, clean-up and Phase II Site Assessments associated with College Point Oil Lagoon. Other sources of information used to support the NYSDEC documentation include available historical orthoimages and historical topographic maps. In 1983, College Point Oil Lagoon was listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Classification Code 4.

### 1.2.1 DEVELOPMENT OF THE PROJECT AREA

A review of available historical topographic maps indicate the area of investigation and immediate vicinity were tidal marshes through the late 1940's with some mechanical land development in the immediate surrounding area. By 1955, the tidal marsh was mechanically filled in for urban development which shaped the southern section of the current College Point landform. Appendix A-3 through Appendix A-5 show the development of the project area. The area of mechanically filled tidal marshes are currently occupied by mostly commercial and industrial business.

### 1.2.2 DISCOVERY AND INVESTIGATION OF COLLEGE POINT OIL LAGOON (1976-1980)

Review of files provided by the NYSDEC detailed the discovery and investigative activities associated with the College Point Oil Lagoon conducted by the US Coast Guard (USCG), NYSDEC Law Enforcement and NYSDEC Region II Pure Waters Division. During January 1976, an oil like substance was identified on Flushing Creek by the USCG. Upon investigation, the USCG identified the source of three separate pools located on NYC Public Development Corporation<sup>1</sup> (PDC) property. During February 1976, the USCG confirmed, with dye testing, that oil from the lagoon was seeping through a dike on the east side of the pond via an abandoned road (assumed 31<sup>st</sup> Road) to a storm drain that discharged to Flushing Creek. Analysis of liquid samples collected from the pools, from the street side of 31st Road (street name documented) and 124th St and from Flushing Creek by the USCG confirmed that the oil came from the same source. On February 23, 1976, the USCG issued a Pollution Incident Report and Water Pollution Violation Report to the NYCPDC.

In cooperation with the USCG, NYSDEC Environmental Conservation Officers (ECOs) conducted routine site visits and interviews of surrounding businesses/property owners and employees to surveil and investigate the illegal dumping from 1976 through the beginning of 1980. The NYSDEC recorded multiple references to complaints, observations and investigation of the material leaking from Oil Lagoon to Flushing Bay and onto adjacent properties via the north

<sup>1</sup> Many of the NYCPDC development projects are now overseen by the NYC Economic Development Corporation (EDC).

end of the lagoon(s). Observations of site modifications and activities after surveillance began included connection of at least two of the pools by use of machine to move barrier dirt (February 1976), illegal dumping of asphalt and other construction related debris and multiple fires on Oil Lagoon (February and April 1980). By August 1977, only one larger lagoon existed where there were originally three. A NYSDEC February 1980 Hazardous Waste Disposal Site Report estimated that the Lagoon was filled with approximately 350,000 gallons of polychlorinated biphenyl (PCB) contaminated liquid including approximately 15-inches of floating oil. The depth of the pool was said to vary up to 6-feet.

### 1.2.3 ANALYTICAL DATA PRIOR TO OIL LAGOON CLEAN-UP

The NYSDEC January 23, 1979 memorandum states that samples were collected from Oil Lagoon on June 13, 1978. Concentrations of 1260 Aroclor PCB in laboratory analyzed samples were reported as 160 mg/L in the 15-inch oil layer on surface of lagoon, non-detect in the lagoon water, 206 ug/g in the bottom sludge and 109 ug/g in the bottom sediment.

The samples collected from the oil and water layers were also analyzed for metals. Reported results have been included in the following table:

<i>Sample Location</i>	<i>Ni</i>	<i>Sn</i>	<i>Ag</i>	<i>Cd</i>	<i>Cr</i>	<i>Pb</i>	<i>Hg</i>	<i>Zn</i>	<i>Be</i>	<i>Cu</i>	<i>V</i>	<i>Fe</i>	<i>As</i>
15-inch oil layer on surface of lagoon	<0.05	*	*	<0.02	<0.1	<0.1	<0.0004	0.46	*	<0.05	<1	0.75	<0.02
Lagoon Water	2.90	<10	<0.20	0.50	3.1	580	*	83	<0.20	5.30	<10	*	*

Notes:  
 \* not analyzed  
 results reported in mg/L

In preparation for the Oil Lagoon Clean Up, a preliminary feasibility study<sup>2</sup> was conducted by RECRA Research, Inc. to design a plan for acceptable solidification of the Oil Lagoon contents to facilitate removal and transportation to a disposal facility. The study included laboratory analysis of an oil sample for PCBs. Reported results have been included in the following table:

<i>Sample Location</i>	<i>Aroclor</i>									
	<i>1016</i>	<i>1221</i>	<i>1232</i>	<i>1242</i>	<i>1248</i>	<i>1254</i>	<i>1260</i>	<i>1262</i>	<i>1268</i>	
Oil (ug/g)	<5	<10	<5	<5	<5	<5	110	<10	<5	

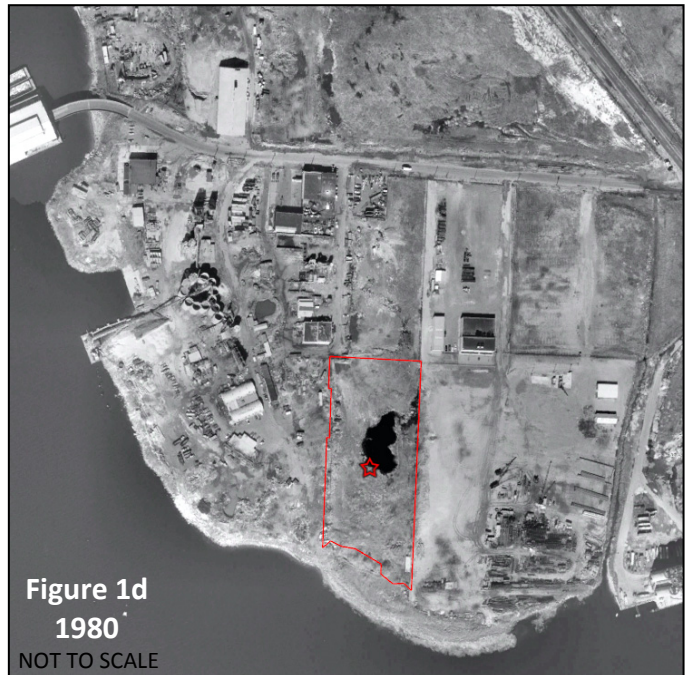
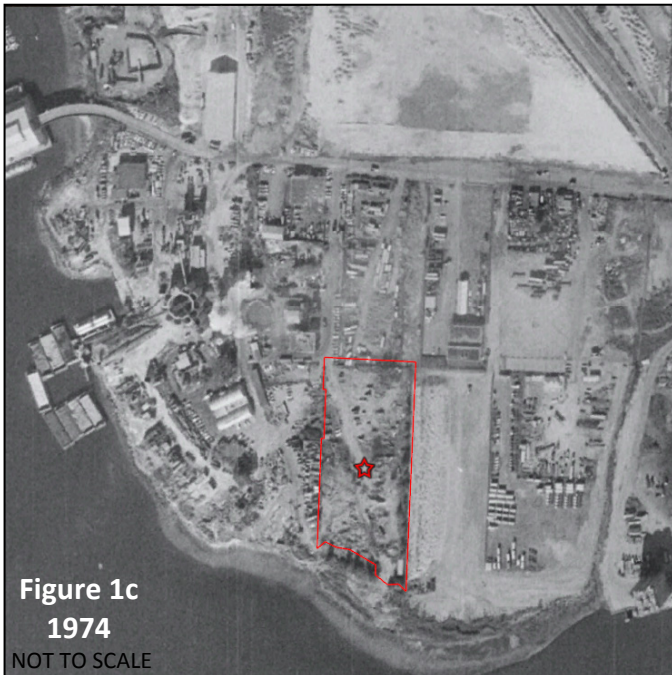
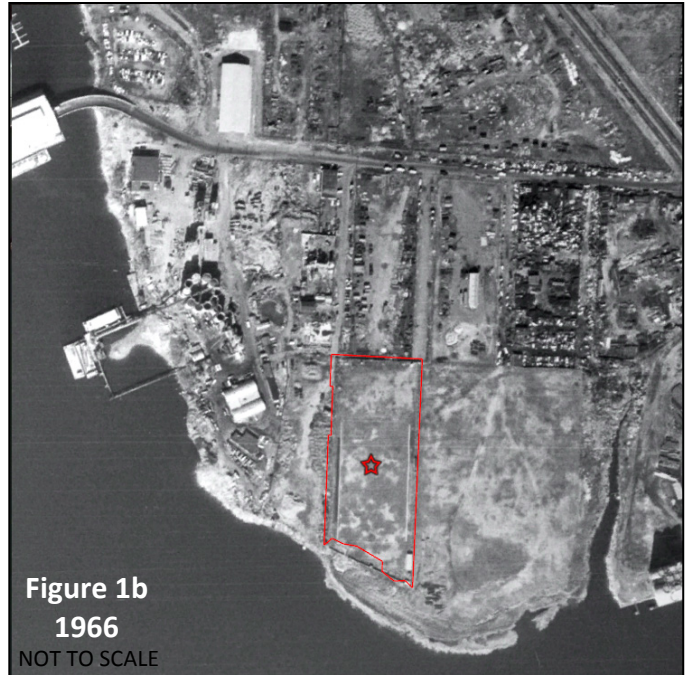
### 1.2.4 CLEAN-UP (1980)

Under the direction of the NYC Department of Environmental Protection (DEP), removal of contaminated media from Oil Lagoon began in August 1980 and continued through the beginning of November 1980. The work was performed by CECOS International, Inc of Niagara Falls, NY. The NYSDEC reported progress during periodic site visits. According to NYSDEC memorandum, the floating oil was mixed with flyash, recovered and hauled to a secure offsite location (Niagara, NY). The contaminated liquids were pumped off into temporary pools to allow for separation of the residual oil. The separated oil was recovered with oil adsorbent pads. All liquids were properly disposed off-site. As interpreted from NYSDEC documentation, the terminal depth of the Oil Lagoon excavation was 8 to 9 feet below grade (bg) at that time (prior to further site development).

<sup>2</sup>Preliminary Feasibility Study Regarding the Solidification and Transportation of PCB Contaminated Oil Wastes from College Point, New York, RECRA Research, Inc, Tonawanda, NY, 1980 June 23.

### 1.2.5 REVIEW OF HISTORICAL ORTHOIMAGES

Visual inspection of georeferenced orthoimage (GeoTIFF) files<sup>3</sup> from 1954, 1966, 1974 and 1980 confirm mechanical modifications and landscape development of Southern College Point. Development included filling of the tidal marsh, land surface grading and gradual development of the shoreline that extended the land surface to the south and west over time. The oil lagoon appears to be present in the 1980 orthoimage. The approximate location of the current property boundary has been outlined in red.



<sup>3</sup> GeoTiff orthoimages purchased from HistoricAerials.com.

To show the location of the former Oil Lagoon in comparison to the present-day site setting, the 1980 orthoimage has been geospatially superimposed and set as transparent over an August 2012 aerial photograph (the 2012 image is consistent with current land use). The approximate location of the current property boundary has been outlined in red. The estimated surface area of the Oil Lagoon, as shown in the 1980 orthoimage, is over 17,000-square feet (this includes the area along the eastern property line).



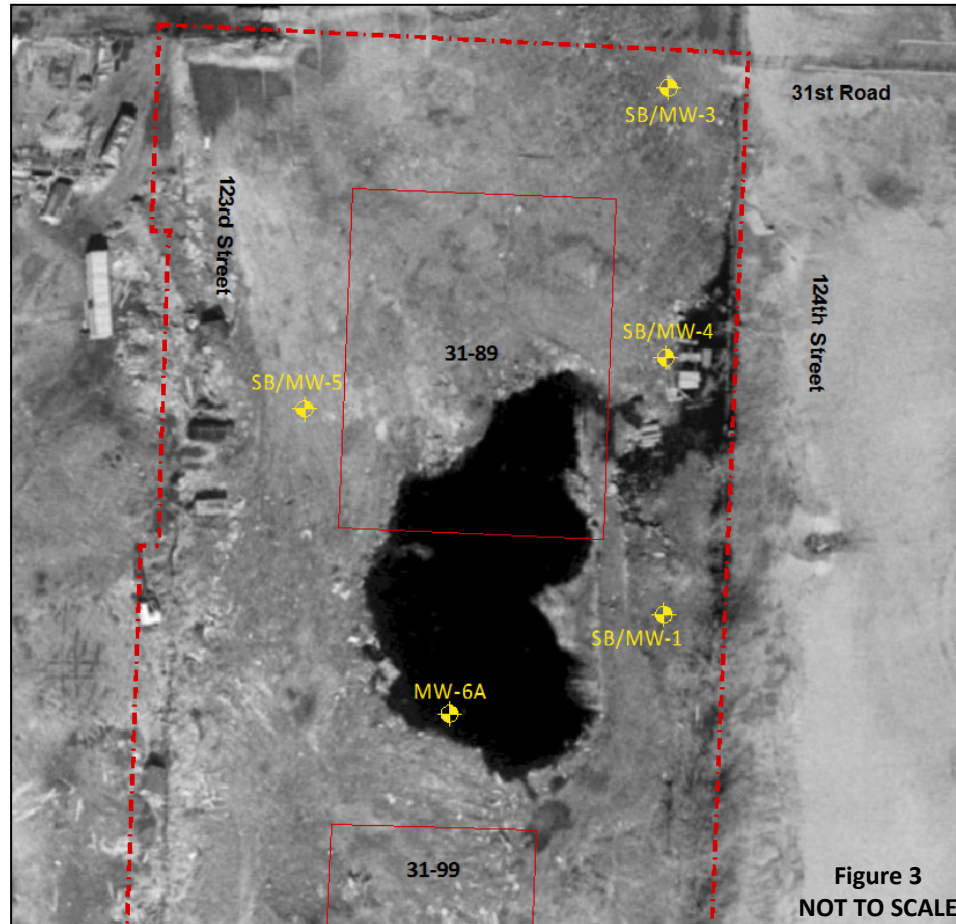
#### 1.2.6 SUBSURFACE INVESTIGATIONS (2002-2004)

A Phase II Environmental Site Assessment conducted by Gannett Fleming Engineers and Architects, P.C. during 2002 reported exceedances of petroleum contaminants in the subsurface soils and groundwater. Upon receipt of the investigation data the NYSDEC issued spill #02-09385. Galli Engineering, P.C., on behalf of the property owner, conducted a subsurface investigation which was reported to the NYSDEC during June 2003 with a closure request; the NYSDEC requested additional site work.

ECC, on behalf of the property owner, conducted additional site characterization during October/December 2003 that included monitoring well (MW) installation and soil and groundwater sampling. A site map of the approximate former soil boring/MW locations is included as Appendix A-2<sup>4</sup>.

<sup>4</sup>Boring/well logs and a site map of the well locations were not included in the copy of the ECC 2004 IR. Well location and identification obtained from the CRA June 7, 2005 Letter.

Continuous soil samples were collected from a total of four soil boring (SB) locations from grade to the end of the boring (end of boring depth ranges from 25 to 35-feet bg). Fill debris was observed to approximately 10-feet bg and sediment typical of tidal marsh deposits were encountered to approximately 17-feet bg. Field screened PID readings of soil samples collected were reported as non-detect. "A layer of oil supersaturated substrate" was observed at MW-1, MW-3 and MW-4 in vadose sediments. Soil collected from 15 to 17 ft bg at MW1, 3 and 4 "contained viscous oil in the pore space". The following 1980 orthoimage has been geospatially fixed to the site map (Appendix A-6) and includes approximate former SB/MWs locations (MW-6A was installed at a later date), current streets names, approximate location of the property boundary (dashed in red) and the approximate location of the buildings (outlined in solid red):



A scaled, 1980 orthoimage, geospatially fixed to the current site map has been included as Appendix A-6.

MW's were installed at the four reported SB locations (refusal was met upon drilling at SB-2; no data or reference to boring location was documented). Depth to groundwater was encountered between 21 and 26-feet bg. Groundwater samples collected from the MW's during October 2013 were filtered before collection for laboratory analysis. A two to three-inch layer of floating black oil Light Non-Aqueous Phase Liquid (LNAPL) was found in MW-3. A laboratory analyzed sample of the LNAPL detected Aroclor 1260 at 14,300 (assumed ppb) and total petroleum hydrocarbon of 607,000 ppm for mixed oils.

Conestoga-Rovers & Associated (CRA), on behalf of the property owner, continued investigation activities beginning in December 2004. CRA installed MW-6A during April 2005 and conducted two quarters of groundwater sampling during January and April 2005. NYSDEC Petroleum Spill # 08-09385 was subsequently closed on June 23, 2005.



### ***Summary of Soil Analysis from the Phase II Site Assessments***

Of all the laboratory analyzed soil collected during the 2003 and 2005 Phase II Site Assessments, MW-3 at 15-17 feet bg showed the most apparent chemicals of concern (COC) impact. Reported characteristics are as follows:

- the highest concentrations of benzene, total BTEX (benzene + toluene + ethylbenzene + total xylenes) and total volatile organic compounds (VOCs) (4.7 ppm, 99,753 ppm and 321,957 ppm, respectively)
- overall the highest Semi VOC (SVOC) concentrations including exceedance of 6 NYCRR Part 375 Environmental Remediation Programs, December 2006, Industrial Clean-up Objectives for four SVOC analytes; benzo(a)anthracene, benzo(a)pyrene, Benzo(b)fluoranthene and Dibenzo(a,h)anthracene
- the highest Aroclor 1260 concentration on soil of 3.0 ppm
- 2-3 inches of PCB-contaminated LNAPL at a concentration of 14.3 ppm
- Oil saturated substrate observed in samples collected above the water table from MW-1, MW-3 and MW-4

### ***Summary of Groundwater Analysis from the Phase II Site Assessments***

At all four MWs sampled during 2003, concentrations of dissolved benzene exceeded TOGS 1.1.1 Class GA water quality standards and guidance values<sup>5</sup>; highest concentrations of benzene, total BTEX and total VOCs were reported as 474 ppb, 1,958 ppb and 3,381 ppb, respectively, at MW-4. The highest concentrations of total BTEX and total VOCs were reported as 59 ug/L and 652 ug/L at MW-4 during January 2005 and as 71 ug/L and 874 ug/L during April 2005.

Upon submittal of the groundwater data collected through June 2005, the NYSDEC closed spill number 02-09385. The monitoring wells associated with NYSDEC Spill #02-09385 were decommissioned on September 2005.

Field observations of subsurface conditions and analytical results of the 2003 and 2005 subsurface investigations and groundwater sampling are consistent with the 1976-1980 files provided by the NYSDEC and location of the Oil Lagoon identified in the 1980 orthoimage. The mass of media removed and the extents of the excavation during the Oil Lagoon Clean-up are not detailed in NYSDEC documentation provided. Environmental Assessment & Remediations (EAR) has prepared the following SIWP to assess the status of the 1980 recommended remedial action conducted at the Site.

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<sup>5</sup>NYSDEC Division of Water Technical & Operational Guidance Series 1.1.1 – Ambient Water Quality Standards and Guidance Values, Class GA (groundwater).

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## **2.0 HEALTH & SAFETY PLAN**

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All EAR personnel to be engaged on this project have completed the 40-hour OSHA HAZWOPER training and are current with the annual 8-hour refresher courses. All EAR field personnel receive training in basic First Aid and CPR. Onsite health & safety measures will be implemented according to both the site Health & Safety Plan (HASP) and EAR's corporate HASP. The site HASP has been included as Appendix B.

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### **3.0 SOIL & GROUNDWATER INVESTIGATION PLAN**

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As requested by the NYSDEC, EAR has developed a SIWP for soil and groundwater investigation of VOCs, SVOCs, PCBs, Pesticides and Perfluorinated Compounds (PFC)/Perfluoroalkyl Substances (PFAS) in accordance with DER-10, section 3.3(b) for NYSDEC review and approval. The SIWP will include monitoring well installation after soil sample collection at selected locations. As part of the work plan, as directed by the NYSDEC, soil vapor near the onsite buildings will be evaluated for VOCs.

#### **3.1 DRILLING PREPARATION**

Following NYSDEC approval of the proposed SIWP, a subcontractor will be retained to locate and mark any subsurface utilities or structures using both conductive and non-conductive methodologies. The drilling contractor will obtain water and sewer maps from the New York City Department of Environmental Protection. NY811 will be notified of the work several days in advance of the drilling activities so that utilities can be located and marked. EAR shall meet onsite with utility locating contractor and drilling contractor to review the proposed boring locations, validate markouts and determine alternate proposed boring locations, as necessary. A site map of the proposed drilling locations is provided as Appendix A-7. Appendix A-6 is a 1980 orthoimage site map of the proposed boring locations in relation to the former College Point Oil Lagoon.

#### **3.2 GENERAL PROCEDURE OF DRILLING ACTIVITIES**

All drilling locations will be pre-cleared to 5-feet bg. During drilling activities, work zone air monitoring will be conducted as outlined in EAR's HASP.

##### *3.2.1 OVERSIGHT*

Drilling activities will be overseen by an EAR geologist. The geologist will be responsible for ensuring adherence to the work plan specifications, classifying soils as per NYSDEC Division of Environmental Remediation (DER)-10 Section 3.5.1(c) and field screening soil samples. The geologist will generate drill logs documenting the field data recorded during the subsurface investigation.

##### *3.2.2 EQUIPMENT DECONTAMINATION*

Down-hole tooling shall be decontaminated between each sample collected. Decontamination will consist of mechanical dirt removal, followed by a Liquinox™/water wash and potable water rinse.

##### *3.2.3 WASTE DISPOSAL*

Drill cuttings, rinse water, purged groundwater and investigation derived waste (IDW) will be containerized in USDOT approved 55-gallon drums and properly labeled. Waste handling/disposal procedures are detailed in Section 6.0.

#### **3.3 SOIL SAMPLING**

A total of 20 temporary boring locations have been proposed to investigate the subsurface conditions associated with NYSDEC Site #241001. At ten of the temporary boring locations, prior to subsurface soil sample collection, surface soil samples will be collected from beneath the surface pavement using a stainless-steel hand shovel. Continuous subsurface soil samples (soil cores) will be collected at all proposed boring locations via sonic drilling

methods. Upon collection, surface soil samples and soil cores will be logged for lithology. The terminating depth of each sample boring will be determined in the field such that the impact to soil is vertically delineated (via olfactory field observations; staining, odor, elevated Photo-Ionization Detector (PID) or oily appearance) and native sediments are encountered. Native sediments are expected to be typical of tidal marsh deposits. Temporary boring locations will be identified using a predetermined, sequential naming convention beginning with soil boring (SB)-01.

Soil cores will be composited for every 2-feet of advancement. Surface and soil core samples will be screened for volatile organic compounds (VOCs) with a PID by an on-site geologist. Zones of visual or olfactory identified impacted sediment will be isolated prior to consolidation and screened separately. Prior to each use, the PID will be calibrated using a 100 ppm isobutylene standard and ambient air.

Surface soils samples, the soil sample collected from the water table interface and the depth interval exhibiting the highest PID reading or impact determined by visual inspection will be collected for laboratory analysis. Should no impact be identified by PID or olfactory inspection, only the sample at the water table interface will be submitted for laboratory analysis. Submittal of additional soil samples will be determined as needed.

Soil samples will be collected in laboratory-provided soil jars and placed in a cooler with ice to maintain a temperature of 4-degrees Celsius. Soil samples will be submitted to an NYSDEC standby contracted laboratory (TestAmerica, Inc. (TA)) for analysis of Target Compound List (TCL) for VOCs via EPA Method 8260, TCL for SVOCs via EPA Method 8270, PCBs via EPA Method 8082A, TAL<sup>6</sup> metals by EPA Method 6010C and mercury by EPA Method 7471B. 25% of the total number of samples will also be submitted to TA for analysis of TCL for Pesticides via EPA Method 8081B. All samples will be submitted for a 10-day turnaround time with Analytical Services Protocol (ASP) Category B deliverables requested. A proposed sampling plan detailing locations to be sampled and QA/QC sampling requirements is provided as Table 1.

Following receipt and review of all ASP Category B deliverable packages, EAR will submit the electronic copies of the analytical results (reports and Electronic Data Deliverables (EDD)) from Test America to a qualified subcontractor for review and preparation of a data usability summary reports (DUSR) as well as EDD validation.

### **3.4 MONITORING WELL CONSTRUCTION**

Based on observations of subsurface conditions and field screening of soil collected, a single-cased monitoring well will be installed at up to a total of 10 temporary boring locations. Wells will be constructed of 2-inch diameter, schedule 40 PVC casings with 2-inch diameter, schedule 40 PVC, 0.010 inch slot screens. According to historical records, depth to groundwater is anticipated to be encountered at approximately 22 feet bg. The top of the screened section will be set approximately 5-feet above the water table interface (such that the solid PVC casing will be approximately 17-feet in length). The total length of screen section will be determined in the field based on the vertical profile of the soil boring defined during investigative activities and upon NYSDEC approval.

Filter sand pack will be installed around the screened zone from the end of the boring to approximately 1-foot above the well screen. A 1-foot bentonite seal will be installed above the well screen. The borehole will be grouted to approximately 1-foot bg. The well will be finished at grade with an 8-inch diameter, steel, bolt-down manhole set into a saw cut 2-foot by 2-foot concrete pad. A two-inch locking well cap will be installed at the top the sampling

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<sup>6</sup>TAL metals list includes: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc

point. Monitoring wells will be identified using a predetermined, sequential naming convention beginning with monitoring well (MW) DEC-01. A proposed monitoring well construction schematic is provided as Appendix A-8.

### **3.5 WELL DEVELOPMENT**

Following the completion of the well installation, EAR will develop each monitoring well by surge blocking and purging with a Stainless Steel Monsoon pump. Purged water will be monitored in the field for turbidity using a handheld nephelometer (Hach 2100Q or equivalent) and continue until turbidity stabilizes at or below 50 NTU's for three consecutive readings. If the turbidity stabilizes to 50 NTU's before reaching the target volume, purging will continue; the target well development volume will be determined by the volume of water used during well installation and the volume of standing water in the well.

### **3.6 SOIL VAPOR MONITORING POINT INSTALLATION**

A total of six VMPs will be installed in accordance with New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006. At each location, drive rods will be advanced via direct push drilling methods to a total depth of 8-feet bg to deploy a 6-inch section of 3/8-inch diameter stainless steel braided screen (Geoprobe soil vapor implant or similar) attached to approximately 8.5-feet of 1/4-inch diameter Teflon (inert) tubing. An inert filter pack (#80-120 mesh glass beads or crushed stone) will be installed to approximately 1.5-feet above the screened section followed by a 3-foot hydrated bentonite seal. The remaining annulus will be filled with a #1 gravel pack to approximately 1.5-feet bg and finished with a hydrated bentonite seal installed up and inside the manhole providing a seal to the surface. VMPs will be finished with a 4-inch flush to grade bolt-down manhole cover.

VMPs will be identified using a predetermined, sequential naming convention beginning with VMP-1. Proposed VMP locations are included on Appendix A-7.

### **3.7 SURFACE RESTORATION DURING INVESTIGATION**

Immediately following sampling of the temporary borings for locations without subsequent well installation, the boring will be backfilled with clean native fill or well gravel. At the surface, the borehole will be finished to match the surrounding pavement (i.e. asphalt patch for borings in macadam). The monitoring wells will be decommissioned at a later date, determined by the NYSDEC, in accordance with NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy/Methods for Grouting-In Place.

### **3.8 SURVEY**

Following surface restoration, a site survey will be conducted by an EAR survey team. Monitoring wells, temporary sampling locations, property boundaries, buildings and other improvements will be surveyed for geospatial location (x,y). The manhole cover and individual casing elevations for each discrete sampling point will be included in the survey data collection of the monitoring wells. Casing elevations will be determined to the nearest 0.010 foot. The coordinates will be obtained from orthoimagery with the NAD 83, State Plane, NY, Long Island (LISP) projection (feet). Site maps will be geospatially referenced to NAD 83, LISP. Location data derived from the survey activities will be incorporated into EQUS format location EDD and submitted to NYENVDATA along with the correspondence laboratory EDD packages.

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## 4.0 GROUNDWATER SAMPLING OF MONITORING WELLS

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### 4.1 MONITORING WELL SAMPLING

Following well installation and development, groundwater samples will be collected from the 10 proposed MWs. Prior to sample collection, depth-to-water and total well depths shall be gauged to the nearest 0.01 foot using an electronic interface probe and recorded. Groundwater will be purged/sampled utilizing peristaltic and/or submersible pumps and HDPE tubing. A new length of HDPE tubing shall be utilized at each well. All non-dedicated sampling tools shall be decontaminated between each sample location using a Liquinox/water wash following by distilled water rinse.

Each monitoring well will be purged of at least one standing well volume then screened for pH, temperature, and conductivity using a handheld water quality meter (YSI 556 or equivalent) until stabilization is reached. Dissolved oxygen concentrations, and oxidation reduction potential will be recorded as well. Once stabilization of the above water quality parameters has been achieved, samples will be collected in appropriate laboratory-provided sample containers and placed in a cooler with ice to maintain a temperature of 4-degrees Celsius.

A total of 10 groundwater samples and one blind duplicate will be submitted to an NYSDEC standby contracted laboratory (Test America, Inc.) for analysis of VOCs via EPA Method 8260, SVOCs via EPA Method 8270, PCBs via EPA Method 8082A, Pesticides via EPA Method 8081B, TAL<sup>7</sup> metals by EPA Method 6020A, mercury by EPA Method 7470A, TPH-DRO via EPA Method 8015D, PFC/PFAS for standard list of 21 compounds via EPA Method 537 and chloride by method 300.0. Samples will be submitted for a 10-day turnaround time) with ASP Category B deliverables requested. A proposed sampling plan, which details locations to be sampled and QA/QC sampling requirements, is provided as Table 2. Following receipt and review of all ASP Category B deliverable packages, EAR will submit the electronic copies of the analytical results (reports and EDD's) from Test America to a qualified subcontractor for review and preparation of a DUSR and EDD validation.

Rinse water, purge water and IDW will be containerized in USDOT approved 55-gallon drums and properly labeled. Waste handling/disposal procedures are detailed in Section 6.0.

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## 5.0 VAPOR MONITORING POINT SAMPLING

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Following groundwater sample collection, soil vapor samples will be collected from each VMP in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

### 5.1 VAPOR MONITORING POINT SAMPLING

Prior to sampling, a tracer gas test chamber will be constructed at grade above the VMP. The chamber will be constructed of HDPE food-grade plastic and fitted with two HDPE valves (for introduction and measurement of the tracer gas) and a pass-through port (to allow the sample tubing to exit the helium-enriched test chamber). The chamber will be constructed over the borehole, on a flat, level surface. Non-VOC emitting modeling clay will then be used to seal the test chamber and all entry/exit points installed on the chamber's container to ensure it is air-tight. See Appendix A-9 for proposed VMP construction.

To test the integrity of the seal, the test chamber will be enriched with Grade 5 Helium (99.999% Helium) to a minimum concentration of 80%, measured by a multi-gas detector. With the inlet and exhaust valves closed and a final check of the test chamber seal will be performed prior to purging the sample point 1-3 tube volumes. The sample tube will be purged with a vacuum pump calibrated to a flow rate of 0.2 L/min or less. Field screening equipment including the PID and Helium Detector will be periodically tested using a Defender 510 Primary Flow Calibrator to ensure the draw of the equipment pumps do not exceed 0.2 L/min. The sample tube will be screened with a PID before and after purging (before sample collection).

The SUMMA canister will be connected to the sample tubing to commence air sample collection using laboratory-provided 6-liter SUMMA canisters and laboratory-calibrated flow regulators set to a sampling duration of 30 minutes. Once the sample collection time has elapsed, the SUMMA canister valve will be closed and the sample tubing will be disconnected from the SUMMA canister. A final PID reading will then be recorded from the sample tubing and the final test chamber helium concentration will be recorded.

### 5.2 AMBIENT AIR SAMPLING

In addition to VMP sampling, one outdoor ambient air sample will be collected from a location to be determined in the field based onsite conditions and proximity to potential contaminant sources. The sample will be collected using laboratory-provided 6-liter SUMMA canisters and laboratory-calibrated flow regulators set to a sampling duration of 30 minutes. The SUMMA canister will be positioned approximately 3 to 5-feet above grade in an open area, away from wind obstructions (i.e. trees, bushes, buildings, etc) as practical. Once set up, an ambient air PID reading will be recorded and air sampling will commence by opening the flow regulator control valve completely for the entire sample duration.

### 5.3 SAMPLE INVENTORY AND LABORATORY ANALYSIS

Summa canister/mass flow controller serial numbers, sample start/stop times, and vacuum readings will be recorded on provided Summa Canister Sample Log Sheets and field notes. A total of seven air samples and one blind duplicate will be submitted to an NYSDEC standby contracted laboratory (Test America, Inc.) for analysis of VOCs via EPA Method TO-15 analysis for a standard turnaround time with ASP Category B deliverables requested. A proposed sampling plan, which details locations to be sampled and QA/QC sampling requirements, is provided as Table 3. To collect the blind duplicate samples, the tubing will be split with a tee. A SUMMA canister will then be connected to each end of the tee.

Following receipt and review of all ASP Category B deliverable packages, EAR will submit the electronic copies of the analytical results (reports and EDD's) from Test America to a qualified subcontractor for review and creation of DUSR as well as EDD validation.



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## 6.0 WASTE TRANSPORTATION & DISPOSAL

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Transportation for wastes identified for disposal will be arranged with a NYSDEC Region 2 Response Contractor (Island Pump & Tank (IPT), East Northport, NY). A copy of IPT's NYSDEC Part 364 Waste Transporter permit is provided as Appendix C.

A minimum of two composite soil samples and one groundwater sample will be collected at the onset of the subsurface investigation for analysis of a waste characterization profile. The two composite soil samples will represent anticipated high and low concentration samples. Soil and groundwater samples will be submitted to an NYSDEC standby contracted laboratory (Test America, Inc.) for expedited turnaround of flashpoint by EPA Method 1010A, benzene by TCLP analysis and PCBs by EPA Method 8082. Soil samples will also be submitted for RCRA metals by TCLP analysis.

Drums will be temporarily stored at the site and picked up weekly, pending the receipt of the waste characterization profile. The drum staging area will be secured with chained and locked, temporary construction fencing. The location of the drum storage area will be negotiated with the property owner. At the time of pickup, IPT shall provide a manifest that provides the following information:

- Contact information
- Vehicle license number
- Destination
- Description & quantity of materials

All drum pickups will be via a closed box-truck or similar closed/covered vehicle. All drums will be sealed and secured. Drums will be loaded onto transport vehicles using either a lift-gate or winch operated lift.

The designated disposal facility shall hold valid permits applicable to the handling, storage, and disposal/treatment of wastes. Disposal facility permits shall be submitted to NYSDEC upon selection of designated disposal facility.

---

## 7.0 INVESTIGATION REPORT

---

A summary report of all site related activities will be prepared following the completion of the work outlined in this plan. The report will include:

- Written details of the field activities
- Boring logs, well construction logs, development logs and purge logs
- Tabulated analytical results with a comparison to applicable standards, criteria and guidance values
- A site figure generated from survey data
- Concentration spider maps for each media and stratigraphic cross sections
- DUSRs and validated EDD packages
- Validated EDD's will be submitted by EAR to NYSDEC database administration for import

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**TABLES**

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**TABLE 1 – PROPOSED SOIL SAMPLING PLAN**

**TABLE 2 – PROPOSED GROUNDWATER SAMPLING PLAN**

**TABLE 3 – PROPOSED VAPOR MONITORING POINT SAMPLING PLAN**

Table 1

College Point Oil Lagoon  
31-89 and 31-99 123rd Avenue  
College Point, NY  
NYSDEC Site# 241001



### Proposed Soil Sampling Plan

Sample Location	Anticipated Total Boring Depth (feet bg)	TCL VOCs by EPA Method 8260	TCL SVOCs by EPA Method 8270D	PCBs by EPA Method 8082A	TCL Pesticides by EPA Method 8081B	Metals by EPA Method 6010C	Mercury by EPA Method 7471B
		2-2 oz glass for 8260 and 1-8 oz glass for 8270, 8082A, 8081B, 6010C and 7471B					
SB/DEC-1	30	x	x	x	x	x	x
SB/DEC-2	30	x	x	x		x	x
SB/DEC-3	30	x	x	x		x	x
SB/DEC-4	30	x	x	x		x	x
SB/DEC-5	30	x	x	x	x	x	x
SB/DEC-6	30	x	x	x		x	x
SB/DEC-7	30	x	x	x		x	x
SB/DEC-8	30	x	x	x		x	x
SB/DEC-9	30	x	x	x		x	x
SB/DEC-10	30	x	x	x	x	x	x
SB-11	30	x	x	x		x	x
SB-12	30	x	x	x		x	x
SB-13	30	x	x	x		x	x
SB-14	30	x	x	x		x	x
SB-15	30	x	x	x	x	x	x
SB-16	30	x	x	x		x	x
SB-17	30	x	x	x		x	x
SB-18	30	x	x	x		x	x
SB-19	30	x	x	x		x	x
SB-20	30	x	x	x	x	x	x

% of samples retained for lab analysis that will be submitted per method:

100                      100                      100                      25                      100                      100

#### Notes:

Lab analysis will be conducted by Test America.

TCL - Target Compound List

Sample containers provided by the laboratory.

Composite soil samples will also be submitted to Test America, Inc. for expedited turnaround of flashpoint by EPA Method 1010A, benzene by TCLP analysis, PCBs by EPA Method 8082 and RCRA metals by TCLP analysis for waste characterization.

Surface soils samples, the soil sample collected from the water table interface and the depth interval exhibiting the highest PID reading or impact determined by visual inspection will be collected for laboratory analysis. Should no impact be identified by PID, visual or olfactory inspection, only the sample at the water table interface will be submitted for laboratory analysis. Submittal of additional soil samples will be determined as needed.

Table 2

College Point Oil Lagoon  
 31-89 and 31-99 123rd Avenue  
 College Point, NY  
 NYSDEC Site# 241001



**Proposed Groundwater Sampling Plan**

Sample Location	Total Well Depth (feet bg)	Diameter (inch)	Field Screening Stabilization Purge	TCL VOCs by EPA Method 8260C			TCL SVOCs by EPA Method 8270D			TPH DRO by EPA Method 8015D			TCL Pesticides by EPA Method 8081B			PCBs by EPA Method 8082A			Metals by EPA Method 6010C and Mercury by EPA Method 7471B			Chloride by EPA Method 300.0			PFC/PFAS (21 Analytes) by Modified EPA Method 537			Equipment Blanks*			
				3 - 40mL VOAs w/HCl			2 - 250 mL unpreserved Amber Glass			2 - 250 mL unpreserved Amber Glass			2 - 250 mL unpreserved Amber Glass			2 - 250 mL unpreserved Amber Glass			1 - 250 mL Plastic w/Nitric Acid			1 - 125 mL unpreserved Plastic			2 - 250 mL unpreserved Plastic						
				S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD	S	Blind Dup	MS/MSD		S	Blind Dup	MS/MSD
DEC-1	27	2	x	x			x			x			x			x			x			x			x			x			x
DEC-2	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-3	27	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
DEC-4	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-5	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-6	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-7	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-8	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-9	27	2	x	x			x			x			x			x			x			x			x			x			
DEC-10	27	2	x	x			x			x			x			x			x			x			x			x			

totals: 10 10 1 1 10 1 1 10 1 1 10 1 1 10 1 1 10 1 1 10 1 1 10 1 1 10 1 1 1

Notes:

Lab analysis will be conducted by Test America.

TCL - Target Compound List

Dup - Duplicate (duplicate samples will be collected at a rate of 1:10)

S - Sample

Sample containers provided by the laboratory.

1 field blank at a rate of 1:20 will be submitted to Test America for all methods using lab provided/certified DI water.

1 trip blank (prepared by the laboratory) per cooler will be submitted for EPA Method 8260C analysis for TCL of VOCs.

\*2 equipment blanks at a rate of 1:20 will be submitted to Test America for EPA Method PFC Modified Method 537; 1 rinsate from the WLM and 1 the HDPE tubing & foot valve assembly using lab provided/certified DI water.

Field Screening will include DO, ORP, pH, Temperature and Specific Conductivity.

Table 3

College Point Oil Lagoon  
 31-89 and 31-99 123rd Avenue  
 College Point, NY  
 NYSDEC Site# 241001



**Proposed Vapor Monitoring Point (VMP) Sampling Plan**

Sample Location	Total VMP Depth (feet bg)	EPA TO-15 (6L SUMMA Canister with a 0.2 L/min regulator)	Duplicate
VMP-1	8	1	1
VMP-2	8	1	
VMP-3	8	1	
VMP-4	8	1	
VMP-5	8	1	
VMP-6	8	1	
Ambient Air	na	1	

total 7 1

Notes:

Lab analysis will be conducted by Test America.

Sample containers provided by the laboratory.

Duplicate samples will be collected at a rate of 1:10

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## APPENDIX A - FIGURES

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**APPENDIX A-1 – SITE LOCATION MAP IDENTIFYING BODIES OF WATER**

**APPENDIX A-2 – SITE MAP WITH MAJOR SITE FEATURES AND FORMER MW/SBS**

**APPENDIX A-3 – USGS TOPOGRAPHIC MAP, FLUSHING, NY, 1897**

**APPENDIX A-4 – USGS TOPOGRAPHIC MAP, FLUSHING, NY, 1947**

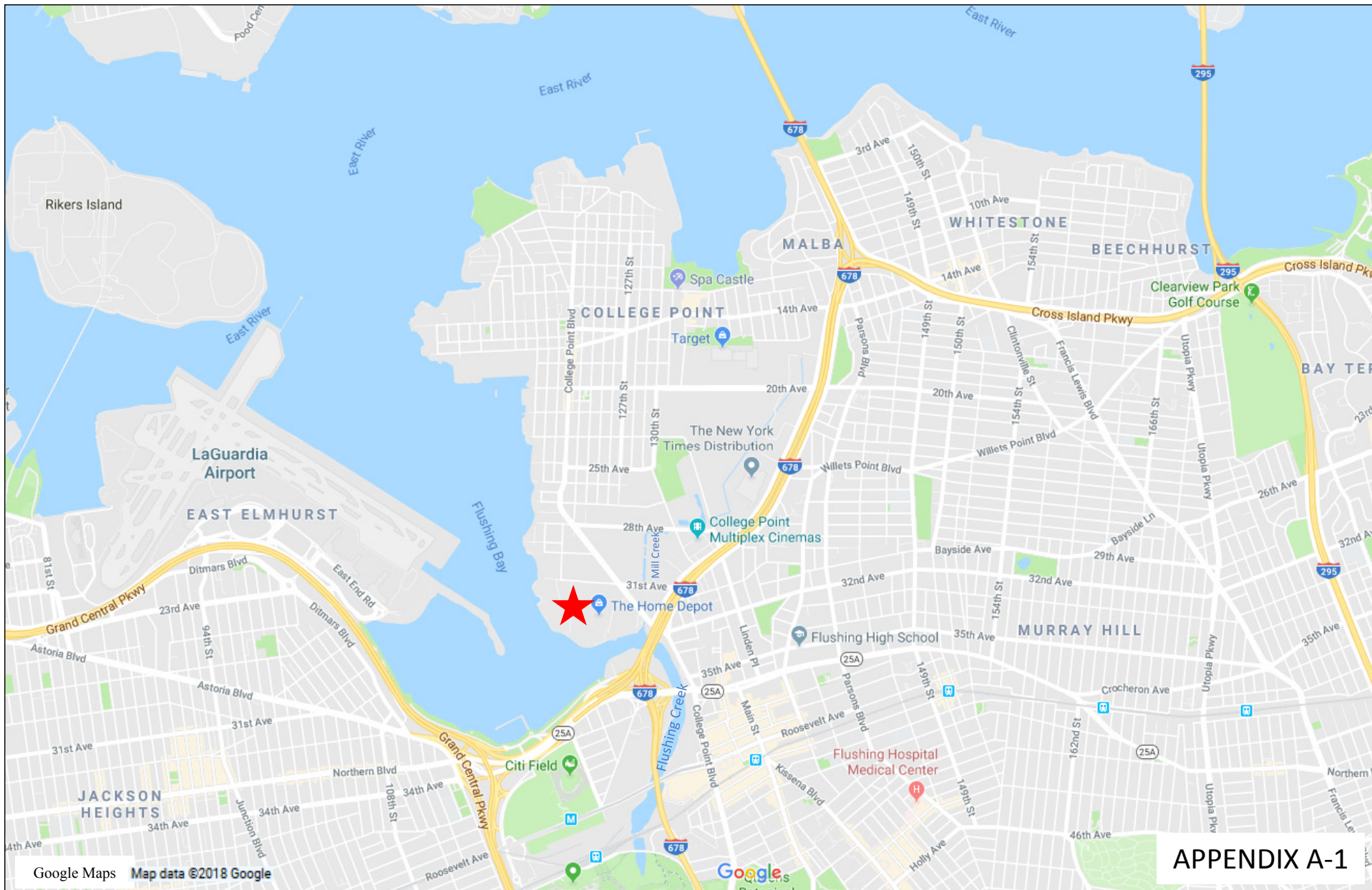
**APPENDIX A-5 – USGS TOPOGRAPHIC MAP, FLUSHING, NY, 1955**

**APPENDIX A-6 – 1980 ORTHOIMAGE SITE MAP WITH PROPOSED DRILLING LOCATIONS**

**APPENDIX A-7 – SITE MAP WITH PROPOSED DRILLING LOCATIONS**

**APPENDIX A-8 – PROPOSED MONITORING WELL CONSTRUCTION**

**APPENDIX A-9 – PROPOSED VMP CONSTRUCTION & SOIL GAS SAMPLING SCHEMATIC**



APPENDIX A-1



ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS

## SITE LOCATION MAP



College Point Oil Lagoon  
123<sup>rd</sup> Street & 31<sup>st</sup> Avenue  
College Point, NY  
NYSDEC Site# 241001





APPENDIX A-2

**Legend**

-  2004/2005 Monitoring Well
-  Estimated Property Line

0 60  
SCALE IN FEET



ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS

# Site Map

College Point Oil Lagoon  
123rd Street and 31st Avenue  
College Point, NY  
NYSDEC Site #241001



APPENDIX A-3



ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS

USGS TOPOGRAPHIC MAP  
FLUSHING, NY  
1897

College Point Oil Lagoon  
123<sup>rd</sup> Street & 31<sup>st</sup> Avenue  
College Point, NY  
NYSDEC Site# 241001



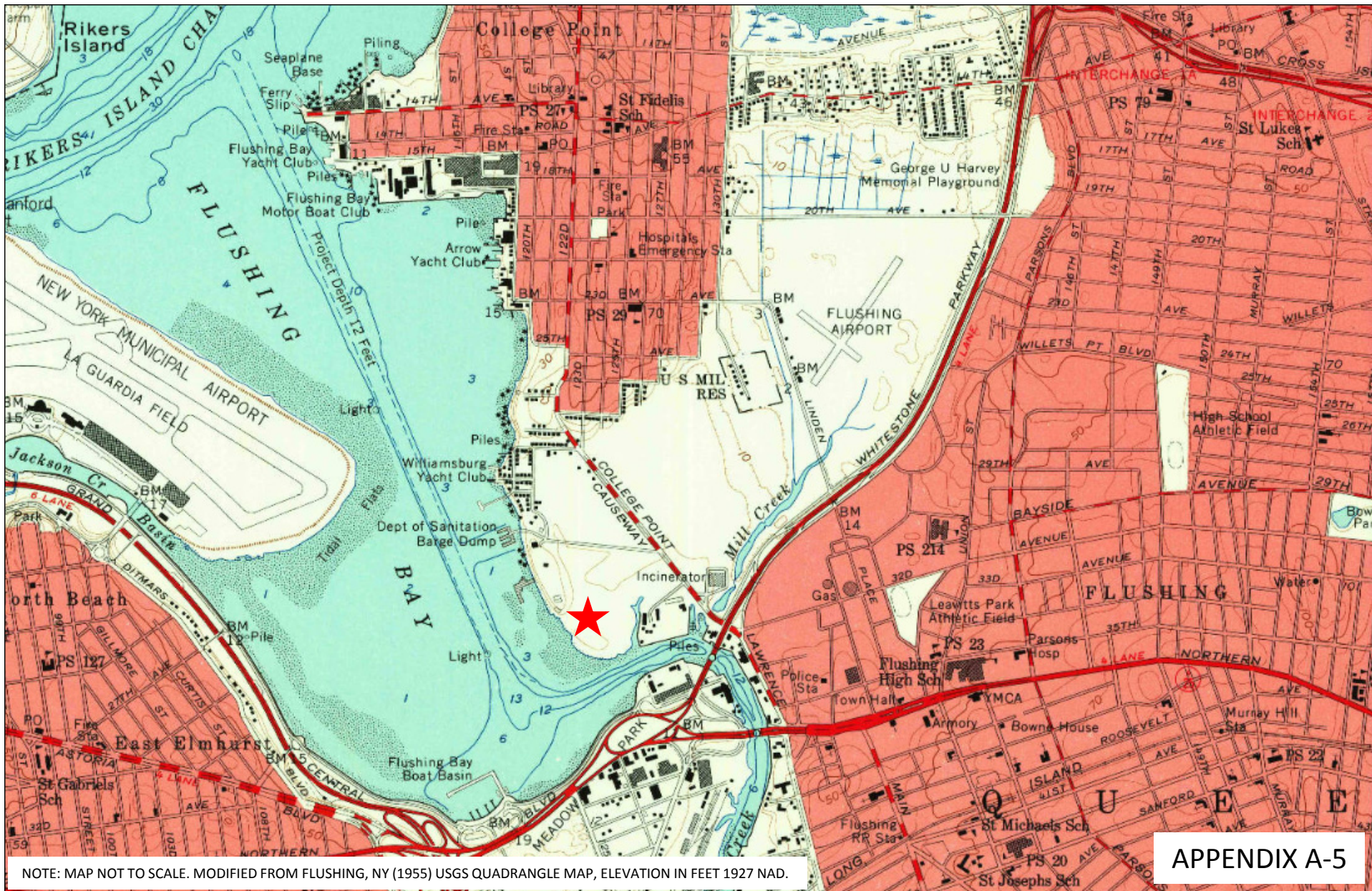
APPENDIX A-4



ENVIRONMENTAL  
ASSESSMENT &  
REMIEDIATIONS

USGS TOPOGRAPHIC MAP  
FLUSHING, NY  
1947

College Point Oil Lagoon  
123<sup>rd</sup> Street & 31<sup>st</sup> Avenue  
College Point, NY  
NYSDEC Site# 241001



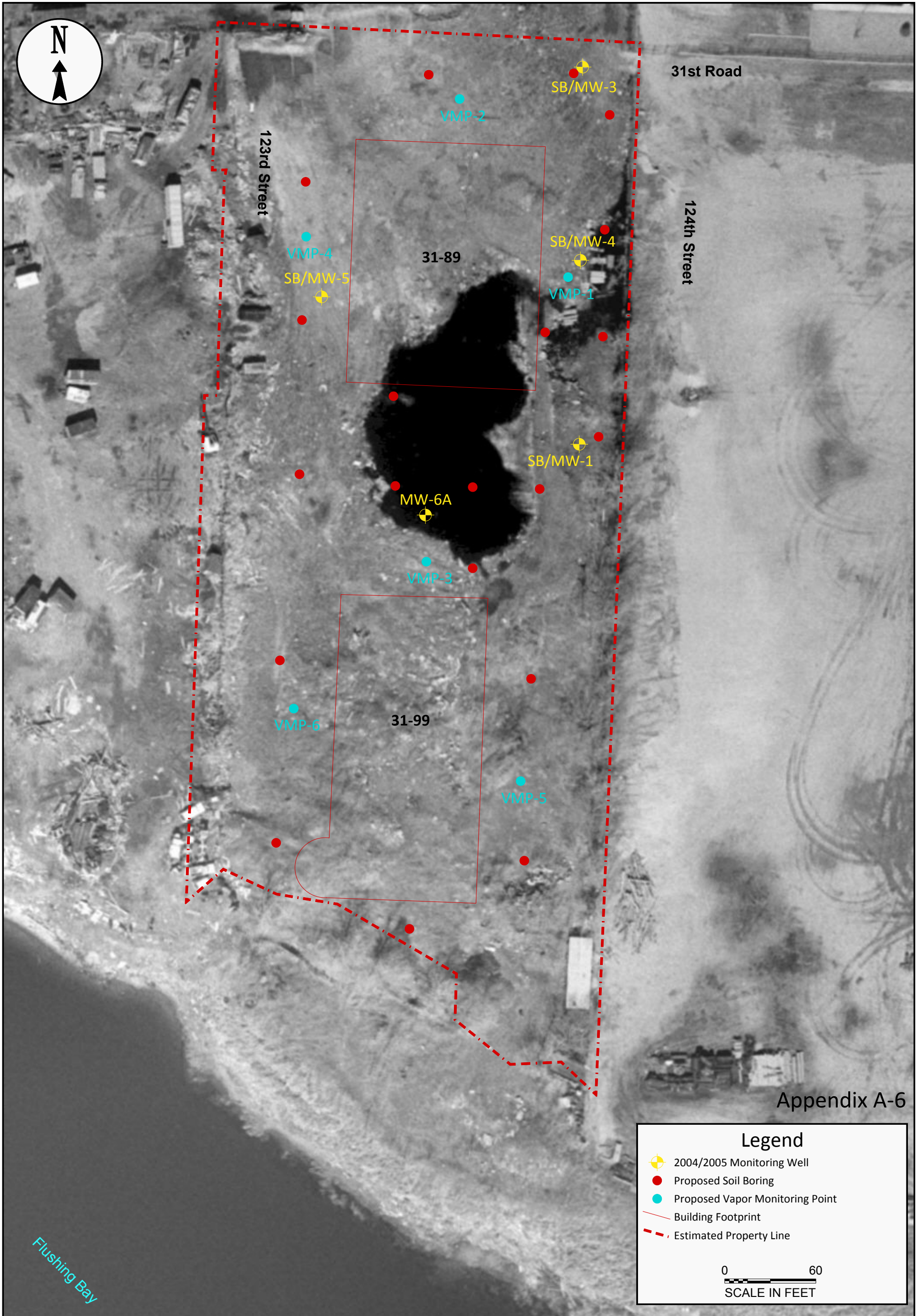
NOTE: MAP NOT TO SCALE. MODIFIED FROM FLUSHING, NY (1955) USGS QUADRANGLE MAP, ELEVATION IN FEET 1927 NAD.



ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS

USGS TOPOGRAPHIC MAP  
FLUSHING, NY  
1955

College Point Oil Lagoon  
123<sup>rd</sup> Street & 31<sup>st</sup> Avenue  
College Point, NY  
NYSDEC Site# 241001



Appendix A-6



ENVIRONMENTAL  
ASSESSMENT &  
REMIEDIATIONS

1980 Orthoimage  
Site Map with  
Proposed Drilling Locations

College Point Oil Lagoon  
123rd Street and 31st Avenue  
College Point, NY  
NYSDEC Site #241001



Appendix A-7

**Legend**

- 2004/2005 Monitoring Well
- Proposed Soil Boring
- Proposed Vapor Monitoring Point
- Building Footprint
- Estimated Property Line

0 60  
SCALE IN FEET

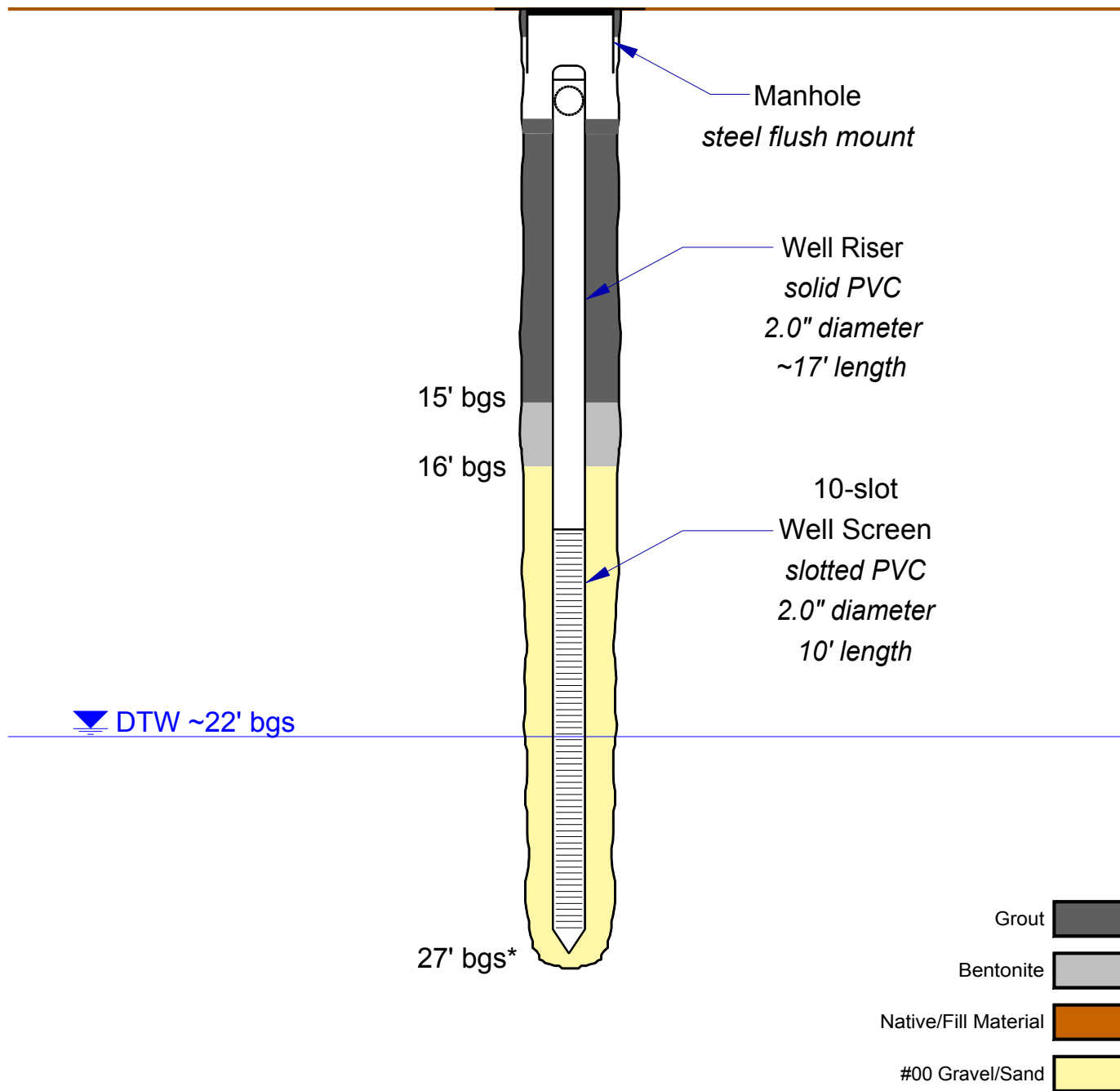


ENVIRONMENTAL  
ASSESSMENT &  
REMIEDIATIONS

Site Map with  
Proposed Drilling Locations

College Point Oil Lagoon  
123rd Street and 31st Avenue  
College Point, NY  
NYSDEC Site #241001

# Single Cased Well



\*The total length of screen section will be determined in the field based on the vertical profile of the soil boring defined during investigative activities and upon NYSDEC approval.

NOT TO SCALE

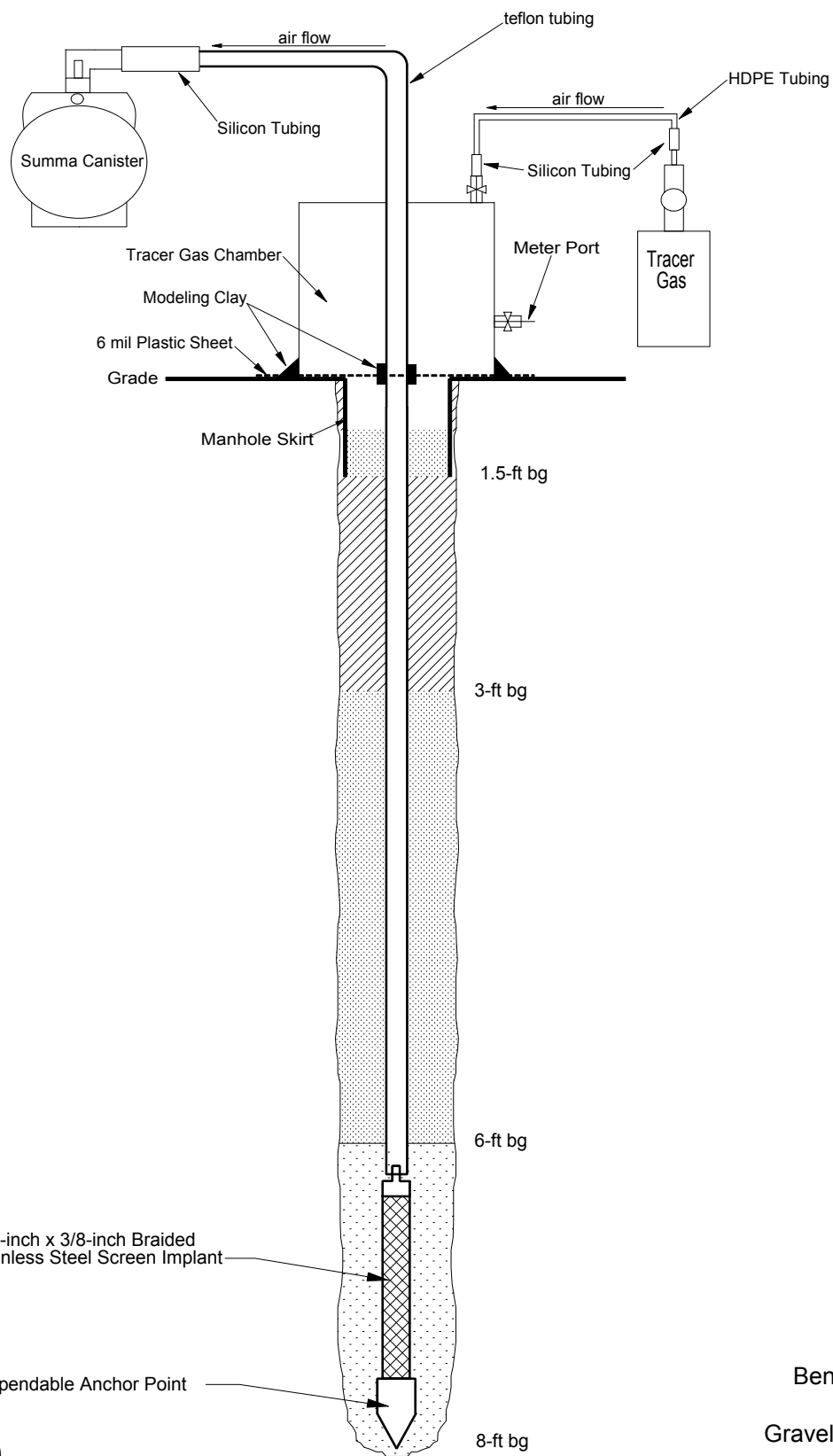
APPENDIX A-8



ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS

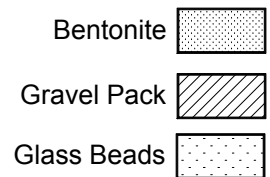
Proposed Well Design

College Point Oil Lagoon  
College Point, New York  
NYSDEC Site ID 241001



## APPENDIX A-9

NOT TO SCALE



ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS

Vapor Monitoring Point  
Construction & Soil-Gas  
Sampling Schematic

College Point Oil Lagoon  
College Point, New York  
NYSDEC Site ID 241001



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**APPENDIX B - SITE HEALTH & SAFETY PLAN**

---

## HEALTH & SAFETY PLAN

COLLEGE POINT OIL LAGOON  
123<sup>RD</sup> STREET AND 31<sup>ST</sup> AVENUE  
COLLEGE POINT, NEW YORK  
NYSDEC SITE# 241001

Prepared For:



Prepared By:



ENVIRONMENTAL  
ASSESSMENT &  
REMIEDIATIONS

Environmental Assessment & Remediations  
225 Atlantic Avenue  
Patchogue, NY 11772

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## 1.0 INTRODUCTION

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This document represents the Health & Safety Plan (HASP) for the well installation and sampling activities at the College Point Oil Lagoon site; New York State Department of Environmental Conservation (NYSDEC) Site No. 241001. It provides site specific procedures supplemental to Environmental Assessment & Remediations' (EAR) corporate HASP.

The area of investigation includes 31-89 123<sup>rd</sup> Street and 31-99 123<sup>rd</sup> Street, College Point, NY. A site location map is provided as Figure 1. A site plan is provided as Figure 2. The area is primarily zoned for industrial/commercial use with residential properties approximately 0.4 miles to the north. Environmental investigations have identified Polychlorinated biphenyl (PCB) oil and petroleum contaminants as the primary contaminants of concern.

The scope of work at this site during subsurface investigation activities will include:

- Soil sample collection from temporary soil boring locations.
- Installation of groundwater monitoring wells from select temporary soil boring locations and collection of groundwater samples.
- Installation and sample collection of soil vapor samples.
- Containerization, management, and coordination of transportation & disposal of investigation derived wastes.

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## 2.0 HEALTH & SAFETY ORGANIZATION

---

### 2.1 HEALTH & SAFETY OFFICER

The Health & Safety Officer (HSO) is responsible for EAR's compliance with all applicable federal, state, and local regulations pertaining to health & safety, development of EAR's health & safety policies, and periodic review of field activities to document adherence to health & safety protocol.

The HSO will also be responsible for implementing the medical program, initiating periodic safety meetings, and ensuring site personnel are properly trained (see section on *Special Education & Training*). The HSO maintains a knowledge of EAR's ongoing projects and works with the field foreman and supervisor to review project specific protocol and make necessary adjustments as site conditions change.

**Health & Safety Officer:**

John Hofmann (Contract Manager / Health & Safety Officer)

Work: **(631) 447-6400 ext. 113**

Home: **(631) 475-7206**

Cell: **(516) 924-1382**

### 2.2 SUPERVISOR/PROJECT MANAGER

The supervisor/project manager will be responsible for overseeing all site operations and assuring that all work is performed in a safe and timely manner. She/he will coordinate all activities with the client and make any necessary decisions based upon input from the HSO and client.

### 2.3 FIELD FOREMAN

It will be the responsibility of the field foreman to inspect the work area, corroborate with the project manager and HSO, and determine personnel protection levels before beginning work. The field foreman will also ensure that all EAR personnel in the work area are using all necessary personal protective equipment.

The field foreman and/or project manager will designate personnel who will monitor changing conditions in the work area such that protective measures can be adjusted accordingly. Conditions that should be monitored include, but are not limited to changes in weather, equipment conditions, and atmospheric conditions (contaminant and/or oxygen levels, etc.).

### 2.4 OTHER PERSONNEL

All onsite field staff are signatories to this Health & Safety Plan and are expected to conduct their activities in a manner consistent with the plan.

All personnel are encouraged to identify potentially hazardous conditions and promptly notify a field foreman of any such conditions.

### 2.5 CERTIFIED SAFETY PROFESSIONAL

EAR has retained the services of a certified safety professional to provide guidance in the development of health & safety protocol, as well as final review and approval of corporate and project-specific health & safety protocol.

**Certified Safety Professional:**

Jack Walsh, CSP; CHST

Cell: **(631) 774-7625**

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### 3.0 SPECIAL EDUCATION & TRAINING

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In order to help our employees perform their duties in a safe and efficient manner, EAR has developed a safety-training program. All field employees are trained to work safely with hazardous materials upon commencement of employment. Annual refresher courses and periodic training meetings supplement this training.

All field personnel engaged on this project will have the following training at a minimum:

- OSHA 40-Hour HAZWOPER Training (29 CFR/OSHA 1910.120)
- OSHA 8-Hour HAZWOPER Annual Refresher (29 CFR/OSHA 1910.120)
- First Aid (American Health Association or National Safety Council)
- CPR / AED (American Health Association or National Safety Council)
- Respirator fit testing & training
- Hands-on training in the maintenance, inspection, donning/doffing, usage, and limitations of the different types of personnel protective equipment which could be required in HAZWOPER operations.

#### 3.1 TAILGATE SAFETY MEETINGS

Prior to beginning any new jobsite activities, the HSO and/or designated field foreman will conduct an onsite tailgate safety meeting with all field personnel to review task hazards and safety procedures. A Job Safety Checklist and PPE Hazard Assessment Form (see Appendix A) will be completed and the applicable Job Hazard Analysis will be reviewed for each tailgate safety meeting and submitted to the project manager and HSO for review. Additional tailgate safety meetings will be held as jobsite conditions or proposed work plan activities change.

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#### 4.0 MEDICAL PROGRAM

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All project personnel will have adequate protection from exposures through engineering and administrative controls, appropriate personal protective equipment and project site control as described in this HASP. The medical program outlined here will be used to evaluate and monitor potential exposure to toxic and harmful substances above permissible levels, resulting in acute and/or chronic illness.

Basic medical contents of this project include:

- Medical Surveillance – All employees receive an OSHA compliant medical examination upon employment. The content and subsequent follow-up exam frequency shall be at the discretion of the professional health care provider (PHCP) selected by EAR. The PHCP examination shall include:
  - Non-DOT Physical Examination
  - Blood Work CBC, Chem, Lead
  - Chest X-Ray

Field employees engaged on this project are required to have annual physical examinations.

- Pulmonary Function Test (PFT) – The ability to don a respirator shall be determined by the PHCP. This examination shall be provided to all field personnel engaged on this project who will be or may be entering hazardous or transitional work zones. Follow-up exams would be at the discretion of the PHCP. **Note:** Employees who have been medically cleared to wear respiratory protection within the past (calendar) year, will not need to re-take the test for this project.
- Emergency Response – Emergency contacts, including the address and phone number to the local hospital are listed in Section 19.0. All company personnel are trained in CPR and first-aid response. Based upon the situation, the field foreman, or his/her designee, will notify the office of an incident and activate the emergency contact services so that professional assistance would be summoned immediately. It will be the responsibility of on-site company personnel to simply assist the injured by stabilizing and providing warmth until professional responders arrive. Additional information can be found in Sections 18.0 and 19.0.



## 5.0 HAZARD ASSESSMENT

EAR recognizes that engineering, work practice and administrative controls are the primary means of reducing employee exposure to occupational hazards. This section identifies the hazards associated with the proposed scope of work and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate exposure to hazards.

### 5.1 CHEMICAL HAZARDS

The primary routes of exposure to chemical hazards to onsite workers are through inhalation, ingestion and skin contact/adsorption. Safety Data Sheets (SDS) for known and suspected chemicals that may be encountered are included in Appendix B.

#### 5.1.1 SITE SPECIFIC CHEMICALS

Based upon site information provided by the NYSDEC, impacts to soil and groundwater have been identified at this site. Previous investigations have identified the following site contaminants:

Contaminants of Concern				
PCBs	Benzene	Toluene	Ethylbenzene	m + p Xylene
o-Xylene	t butylmethylether	t Butylbenzene	s Butylbenzene	p Isopropyltoluene
Naphthalene	n Propylbenzene	n Butylbenzene	Methyl Ethyl Ketone	Isopropylbenzene
Chloroethane	Chlorobenzene	1,4 Dichlorobenzene	1,2 Dichlorobenzene	Acetone
Lead	Mercury			

Other Potential Site Contaminants		
1,2,3 Trichlorobenzene	Benzo(a)anthracene	Diethylphthalate
1,2,4 Trichlorobenzene	Benzo(a)pyrene	Dimethylphthalate
1,2,4 Trimethylbenzene	Benzo(b)fluoranthene	Di-n-butylphthalate
1,3 Dichlorobenzene	Benzo(g,h,i)perylene	Fluorene
1,3,5 Trimethylbenzene	Benzo(k)fluoranthene	Hexachlorobutadiene
2,4-Dimethylphenol	bis(2-Ethylhexyl)phthalate	Indeno(1,2,3-cd)pyrene
2-Methylnaphthalene	Cadmium	Methylene Chloride
2-Methylphenol	Carbon Disulfide	p-cresol
4-Chloro-3-methylphenol	Carbon Tetrachloride	Phenanthrene
Acenaphthene	Chloride	Pyrene
Acenaphthylene	Chromium (total)	Selenium
Anthracene	Chrysene	Silver
Arsenic	Dibenzo(a,h)anthracene	Vinyl Acetate
Barium	Dibenzofuran	

### 5.1.2 WORK TASK RELATED CHEMICALS

During proposed work activities, workers may encounter some or all of the chemicals noted below. Precautions and safe work practices should be utilized while handling these chemicals.

Alconox	Bentonite	Portland Cement-Type I
Gasoline	Diesel	Liquinox
Methanol	Hydrochloric Acid <10%	Nitric Acid

### 5.2 RESPIRABLE DUST & VAPORS

The activities to be conducted under the limited scope of work for this project are not anticipated to generate significant dusts or vapors. Personnel need to be mindful, however, of avoiding inhalation of vapors from acid preservatives in sample containers, vapors that may accumulate in monitoring wells and crystalline silica dust during well installation, saw cutting or other related activities. Personnel should position themselves upwind of potential sources and avoid skin contact during sampling process. PPE requirements for inhalation hazards may be re-evaluated and adjusted based on actual site conditions.

During soil borings, well installation, soil vapor sampling and soil and groundwater sampling activities, air monitoring shall be conducted periodically within the work zone using a photo-ionization detector (PID). Air monitoring is to be conducted by the field geologist during drilling activities, and by the field foreman during groundwater sampling at monitoring wells.

#### 5.2.1 ACTION LEVELS

If PID readings in the work zone are >5 ppm (sustained for >5 minutes) work shall be temporarily discontinued and potential causes evaluated. If levels persist and cannot be mitigated, the HSO will be notified and an upgrade to Level C PPE will be implemented.

Dust may be generated during ground intrusive activities. If visible observation detects elevated levels of dust, a program of wetting will be employed.

### 5.3 PHYSICAL HAZARDS

The following physical hazards have been identified associated with the work to be performed and the site conditions:

- Drilling hazards
- Overhead/underground utilities
- Cold/Heat Stress
- Impact Injury
- Vehicular Traffic
- Drum & Container Handling/Heavy Loads
- Electrocutation
- Insect Stings/Bites, Irritating Vegetation, Sunburn

#### **5.4 JOB HAZARD ANALYSIS**

A Job Hazard Analysis (JHA) is a technique/form for identifying job hazards before they are encountered. The JHA outlines the steps/actions associated with each job task and establishes proper procedures and safety requirements for each step.

JHA's shall be completed for all field tasks prior to their execution and reviewed in the field during tailgate safety meetings.

Project JHA's are included as Appendix C.

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## **6.0 ENGINEERING CONTROLS, ADMINISTRATIVE CONTROLS, & WORK PRACTICE CONTROLS**

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EAR recognizes that engineering, work practice and administrative controls are the primary means of reducing employee exposure to occupational hazards.

Engineering controls minimize employee exposure by either reducing or removing the hazard at the source or isolating the worker from the hazard. Engineering controls could include eliminating toxic chemicals and substituting with non-toxic chemicals, enclosing work processes or restricting work operations, and the installation of general and local ventilation systems.

Work practice controls alter the manner in which a task is performed. Some fundamental work practice controls include: (a) changing existing work practices to follow procedures that minimize exposures while operating production and control equipment; (b) inspecting and maintaining process and control equipment on a regular basis; (c) implementing good housekeeping procedures; (d) providing good supervision, and (e) mandating that eating, drinking, smoking, chewing tobacco or gum, and applying cosmetics in regulated areas be prohibited.

Administrative controls include controlling employee exposure to potentially harmful levels by scheduling production and tasks in ways that minimize exposure.

When effective work practices or engineering controls are not feasible or while such controls are being instituted, appropriate personal protective equipment (PPE) will be used.

### **6.1 ENGINEERING CONTROLS – PROJECT SPECIFIC**

Monitoring and detection equipment will be calibrated, clean, and inspected prior to daily use, where applicable. Air monitoring for VOC's will be conducted at wellheads during groundwater sampling activities and at boreholes during drilling activities.

Drilling equipment will be inspected daily by the equipment operator. Good, operable equipment that is well maintained will minimize noise and exposure to machinery and moving parts.

Prior to any ground intrusive activities, markouts will be arranged and reviewed/validated.

### **6.2 WORK PRACTICE CONTROLS – PROJECT SPECIFIC**

Field personnel shall delineate the areas designated for drilling and sample collection and allow only essential (sampling/drilling) personnel into the area. Site activities will include good supervision and control with daily / periodic inspections; good housekeeping and work zone control; daily safety briefings on project specifics; daily equipment/ tool inspections, and holding trained employees to their responsibilities. No eating, drinking, or smoking will be permitted onsite.

Only authorized personnel shall be permitted to operate drilling equipment. All non-essential personnel are to keep clear of areas surrounding drilling systems when in use. Communication with all personnel will be maintained. "Show Me Your Hands" protocol will be observed.

### **6.3 PROJECT SITE CONTROL**

The purpose of project site control is to minimize potential contamination of workers, protect the public from the sites hazards, and prevent vandalism. Several site control procedures are to be implemented to reduce worker and public exposure to potential chemical, physical, biologic and safety hazards, including:

- Site map(s) (for lengthy or large-scope projects)

- Adequately preparing for site activities
- Delineating and restricting access to work area
- Utilizing the buddy system
- Establishing and enforcing decontamination procedures
- Establishing communication networks
- Enforcing safe work practices
- Placement of safety fencing or traffic cones to secure work area

Site communication will be established by internal communication among the project personnel on site and external communication between on-site and off-site personnel involved in the project.

Internal communication will be established to...

- Alert team members to emergencies
- Communicate safety information during work
- Communicate work / project changes
- Maintain site control

The external communication system utilized by EAR project personnel is necessary to...

- Coordinate emergency response if needed
- Communicate with off-site project / management personnel

**Note:** Project personnel will be equipped with cell phones.

Decontamination Procedures – The process of removing or neutralizing contaminants that have accumulated on personnel and equipment is critical to health and safety at project sites where the potential for contamination exists. Decontamination procedures are detailed in Section 8.0.

Emergency Response & Emergency Coordination – EAR believes that proper planning and response are vital elements of the HASP that will help minimize employee exposure and injury.

Emergencies happen quickly and unexpectedly and require immediate response. Any hazard on site can precipitate an emergency; therefore the following procedure(s) will be implemented and reviewed periodically to ensure effectiveness. Prior to project start-up, the HSO and project manager will ensure the following:

- Site communication system are in good working order and easily accessible
- Emergency response phone numbers are operable and accessible
- Emergency evacuation routes have been explained and identified
- Medical first-aid material is on site
- Project fire extinguishers are accessible, charged and operable
- HASP is available and reviewed

Emergency Response procedures are detailed in Section 18.0.

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## 7.0 PERSONAL PROTECTIVE EQUIPMENT

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The HSO and field foreman will determine the Personal Protective Equipment (PPE) required in the work area. This decision will be based upon the nature of the contaminants known, or expected to be encountered on site, and the type of work to be performed. If site conditions or the type of work change, the required PPE may have to be altered to meet changing conditions. **It is anticipated that entirety of the work will be performed in Level D PPE.**

Head Protection – Hard hats shall be issued and worn during the project whenever overhead equipment is in use, or whenever there is a potential for an employee’s head being struck by an object. Hard hats will also be worn where the project location is in proximity to either public vehicular traffic (high visibility), or live electric exist (voltage rated). Use of ANSI approved Type I Class G helmets will be utilized as necessary.

Eye and Face Protection – Impact resistant goggles, chemical resistant splash goggles, and safety glasses will be available and utilized at the discretion of the HSO and field foreman.

Foot Protection – Industrial foot protection will be worn by all personnel entering the worksite regardless of their assigned activity. Steel-toed boots will be utilized and worn by personnel requiring their use at the discretion of the Safety Officer. Overboots (disposable or otherwise) with skid-resistant soles will be worn in wet areas (ie. retention ponds, swales, drainage ditches, culverts).

Hand Protection – Canvas / leather work gloves will be issued and available for every employee assigned to a project. Nitrile gloves will be worn by personnel handling site soils, conducting environmental quality sampling (as applicable), and for medical response situations.

Respiratory Protection – It is not anticipated that respiratory protection will be required to complete the scope of work for this project. Actual site conditions may warrant an upgrade in PPE pending evaluation by the Safety Officer. Therefore, all onsite personnel working at boreholes/wellheads should be ready to don Level C respiratory protection (P100 & organic vapor filtration) in the event a PPE upgrade is required.

**Note:** EAR has a written Respiratory Protection Program in compliance with 1910.134 and is available upon request. All company personnel required to don respiratory protection shall be medically cleared and fit-tested prior to use.

Body Protection – TYVEK suits will be available for use at the discretion of the field personnel, or if the Safety Officer deems necessary based on actual or changing site conditions. Simple white TYVEK suits will be available for soil excavation / sampling / drilling related tasks. Yellow TYVEK<sup>1</sup> suits will be available and worn with chemical splash, gases, or vapor penetration concerns.

**Note:** Should the need arise; The Company will fully comply with 1910.120 *Hazardous Waste Operations and Emergency Response* (HAZWOPER). Depending upon the hazard evaluation of the services to be provided at the site, the following levels of PPE will be employed:

**Level A** – To be selected when the greatest level of skin, respiratory, and eye protection is required.

1. Pressure-demand, full face-piece self-contained breathing apparatus (SCBA), or pressure demand supplied air respirator with escape SCBA (NIOSH approved).

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<sup>1</sup> If chemical resistant suits are required, personnel shall receive supplementary training on work methods, fluid intake, and heat exhaustion monitoring. The use of chemical resistant suits is not currently anticipated at this site.

2. Totally encapsulating chemical-protective suit.
3. Coveralls\*
4. Long underwear\*
5. Gloves, outer, chemical-resistant
6. Gloves, inner, chemical-resistant
7. Boots, chemical-resistant steel toe and shank
8. Hard hat (under suit)\*
9. Disposable protective suit, gloves and boots (depending on suit construction, may be worn over totally-encapsulating suit).
10. Two-way radios (worn inside encapsulating suit)

**Level B** – The highest level of respiratory protection is necessary but a lesser level of skin protection is required.

1. Pressure-demand, full face-piece self-contained breathing apparatus (SCBA) or pressure-demand supplied air respirator with escape SCBA (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls)
3. Coveralls
4. Gloves, outer, chemical resistant
5. Gloves, inner, chemical resistant
6. Boots, outer, chemical resistant steel toe and shank
7. Boot-covers, outer, chemical resistant (disposable)\*
8. Hard hat
9. Two-way radios
10. Face shield\*

**Level C** – The concentration(s) and types(s) of airborne substances is known and the criteria for using air purifying respirators are met.

1. Full-face or half-mask, air purifying, canister-equipped respirators (NIOSH approved)
2. Tyvek suit or chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls) depending on the hazards present
3. Coveralls
4. Gloves, outer, chemical resistant
5. Gloves, inner, chemical resistant
6. Boots (outer), chemical resistant steel toe and shank\*
7. Boot-covers, outer, chemical resistant (disposable)
8. Hard hat
9. Escape mask\*
10. Two-way radios (worn under outside protective clothing)
11. Face shield\*

**Level D** –A work uniform, affording minimal protection: used for nuisance contamination only.

1. Disposable Tyvek suit\*
2. Gloves
3. Boots / shoes, steel toe and shank
4. Boots, outer, chemical-resistant (disposable)
5. Safety glasses or chemical splash goggles\*
6. Hard hat
7. Face shield\*

\*Optional, as applicable

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## 8.0 DECONTAMINATION

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### 8.1 PERSONNEL DECONTAMINATION

The first step in decontamination is prevention. Personnel shall wear disposable PPE as appropriate and practice work habits that minimize contact with contaminated or potentially contaminated media.

If using non-disposable overboots, a portable boot wash station shall be utilized to remove gross contamination prior to removal. The boot wash station shall be situated at a designated access/egress point to be determined (based on location of daily activities) and described during the daily tailgate safety meetings. The station/components shall consist of a suitably sized bucket or container, potable water, 3-5 gallon bucket with potable water and anionic detergent, and scrub brush. Procedure is as follows:

1. Using brush and bucket with a water and detergent mix, remove gross contamination, over a bucket.
2. Rinse clean with potable water

Rinsate shall be transferred to 55-gallon drums for characterization and offsite disposal. Disposable PPE (gloves, disposable overboots) shall be double bagged and disposed of as non-regulated wastes.

### 8.2 EQUIPMENT DECONTAMINATION

Non-dedicated sampling equipment (Monsoon pumps, water level meters, foot valves, steel sampling spoons) is to be decontaminated between each sample location. The equipment decontamination station/components shall consist of a suitably sized bucket or container, potable water, 3-5 gallon bucket with potable water and anionic detergent, and scrub brush. Procedure is as follows:

1. Using brush and bucket with a water and detergent mix, remove gross contamination, over a bucket.
2. Rinse clean with potable water

Rinsate shall be transferred to 55-gallon drums for characterization and offsite disposal.

Down-hole drilling equipment is to be decontaminated between each borehole. The equipment decontamination station/components shall consist of a suitably sized decontamination pad, potable water, anionic detergent, and scrub brush and/or high pressure washer. Procedure is as follows:

1. Over decon pad, remove gross contamination using scrub brush and/or high-pressure rinse with water and detergent mix.
2. Rinse clean with potable water.

Rinsate shall be transferred to 55-gallon drums for characterization and offsite disposal.



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## **9.0 FIRST AID KITS, EYEWASH, AND FIRE EXTINGUISHERS**

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First aid kits and fire extinguishers are available and accessible on all project field vehicles. All fire extinguishers shall be (minimum) 12-lb, UL-approved, Class ABC dry extinguishers.

Eyewash shall be located in all project field vehicles.

### **9.1 EQUIPMENT INSPECTIONS**

First aid kits, eyewash, and fire extinguishers are to be inspected on a monthly basis by personnel designated by the HSO. During inspections, first aid & eyewash kits will be examined for any missing components as well as for materials that may have reached expiration dates. Fire extinguishers will be inspected for dents, rusting, to ensure pin and hamper are intact, and that pressure is at the recommended level.

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## **10.0 SANITATION**

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Eating and drinking are prohibited in the work zone. Personnel are to follow decontamination procedures and remove PPE and disposable outerwear before entering vehicles, using the restroom, or eating and drinking. Personnel are to wash hands prior to eating, drinking, or using the restroom.

## **10.2 HOUSEHOLD TRASH**

Household trash is to be placed in contractor quality garbage bags and transported offsite daily for disposal via municipal waste streams.

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## 11.0 HEAT & COLD STRESS

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### 11.1 WORKING IN COLD RELATED STRESS ENVIRONMENTS

Hypothermia results when the body loses heat faster than it can produce it. When this situation first occurs, blood vessels in the skin constrict in an attempt to conserve vital internal heat. Hands and feet are affected first. If the body were to continue to lose heat, involuntary shivers would begin which is the body's way of attempting to produce heat, and is the first real warning sign of hypothermia.

An individual generates body heat from food and muscular activity, and loses heat through convection, conduction, radiating, and sweating, in an attempt to maintain a constant (regulated) body temperature. General physical activity acts to increase metabolic heat, with clothing providing the proper insulation to minimize heat loss. When clothing becomes wet (i.e. contact with water in trenches, hydrant flushes, or sweat during intense physical work like continuous shoveling) its cold-insulating property will be compromised.

The four environmental conditions that cause cold-related stress to the body are low temperatures, high / cool winds, dampness, and cold water. A wind-chill effect is created when high/ cool winds blow away the warm air between your body and layers of clothes to the outside air.

#### 11.1.1 PROTECTIVE MEASURES

Protective clothing is perhaps the most important step in fighting the elements. A relatively small temperature drop in the body core (about 2 degrees F) produces shivering. Therefore, EAR will recommend its employees do the following:

- Wear an outer layer to break the wind;
- Wear a middle layer of down or wool to absorb sweat and retain insulation when wet
- Wear an inner layer of cotton or synthetic weave to allow ventilation

Personnel will pay special attention to protecting feet, hands, face, and head. Up to 40% of body heat can be lost when the head is exposed. Footgear will be insulated to protect against cold and dampness. Our field personnel, who will be required to maintain long periods of time in the cold, will keep a change of dry clothes available should their work garments become wet. The project decontamination trailer will provide a climate-controlled environment for decontamination and changing.

### 11.2 WORKING IN HEAT RELATED STRESS ENVIRONMENTS

The combination of heat, humidity and physical labor can lead to fatalities, or produce other heat-related occupational injuries and/or illnesses serious enough to result in lost work time. The purpose of this program is to provide basic guidelines for EAR employees required to perform work tasks in adverse heat-related conditions and to ensure that the potential for harm is minimized, if not eliminated.

#### References

OSHA Trade News Release "Protecting Workers in Hot Summer Weather"  
U.S. Dept. of Health & Human Services "Working in Hot Environments"  
OSHA Technical Manual; Section 3 "Heat Stress"  
Roger L. Brauer Safety & Health for Engineers

### 11.2.1 TERMS & CONCEPTS

Conduction – is the transfer of heat between materials that contact each other. Heat passes from the warmer material to the cooler material. For example, a worker's skin can transfer heat to a contacting surface if that surface is cooler, and vice versa. Conduction is of little significance in air environments. However, in an underwater environment it is the dominant mode of heat transfer.

Convection – is the transfer of heat in a moving fluid. Air flowing past the body can cool the body if the air temperature is cool. On the other hand, air that exceeds 95 °F can increase the heat load on the body. If the skin temperature is higher than the surrounding air, heat will be removed from the body. If the air temperature is higher than skin temperature, heat will be added to the body, adding to the burden of metabolic heat that must be removed through radiation or evaporation to maintain a constant body temperature.

Air speed affects the rate of heat transfer by convection. Whether heat is being added or removed, a fourfold increase in air speed will about double the rate of heat transfer. Having a fan blow air over the body when the air temperature is higher than skin temperature actually adds heat to the body by convection.

Evaporation – Humans have the capability to sweat as a means for cooling the body. Sweat glands in the skin secrete sweat, which is primarily water containing some dissolved salts. Sweat increases as the thermal regulation system in the body requires increased cooling to remove heat. Cooling occurs from the phase change of liquid to vapor when water evaporates from the skin. The maximum amount of cooling that can be achieved through sweating is a function of air speed and the ability of the surrounding air to accept additional moisture.

In hot, humid conditions the vapor pressures in air and at the skin surface are nearly the same. Cooling through evaporation of sweat is then limited by the environment. In hot, dry environments the difference in vapor pressures is large and the evaporation is rapid. In those circumstances where evaporation occurs rapidly, the actual cooling of the body may be limited by the maximum rate at which sweat is produced.

Humidity – absolute humidity is the weight of water vapor per unit volume. Relative humidity is the ratio of the actual partial vapor pressure of the water vapor in a space to the saturation pressure of pure water at the same temperature.

Metabolism – is a by-product of the body's activity. It is known as the rate at which heat is produced in the body which is determined by the activity being performed by the body. Cells in the body burn oxygen and nutrients in performing their functions and heat is produced in the chemical process of combustion. Cells produce more heat with increased activity and the total amount of heat produced by the body is determined by the activity of the body. Typical values of oxygen consumption for various activities are listed in Table 1.

Radiation – is the transfer of heat energy through space. A worker whose body temperature is greater than the temperature of the surrounding surfaces radiates heat to these surfaces. Hot surfaces and infrared light sources radiate heat and can increase the body's heat load.

### 11.2.1.1 Metabolic Costs (Oxygen Consumption for Selected Activities)

<u>Activity</u>	<u>Cost (kcal/hour)</u>
<b>General</b>	
Light work	Up to 200
Moderate work	200-350
Heavy work	350-500
<b>Resting</b>	
Sleeping	70-75
Sitting quietly	80-100
Standing relaxed	110
<b>Work</b>	
Drafting	115
Driving a car	
Light traffic	80
Heavy traffic	190
Carpentry	230
Welding	180
Shoveling	410
Sweeping floors	235
Sawing wood by hand	480
<b>Recreation</b>	
Volleyball	210
Tennis	425
Swimming	400-550
Dancing, moderately	250
Basketball	515

### 11.2.2 ADVERSE HEALTH EFFECTS FROM EXPOSURE TO HEAT

Fainting – A worker who is not accustomed to hot environments and who stands erect and immobile in the heat may faint. With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain. Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting.

Heat Cramps – Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly thereafter, the low salt level in the muscles causes painful cramps. The affected muscles may be part of the arms, legs or abdomen, but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

Heat Exhaustion – Heat exhaustion includes several clinical disorders having symptoms which may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences

extreme weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

**Heat Rash** –Heat rash, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can become very uncomfortable and may reduce a worker's performance.

**Heat Stroke** – Heat stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, red or spotted. Body temperature is usually 105°F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

**Transient Heat Fatigue** –This refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance. The severity of transient heat fatigue will be lessened by a period of gradual adjustment to the hot environment (heat acclimatization).

The human body has a remarkable complex and delicate mechanism whose purpose is to hold body temperature within extremely narrow limits despite a wide range of external air conditions. The human body has remarkable powers of adaptation. As soon as skin temperature rises or falls above or below an optimum, the body sets out to correct matters. Sweat is secreted in a hot environment and blood is redistributed between the skin and deeper tissues in a cold environment. In this way a two-sided mechanism controls the body temperature by a) regulation of internal heat production (chemical regulation) and b) regulation of heat loss through automatic variation in skin circulation and the operation of sweat glands (physical regulation).

Problems of heat stress are more common than those presented by a very cold environment. The blood carries heat from deep within the body to the skin where heat can be dissipated by convection, radiation, or evaporation. Warming Occurs when a hot environment places an additional load on the cardiovascular system of an individual and the transfer of heat from the body is not adequate. Excessive warming of the body can lead to heat cramps, heat exhaustion and sometimes heat stroke. The rate at which metabolic heat is produced in the body must be balanced by the rate at which heat is lost to the environment.

One of the best ways to reduce heat stress on workers is to minimize heat in the workplace. However, the work environment for our project employees is obviously difficult to control being exposed to the weather elements year round. Although humans are, to a large extent, capable of adjusting to the heat, it normally takes about 5-7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

On the first day of work in a hot environment (heat & humidity), the body temperature, pulse rate and general discomfort will be higher. With each succeeding daily exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body becomes acclimated to the heat, the worker will find it possible to perform work with less strain and distress.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat disorders in general are more likely to occur among workers who have not been given time to adjust to working in the heat or among workers who have been away from hot environments and who have gotten

accustomed to lower temperatures. Hot weather conditions of the summer are likely to affect the worker who is not acclimatized to heat.

### 11.2.3 OPERATIONAL WORK PRACTICES, ADMINISTRATIVE CONTROLS & SAFETY GUIDELINES

Whenever the anticipated heat indices reach a “targeted level” of 90°F and 90% humidity, the following measures will be activated:

- Rotation of the job task whenever possible by on-site personnel (regardless of title)
- Should job task rotation not be possible, a five minute break should follow every 15 minutes of activity (specific activities addressed: shoveling, equipment operators)
- A steady methodical work pace adjusted to the elements, avoiding short bursts of activity
- Maintain minimal skin exposure to the sun: wear T-shirts to absorb the sweat (the body actually stays cooler with a light shirt as opposed to no shirt at all), and do not stand in the sun whenever it can be avoided.

As mentioned earlier, the secretion of sweat is the body’s process of regulating / maintaining the body’s core temperature. A worker may produce as much as two to three gallons of sweat over the course of a day and needs to have that replaced. Fluid intervals should be at regular intervals (as opposed to a gallon at lunch) and the fluid does not need to be cold. Potable water supplied in the vehicle coolers should be dispensed throughout the day. However, water intake alone does not address the body’s need for salt loss, which can lead to muscle cramping. When the heat indices reaches the “targeted level” of 90°F and 90% humidity, EAR will dispense electrolyte fluids to workers / crews involved with the activities identified above, at the start of the day. The distribution program will be managed by the Site Manager in coordination with each project site location. The electrolyte fluid should be taken after lunch, at the start of the second half of the work day.

Smart, practical, common sense approaches to working in heat stress environments, along with proper guidance from supervision, will complement the guidelines identified in this program to ensure that EAR employees avoid preventable illness and unnecessary injuries while performing assigned job tasks.

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## 12.0 HAZARD COMMUNICATION & CHEMICAL USAGE

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Purpose - To ensure that the hazards associated with all chemicals utilized by EAR employees are first evaluated, and that information is then passed on to the employee using them through:

- a) Company provided training
- b) Safety Data Sheet (SDS) information
- c) Chemical product container labeling information
- d) Issuance of PPE

Procedure – EAR shall require each and every chemical manufacturer that supplies our company with a chemical product, to accompany that product with its SDS and hazardous information label on the original container.

Based on the information contained in the SDS, along with the intended use of the product, EAR shall provide employee training about potential hazards and what protective measures they and EAR shall use to minimize the potential for exposure and risk to injury or illness.

Responsibilities – Project Manager shall list all chemicals to be used at a project site. The SDS's for those products will be on site and accessible for site employees involved with the project. The Project Manager shall also ensure that each and every chemical product container has the required information on its label. Should a chemical need to be transferred to another container, the Hazardous Material Information System label shall be utilized with appropriate numerical codes for Health, Flammability and Reactivity.

Should any chemical products be utilized for a project, the safe handling information received by the employees shall be adhered to. It will be their responsibility to apply information received from the Project Manager, the SDS and the container label to properly protect themselves through the use of controls and assigned PPE.

A copy of the written Hazard Communication Program is available upon request.

References – “Occupational Safety & Health Administration Code of Federal Regulations Part 1910.1200”



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### 13.0 HANDLING AND LABELING OF DRUMS AND CONTAINERS

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- Prior to handling a drum or container, The Company shall assure that the drums or containers used for the project meet the required OSHA, EPA (40 CFR Parts 264-265 and 300) and DOT regulations (49 CFR Parts 171-178), and are properly inspected and labeled prior to use.
- Damaged drums or containers will be emptied of their contents and properly discarded, or placed in an over pack drum to prevent leakage of waste.
- Should the drums be utilized for contaminated soil or soil/sludge liquids, EAR shall have available salvage drums, absorbent materials, and general clean-up tools.
- To the extent feasible, the moving of drums / containers will be kept to a minimum. Should the movement or opening of drums be deemed necessary by project circumstances then employees shall utilize extreme caution during the processes of venting, tipping, crushing, emptying (liquid transfer), or transporting (hand truck or forklift with attachment). All drums and/or containers utilized by The Company shall be promptly closed/sealed and labeled immediately upon being filled.
- Field foreman and HSO shall determine appropriate PPE for all employees handling or working around site drums and containers.
- Prior to the drums being shipped off-site from the project to a licensed disposal facility, all containers shall be properly labeled and packaged with accompanying waste manifests.

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## 14.0 FIRE PROTECTION & PREVENTION

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EAR complies with all applicable laws, regulations, codes, and good practices pertaining to fire prevention. This Fire Prevention Plan serves to reduce the risk of fires as follows:

### 14.1 GOOD HOUSEKEEPING / GENERAL

To limit the risk of fires, employees shall take the following precautions:

- Minimize the storage of combustible materials.
- Make sure that exit routes and walkways are kept free of obstructions.
- Dispose of combustible waste in covered, airtight, metal containers.
- Use and store flammable materials in well-ventilated areas away from ignition sources.
- Use only nonflammable cleaning products.
- Keep incompatible (i.e., chemically reactive) substances away from each other.
- Keep equipment in good working order (i.e., inspect electrical wiring and appliances regularly and keep motors and machine tools free of dust and grease.
- Ensure that heating units are safeguarded.
- Repair and clean up flammable liquid leaks immediately.
- Keep work areas free of dust, lint, sawdust, scraps, and similar material.
- Do not rely on extension cords if wiring improvements are needed, and take care not to overload circuits with multiple pieces of equipment.
- Turn off electrical equipment when not in use.

### 14.2 MAINTENANCE

Field personnel will ensure that equipment is maintained according to manufacturers' specifications. EAR will also comply with requirements of the National Fire Protection Association (NFPA) codes for specific equipment. Only properly trained individuals shall perform maintenance work.

The following equipment is subject to the inspection and maintenance on an as used basis, but no less than a frequency of once per quarter:

- Portable fire extinguishers
- All power tools

### 14.3 TYPES OF HAZARDS

The following sections address the major workplace fire hazards at EAR facilities and the procedures for controlling the hazards.

#### 14.3.1 ELECTRICAL FIRE HAZARDS

Electrical system failures and the misuse of electrical equipment are leading causes of workplace fires. Fires can result from loose ground connections, wiring with frayed insulation, or overloaded fuses, circuits, motors, or outlets.

To prevent electrical fires, employees shall:

- Make sure that worn wires are replaced.
- Use only appropriately rated fuses.
- Never use extension cords as substitutes for wiring improvements.
- Use only approved extension cords [i.e., those with the Underwriters Laboratory (UL) or Factory Mutual (FM) label].
- Check wiring in hazardous locations where the risk of fire is especially high.
- Check electrical equipment to ensure that it is either properly grounded or double insulated.
- Ensure adequate spacing while performing maintenance.

#### 14.3.2 FLAMMABLE AND COMBUSTIBLE MATERIALS

Certain types of substances can ignite at relatively low temperatures or pose a risk of catastrophic explosion if ignited. Such substances obviously require special care and handling.

##### 1. Class A combustibles.

These include common combustible materials (wood, paper, cloth, rubber, and plastics) that can act as fuel and are found in non-specialized areas such as offices.

To handle Class A combustibles safely:

- a. Dispose of waste daily.
- b. Keep work areas clean and free of fuel paths that could allow a fire to spread.
- c. Do not order excessive amounts of combustibles.
- d. Make frequent inspections to anticipate fires before they start.

Water, multi-purpose dry chemical (ABC), and halon 1211 are approved fire extinguishing agents for Class A combustibles.

##### 2. Class B combustibles.

These include flammable and combustible liquids (oils, greases, tars, oil-based paints, and lacquers), flammable gases, and flammable aerosols.

To handle Class B combustibles safely:

- a. Use only approved pumps, taking suction from the top, to dispense liquids from tanks, drums, barrels, or similar containers (or use approved self-closing valves or faucets).
- b. Do not dispense Class B flammable liquids into containers unless the nozzle and container are electrically interconnected by contact or by a bonding wire. Either the tank or container must be grounded.
- c. Store, handle, and use Class B combustibles only in approved locations where vapors are prevented from reaching ignition sources such as heating or electric equipment, open flames, or mechanical or electric sparks.
- d. Do not use a flammable liquid as a cleaning agent inside the system equipment container.
- e. Do not use, handle, or store Class B combustibles near exits, stairs, or any other areas normally used as exits.

- f. Do not cut, grind, or use unsafe electrical appliances or equipment near Class B combustibles.
- g. Know the location of and how to use the nearest portable fire extinguisher rated for Class B fire.

Water should not be used to extinguish Class B fires caused by flammable liquids. Water can cause the burning liquid to spread, making the fire worse. To extinguish a fire caused by flammable liquids, exclude the air around the burning liquid. The following fire-extinguishing agents are approved for Class B combustibles: carbon dioxide, multi-purpose dry chemical (ABC), halon 1301, and halon 1211. (**NOTE:** Halon has been determined to be an ozone-depleting substance and is no longer being manufactured. Existing systems using halon can be kept in place.)

#### 14.3.3 SMOKING

Smoking is prohibited at the job site.

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## 15.0 ELECTRICAL HAZARDS

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Electrical accidents are generally caused by a combination of three possible factors: unsafe equipment and / or insulation, workplace made unsafe by the environment, and unsafe work practices. There are various ways of protecting people from the hazards caused by electricity. These include: insulation, guarding, grounding, mechanical devices and safe work practices.

Insulation - One way to safeguard individuals from electrically energized wires and parts is through insulation. An insulator is any material with high resistance to electric current. Insulators such as glass, mica, rubber, and plastic, are put on conductors to prevent shock, fires, and short circuits. Before employees of EAR prepare to work with electric equipment, they will check the insulation before making a connection to a power source to be sure there are no exposed wires. The insulation of flexible cords, such as extension cords, is particularly vulnerable to damage.

Guarding – Live parts of electric equipment operating at 50 volts or more must be guarded against accidental contact. Guarding of live parts may be accomplished by:

- Location in a room, vault or similar enclosure accessible only to qualified persons
- Use of permanent, substantial partitions or screens to exclude unqualified persons
- Location on a suitable balcony, gallery, or platform elevated and arranged to exclude unqualified persons, or
- Elevation of 8 feet or more above the floor.

Entrances to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

Indoor electric installations that are over 600 volts and that are open to unqualified persons must be made with metal-enclosed equipment or enclosed in a vault or area controlled by a lock. In addition, equipment must be marked with appropriate caution signs.

EAR does not anticipate employee exposure to any live parts of electric equipment during field project(s).

Grounding – Grounding is another method of protecting employees from electric shock, however, it is normally a secondary protective measure. The term “ground” refers to a conductive body that has a conductive connection, whether intentional or accidental, by which an electric current or equipment is connected to earth or ground plane.

By “grounding” a tool or electrical system, a low-resistance path to the earth is intentionally created. When properly done, this path offers sufficiently low resistance and has sufficient current carrying capacity to prevent the build-up of voltages that may result in a personal hazard. It will, however, substantially reduce the possibility of injuries and death, especially when used in combination with the other safety measures.

There are two kinds of grounds required by “Design Safety Standards for Electrical Systems”. One of these is called the “service or system ground”. In this instance, one wire – called the “neutral conductor” or “grounded conductor” – is grounded. In an ordinary low voltage circuit, the white (or gray) wire is grounded at the generator or transformer and again at the service entrance of the building. This type of ground is primarily designed to protect machines, tools, and insulation against damage.

To offer enhanced protection to the workers themselves, a second type of ground called the “equipment ground”, must be furnished by providing another path from the tool or machine through which the current can flow to the ground. This additional ground safeguards the electric equipment operator in the event that a

malfunction causes the metal frame of the tool to become accidentally energized. The resulting surge of current will then activate the circuit protection devices and open the circuit.

Circuit Protection Devices – Circuit protection devices are designed to automatically limit or shut off the flow of electricity in the event of a ground-fault, overload, or short circuit in the wiring system. Fuses, circuit breakers, and ground-fault circuit interrupters are three well-known examples of such devices.

Fuses or circuit breakers are over-current devices that are placed in circuits to monitor the amount of current that the circuit will carry. They automatically open or break the circuit when the amount of current flow becomes excessive and therefore unsafe. Fuses are designed to melt when too much current flows through them. Circuit breakers, on the other hand, are designed to trip open the circuit by electro-mechanical means.

Fuses and circuit breakers are intended primarily for the protection of conductors and equipment. They prevent overheating of wires and components that might otherwise create hazards for operators. They also open the circuit under certain hazardous ground-fault conditions.

Whenever company personnel utilize customer supplied power for tools or equipment, they will ensure that circuit protection devices are in place and functioning.

The ground-fault circuit interrupter or GFCI is designed to shut off electric power within as little as 1/40 of a second. It works by comparing the amount of current going to an electric device against the amount of current returning from the device along the circuit conductors. The GFCI is used in high risk areas such as wet locations and construction sites. A GFCI is to be employed when feasible with the use of electric cords and/or power tools.

Safe Work Practices – Employees of EAR working with electrical equipment are required to use safe work practices. These include: de-energizing electric equipment before inspecting or making repairs; only using power tools that are in good condition and are insulated; using good judgment when working near energized lines; and using appropriate protective equipment.

Accidental or unexpected sudden starting of electrical equipment can cause severe injury or death. Before any inspections or repairs are made, the current will be turned off at the switch box (energy isolating device) and the switch padlocked in the off position. At the same time, the switch or controls of the machine or other equipment being locked out of service will be securely tagged to show which equipment or circuits are being worked on.

**Note:** As per CFR 1910.147 *Control of Hazardous Energy*, all electrical work performed by EAR personnel will be in accordance with noted regulations. Only properly trained EAR personnel will perform repair or maintenance on electrical equipment or machinery, should the need arise.

To maximize his or her own safety, employees of EAR will be equipped with tools right for the job, or task at hand. They will be inspected prior to use, and discarded should a defect be discovered. Tools and equipment will be maintained daily. Inadequate maintenance can cause equipment to deteriorate, resulting in an unsafe condition.

Perhaps the single most successful defense against electrical accidents is the continuous exercising of good judgment or common sense. All employees of any project will be thoroughly familiar with the safe work procedures identified for their specific tasks.

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## **16.0 HEARING PROTECTION**

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Hearing protection will be utilized at all locations where equipment such as jackhammers, sawcutters, blowers, pumps, and other equipment generating loud noises (above 85 dB) are operated.

A copy of EAR's Hearing Conservation Program is available upon request.

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## 17.0 DRUG & ALCOHOL TESTING / DRUG FREE WORKPLACE

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EAR believes in a drug-free workplace. Under the *Omnibus Transportation Employee Testing Act of 1991*, the *Drug-Free Workplace Act of 1988* and in accordance with the regulatory requirements of 49 CFR Parts 40 and 382 (August 2008), we are committed to ensuring that employees of EAR are performing their job functions free from the influence of any illegal substances for the health and well-being of themselves, their fellow employees, and for the general public. This commitment will minimize, if not eliminate, the potential for workplace accidents and injuries due to the diminished capacities of employees who would otherwise act irresponsibly.

The Drug-Free Workplace Act specifically requires EAR to notify each employee that, as a condition of employment, they must:

- Comply with the Company's Drug-Free Workplace Policy.
- Notify The Company of any conviction for a drug-related offense committed in the workplace within three (3) days of such conviction.
- Any employee who violates this company policy shall be subject to disciplinary action including termination of employment.

### 17.1 PROHIBITIONS

EAR's Drug-Free Workplace prohibits employees from engaging in any of the following activities:

- Use, possession, manufacture, distribution, dispensation or sale of illegal drugs on Company premises or Company business, in Company supplied vehicles, at job sites or during working hours.
- Unauthorized use or possession, or any manufacture, distribution, dispensation or sale of a controlled substance on company premises or job sites or while on Company business or while in Company supplied vehicles.
- Storing in a locker, desk, automobile or other repository on Company premises or job sites any controlled substances whose use is unauthorized.
- Being under the influence of a controlled substance on Company premises or while on Company business, job sites, or while in Company supplied vehicles.
- Any possession, use, manufacture, distribution, dispensation or sale of illegal drugs off Company premises that adversely affects the individual's work performance, their own or the safety of others at work, or the Company's regard or reputation in the community.
- Failure to adhere to the requirements of any drug treatment or counseling program in which the employee is enrolled.
- Failure to notify the Company of any conviction under criminal drug statutes for a workplace offense within three (3) days of the conviction;
- Refusal to abide by the Company's Drug-Free Workplace policy.
- Unauthorized use of prescribed medicine. An employee undergoing prescribed medical treatment with a drug, which may alter their physical or mental ability, must report this treatment to the Company's President. The President should determine whether a temporary change in the employee's job assignment is warranted during the period of treatment.



## 17.2 DRUG AND ALCOHOL TESTING

Under the *Omnibus Transportation Employee Testing Act of 1991*, EAR has a drug and alcohol testing program for all employees required to operate a commercial motor vehicle having a gross vehicle weight rating (GVWR) of 26,001 or more pounds over the course of their workday. Testing will be carried out under the following conditions:

- Pre-employment
- Random
- Reasonable Suspicion (including an outside conviction)
- Post-Accident

Employees who hold a commercial driver's license (CDL) and who operate a commercial motor vehicle of 26,001 or more pounds, will be subject to random drug testing during the course of their employment with the company. In accordance with the new regulatory requirements, 50% of the workforce will be subject to drug testing and 10% subject to alcohol testing, annually. Post-accident testing will be conducted if the motor vehicle accident involves the following:

The accident occurs in a vehicle that requires a CDL to operate

and

The accident involved a citation to our CDL driver that involved:

- A vehicle being towed away
- A party involved was injured and required immediate attention
- A fatality occurred

## 17.3 DISCIPLINARY ACTIONS

A violation of the Company's Drug-Free Workplace Policy may result in disciplinary action, up to and including termination of employment, at the company's sole discretion.

In addition to any disciplinary action, the Company may, in its sole discretion, refer the employee to a treatment and counseling program for drug abuse. Employees referred to such a program by the Company must immediately cease any drug use, may be subject to periodic unannounced testing for a period of twenty-four (24) month, and must comply with all other conditions of the treatment and counseling program.

The Company shall determine whether an employee if referred for drug treatment and counseling should be temporarily reassigned to another position for safety reasons. The Company should promptly terminate any employee who tests positive for drugs while undergoing treatment and counseling for drug abuse.

## 17.4 DRUG AWARENESS PROGRAM

In an effort to assist employees and their families in understanding and avoiding the perils of drug abuse, EAR has developed this comprehensive Drug Awareness Program. EAR will use this program in an educational effort to prevent and eliminate drug abuse that may affect the workplace.

The Drug Awareness Program should inform employees about:

- Dangers of drug abuse in the workplace.
- The Company's Drug-Free Workplace Policy.
- Availability of treatment and counseling for employees who voluntarily seek such assistance.
- Disciplinary actions for violations of the Company's Drug-Free Workplace Policy.

Employees of the EAR are our most valuable resource and, for that reason, their health and safety is our number one concern. Any drug use, which imperils the health and well-being of our employees or threatens Company business will not be tolerated.

The use of illegal drugs and abuse of other controlled substances on or off duty is inconsistent with the law-abiding behavior expected of citizens. Employees who use illegal drugs or abuse other controlled substances on or off duty tend to be less productive, less reliable, and prone to greater absenteeism. This, in turn, can result in increased costs, delays and risks to the Company's business.

Drug use in the workplace puts the health and safety of the abuser and all other workers around them at increased risk. Employees have the right to work in a drug-free environment. In addition, drug abuse inflicts a terrible toll on the nation's productive resources and the health and well-being of American workers.

Early recognition and treatment of drug abuse is important for successful rehabilitation. Whenever feasible, the Company will assist employees in overcoming drug abuse by providing information on treatment opportunities and programs. However, the decision to seek diagnosis and accept treatment for drug abuse is primarily the individual employee's responsibility.

Employees with drug abuse problems should request assistance from management. The Company should treat all such requests confidentially and should refer the employee to the appropriate treatment and counseling services. Employees who voluntarily request the Company's assistance in dealing with a drug abuse problem may do so without jeopardizing their continued employment, provided they strictly adhere to the terms of their treatment and counseling program.

At a minimum, these terms include the immediate cessation of any use of drugs, and participation, where required by a program, in periodic unannounced testing for a twenty-four (24) month period following enrollment in the program.

Voluntary requests for assistance from employees should not, however, prevent disciplinary action for violation of the Company's Drug Free Workplace Policy.

EAR has a "zero tolerance" level program. The Company is committed to maintaining a safe workplace free from the influence of drugs. All employees are hereby notified that the Company should comply with the requirements of the Drug-Free Workplace Act of 1988, and all applicable regulations issued there under, as well as, when applicable, any more stringent rules created by other federal agencies.

EAR's Drug Awareness Program does not create an employment contract between the employer and employee. Furthermore, the Company has the sole right to modify the policy and program at any time.

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## 18.0 EMERGENCY PROCEDURES

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In the event of an emergency, all work will cease and equipment will be shut down. The onsite foreman and onsite supervisor/project manager will be equipped with an operating mobile phone at all times, and will contact 911 immediately in the event of an emergency etc.

The EAR office will be notified immediately in the event of an emergency/accident. In full compliance with the OSHA requirements for recording and reporting injuries and illnesses, EAR shall utilize the Accident/Incident Report (attached as Appendix E), which shall serve as Form 301. Within two working days of any reportable accident, EAR will prepare and submit an Accident/Incident Report to NYSDEC.

### 18.1 INJURY OR MEDICAL EMERGENCY

In the event of injury or medical emergency the following procedures will be implemented:

- The local Emergency Medical Response Team (EMRT) and police will be notified of the situation via the 911 system.
- Personnel will render first aid within the limits of their training. One person will remain with the injured party at all times unless required to call the EMRT.
- After the EMRT arrives they will be notified of all pertinent site information, including nature of contaminants known or suspected to be on site and all information relating to the nature of the injury.
- The health and safety officer, the project manager, and the office of EAR will be notified as soon as possible.
- Employee interviews, at the appropriate time, to determine cause factor(s); both the injured party and witnesses shall be interviewed utilizing the attached form to determine preventability. Should faulty equipment or tools be a cause factor in the incident, then the foreman shall take immediate action by removing this equipment or tools from service (either for repairs or to be discarded). Should the unsafe action of an individual or individuals be the cause, then the supervisor has the authority to either discipline or arrange for retraining.

First aid kits, eyewash, and fire extinguishers are available in all EAR vehicles.

The emergency procedures for chemical exposure will be as follows:

- ◆ Skin Contact - Flush with copious amounts of soap and potable water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention. Eyes should be flushed thoroughly with water in the event of chemical contact.
- ◆ Inhalation - Move victim to fresh air, if necessary decontaminate and transport to hospital.
- ◆ Ingestion - Decontaminate and transport to hospital.
- ◆ Puncture Wound or Laceration - Decontaminate and transport to hospital. Health and safety officer will supply medical data sheet to medical personnel as requested. First aid kits are located in all company vehicles.

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## 19.0 EMERGENCY PHONE NUMBERS

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### 19.1 GENERAL

- ◆ Fire Department: **911**
- ◆ Police Department: **911**
- ◆ Ambulance: **911**
- ◆ Poison Control Center: **(212) 340-4494**
- ◆ Chemtrec: **800-424-9300**
- ◆ New York City and Long Island One Call System: **1-800-272-4480 (or 811)**

### 19.2 ENVIRONMENTAL ASSESSMENT & REMEDIATIONS

**24-Hour Contact:** **1-888-EAR-6789 (option-2 for emergency)**

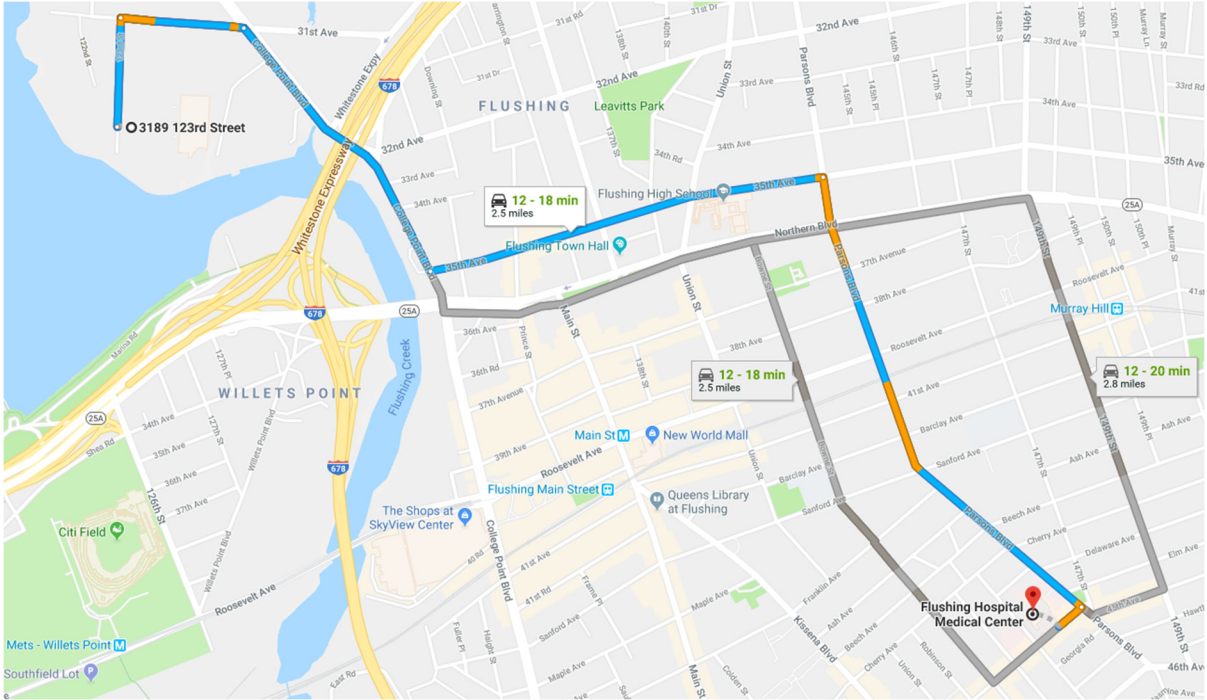
- ◆ David Vigliotta (Owner, President) (24 hour on-call for emergencies via above number)  
Work: **(631) 447-6400x120**  
Home: **no land based line available**  
Cell: **(632) 872-2824**
- ◆ John Hofmann (Health & Safety Officer) (24 hour on-call for emergencies via above number)  
Work: **(631) 447-6400 x113**  
Home: **(631) 475-7206**  
Cell: **(516) 924-1382**
- ◆ Jaime Allen (Project Manager)  
Work: **(631) 447-6400 x153**  
Home: **no land-based line available**  
Cell: **(631)504-2278**
- ◆ Stephen Goetz (Geologist/Foreman/Onsite Project Coordinator)  
Work: **(631) 447-6400 x152**  
Home: **no land-based line available**  
Cell: **(631) 572-4405**

### 19.3 NYSDEC REPRESENTATIVE

- ◆ Michael Haggerty (Project Manager)  
Work: **(518) 402-9688**

## 20.0 HOSPITAL INFORMATION

The nearest hospital to the Site is the Flushing Hospital and Medical Center at 4500 Parsons Blvd, Flushing, NY. The phone number for the hospital is (718) 670-5000. A map and directions to the hospital from the site are provided below.



### 3189 123rd Street, Flushing, NY

- ↑ Head north on 123rd St toward 31st Ave  
0.1 mi
  - ↗ Turn right onto 31st Ave  
0.2 mi
  - ↗ Turn right onto College Point Blvd  
0.6 mi
  - ↖ Turn left toward Northern Blvd  
0.2 mi
  - ↑ Continue straight onto Northern Blvd  
0.4 mi
  - ↗ Turn right onto Bowne St  
0.8 mi
  - ↖ Turn left onto 45th Ave  
0.1 mi
- Destination will be on the left**

### Flushing Hospital Medical Center

4500 Parsons Blvd, Flushing, NY 11355

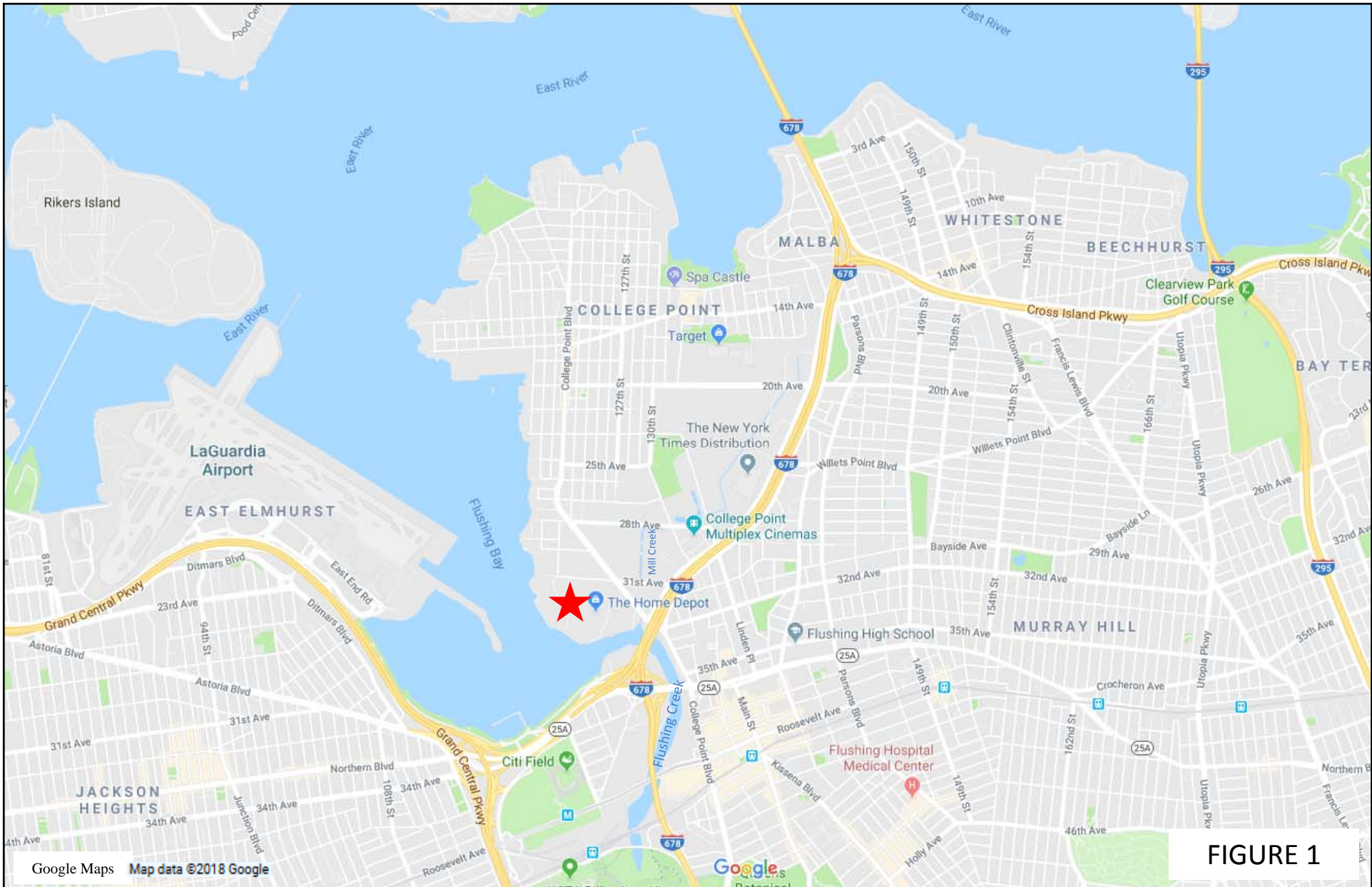
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## FIGURES

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**FIGURE 1: SITE LOCATION MAP**

**FIGURE 2: SITE PLAN**



**FIGURE 1**






**ENVIRONMENTAL  
ASSESSMENT &  
REMEDIATIONS**

## SITE LOCATION MAP

College Point Oil Lagoon  
123<sup>rd</sup> Street & 31<sup>st</sup> Avenue  
College Point, NY  
NYSDEC Site# 241001



Figure 2

Legend	
	2004/2005 Monitoring Well
	Proposed Soil Boring
	Proposed Vapor Monitoring Point

0 60  
 SCALE IN FEET



ENVIRONMENTAL  
 ASSESSMENT &  
 REMEDIATIONS

Site Map with  
 Proposed Drilling Locations

College Point Oil Lagoon  
 123rd Street and 31st Avenue  
 College Point, NY  
 NYSDEC Site #241001



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**APPENDIX A: JOB SAFETY CHECKLIST AND PPE HAZARD ASSESSMENT FORMS**

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## Job Safety Checklist



Date: \_\_\_\_\_

Site ID/Project Location: \_\_\_\_\_

EAR Representative: \_\_\_\_\_

The following procedures must be discussed as part of the Job Site Safety meeting with "Yes" signifying the workers are fully aware of the procedure and responsibilities and will communicate the procedures to everyone involved in the work (fellow employees, subcontractors, vendors, etc.) and ensure compliance. Work will not be allowed to progress in any area marked "N/A" or "No".

Procedure	Yes	No	N/A	Comments
Excavations				
Flexible Connector Removal				
Filter Changing				
Fire Protection				
Forklift Safety				
Hazardous Waste Manifests				
Ladder Safety				
Lifting & Carrying				
Lockout/Tagout				
Hazard Communication/MSDS				
Safety Meetings				
Safety Procedures for Interior Renovations				
Security - Contractor				
Spill Reporting & Response				
Tank Removal				
Contractor Safety Performance Selection Criteria & Enforcement Actions				
Bucket Truck (Aerial Lift) Safety				
Dispenser Transportation and Disposal				

**PPE Hazard Assessment Form**



Job Task: \_\_\_\_\_

Date: \_\_\_\_\_ Site ID/Project Location: \_\_\_\_\_

Assessed By: \_\_\_\_\_ Job Title: \_\_\_\_\_

**Potential Hazards:** (Check all that apply to either existing conditions or are a result of site operations)

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Rotating Machinery         | <input type="checkbox"/> Projectiles                             | <input type="checkbox"/> Confined Space              |
| <input type="checkbox"/> Heat Stress                | <input type="checkbox"/> Physical Exertion                       | <input type="checkbox"/> Biological                  |
| <input type="checkbox"/> Cold Stress                | <input type="checkbox"/> Noise (>90dBA)                          | <input type="checkbox"/> Electrical (Utilities)      |
| <input type="checkbox"/> Heavy Equipment            | <input type="checkbox"/> Vehicle Traffic                         | <input type="checkbox"/> Chemical Exposure           |
| <input type="checkbox"/> Intrusive Activity         | <input type="checkbox"/> Fire/Explosion                          | <input type="checkbox"/> Other: Slips, Trips & Falls |
| <input type="checkbox"/> Trench/Excavation Collapse | <input type="checkbox"/> Uneven Terrain                          | <input type="checkbox"/> Flammable Materials         |
| <input type="checkbox"/> Other: _____               | <input type="checkbox"/> Contact with Contaminated Soil or Water |  |

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Control or Protective Measures:** (check all that apply)

- |  |                                       |  |
|--|---------------------------------------|--|
| <input type="checkbox"/> Tailgate Meetings             | <input type="checkbox"/> PPE          | <input type="checkbox"/> Safe Work Practices |
| <input type="checkbox"/> Employee or Operator Training | <input type="checkbox"/> Site control | <input type="checkbox"/> Decontamination     |
| <input type="checkbox"/> Engineering Controls:         | <input type="checkbox"/> Other: _____ |  |

Install caution tape/barriers around operation.  
Establish sufficient work space and minimize access.

**Initial Level of PPE for Assigned Tasks**



PPE has been assigned for this work task per the potential for exposure. PPE requirements are outlined below.

PPE may be upgraded or downgraded depending on monitoring data, site conditions, or as determined by qualified personnel.

**Respirator:**         Not Required

- SCBA, Airline             Fullface APR Resp.         1/2 Face APR Resp.  
 N95 Dust Mask             OV/AG/HEPA Cart.         Other Cartridge: \_\_\_\_\_

**Protective Clothing:**

- Safety Vest                 Tyvek                         Poly Coated Tyvek  
 Saranex                     Splash Suit                 Encapsulating Suit  
 Other: \_\_\_\_\_         Standard Field Clothing

**Gloves:**                 Not Required

- Nitrile                       Neoprene                     PVC - Use with Petroleum Products  
 Vinyl                         Leather                       Other: \_\_\_\_\_

**Head/Eye/Ear:**         Not Required

- Hard Hat                     Safety Glasses               Goggles                       Welding Shield  
 Splash Shield               Ear Plugs/Muffs             Other: \_\_\_\_\_

**Footwear:**              Not Required

- Leather Work Boots         Safety Toed Leather         Chemical Overboots  
 Safety Toed Rubber         Other: \_\_\_\_\_

**Other PPE:**

- \_\_\_\_\_  
 \_\_\_\_\_

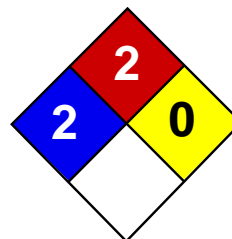
\_\_\_\_\_  
Signature of the person that performed the assessment

\_\_\_\_\_  
Date of assessment

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**APPENDIX B: SAFETY DATA SHEETS**

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Health	2
Fire	2
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet

### 1,2-Dichlorobenzene MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** 1,2-Dichlorobenzene

**Catalog Codes:** SLD2728

**CAS#:** 95-50-1

**RTECS:** CZ4500000

**TSCA:** TSCA 8(b) inventory: 1,2-Dichlorobenzene

**CI#:** Not available.

**Synonym:**

**Chemical Name:** Not available.

**Chemical Formula:** C<sub>6</sub>H<sub>4</sub>Cl<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{1,2-}Dichlorobenzene	95-50-1	100

**Toxicological Data on Ingredients:** 1,2-Dichlorobenzene: ORAL (LD50): Acute: 500 mg/kg [Rat]. 500 mg/kg [Rabbit].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Hazardous in case of skin contact (permeator), of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Hazardous in case of skin contact (permeator), of inhalation. **CARCINOGENIC EFFECTS:** Not available. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance is toxic to kidneys, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Combustible.

**Auto-Ignition Temperature:** 648°C (1198.4°F)

**Flash Points:** CLOSED CUP: 66°C (150.8°F). OPEN CUP: 68°C (154.4°F).

**Flammable Limits:** LOWER: 2.2% UPPER: 9.2%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>), halogenated compounds.

**Fire Hazards in Presence of Various Substances:** Slightly flammable to flammable in presence of oxidizing materials.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive to explosive in presence of oxidizing materials.

**Fire Fighting Media and Instructions:**

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Combustible material. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

**Storage:**

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 50 (ppm) TWA: 300 (mg/m<sup>3</sup>) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Pleasant.

**Taste:** Not available.

**Molecular Weight:** 147 g/mole

**Color:** Colorless to light yellow.

**pH (1% soln/water):** Not available.

**Boiling Point:** 180°C (356°F)

**Melting Point:** -17.6°C (0.3°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.3059 (Water = 1)

**Vapor Pressure:** 1.2 mm of Hg (@ 20°C)

**Vapor Density:** 5.07 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 2 ppm

**Water/Oil Dist. Coeff.:** The product is equally soluble in oil and water; log(oil/water) = 0

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Very slightly soluble in cold water.



## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD50): 500 mg/kg [Rabbit].

**Chronic Effects on Humans:** The substance is toxic to kidneys, liver, mucous membranes.

**Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (irritant), of ingestion. Hazardous in case of skin contact (permeator), of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** CLASS 6.1: Poisonous material.

**Identification:** : o-Dichlorobenzene : UN1591 PG: III

**Special Provisions for Transport:** Marine Pollutant

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: 1,2-Dichlorobenzene Massachusetts RTK: 1,2-Dichlorobenzene TSCA 8(b) inventory: 1,2-Dichlorobenzene SARA 313 toxic chemical notification and release reporting: 1,2-Dichlorobenzene CERCLA: Hazardous substances.: 1,2-Dichlorobenzene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

#### DSCL (EEC):

R38- Irritating to skin. R41- Risk of serious damage to eyes.

#### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 2

**Reactivity:** 0

**Personal Protection:** h

#### National Fire Protection Association (U.S.A.):

**Health:** 2

**Flammability:** 2

**Reactivity:** 0

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

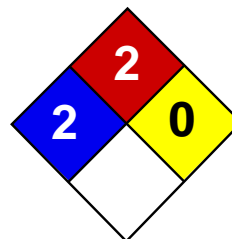
**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:07 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	2
Fire	2
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet

### 1,4-Dichlorobenzene MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** 1,4-Dichlorobenzene

**Catalog Codes:** SLD4093

**CAS#:** 106-46-7

**RTECS:** CZ4550000

**TSCA:** TSCA 8(b) inventory: 1,4-Dichlorobenzene

**CI#:** Not available.

**Synonym:**

**Chemical Formula:** C<sub>6</sub>H<sub>4</sub>Cl<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{1,4-}Dichlorobenzene	106-46-7	100

**Toxicological Data on Ingredients:** 1,4-Dichlorobenzene: ORAL (LD50): Acute: 500 mg/kg [Rat]. DERMAL (LD50): Acute: 6000 mg/kg [Rabbit].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Very hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH. Classified 2 (Reasonably anticipated.) by NTP. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance is toxic to kidneys, lungs, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** 413°C (775.4°F)

**Flash Points:** CLOSED CUP: 65.56°C (150°F). (TAG)

**Flammable Limits:** LOWER: 2.5% UPPER: 16%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>), halogenated compounds.

**Fire Hazards in Presence of Various Substances:** Slightly flammable to flammable in presence of oxidizing materials.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive to explosive in presence of oxidizing materials.

**Fire Fighting Media and Instructions:**

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**

Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

**Storage:**

Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:**

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 75 CEIL: 110 (ppm) TWA: 450 CEIL: 675 (mg/m<sup>3</sup>) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 147 g/mole

**Color:** Not available.

**pH (1% soln/water):** Not available.

**Boiling Point:** 174.12°C (345.4°F)

**Melting Point:** 53.75°C (128.8°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.46 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** 5.08 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 15 ppm

**Water/Oil Dist. Coeff.:** The product is equally soluble in oil and water; log(oil/water) = 0

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether, acetone.

**Solubility:**

Soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold water.

**Section 10: Stability and Reactivity Data**

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

**Section 11: Toxicological Information**

**Routes of Entry:** Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

Acute oral toxicity (LD50): 500 mg/kg [Rat]. Acute dermal toxicity (LD50): 6000 mg/kg [Rabbit].

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2 (Reasonably anticipated.) by NTP. The substance is toxic to kidneys, lungs, liver, mucous membranes.

**Other Toxic Effects on Humans:** Very hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

**Section 12: Ecological Information**

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

**Section 13: Disposal Considerations**

**Waste Disposal:**

**Section 14: Transport Information**

**DOT Classification:** CLASS 9: Miscellaneous hazardous material.

**Identification:** : Environmentally hazardous substance, solid, n.o.s. (p-Dichlorobenzene) : UN3077 PG: III

**Special Provisions for Transport:** Marine Pollutant

## Section 15: Other Regulatory Information

### Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: 1,4-Dichlorobenzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: 1,4-Dichlorobenzene Pennsylvania RTK: 1,4-Dichlorobenzene Massachusetts RTK: 1,4-Dichlorobenzene TSCA 8(b) inventory: 1,4-Dichlorobenzene SARA 313 toxic chemical notification and release reporting: 1,4-Dichlorobenzene CERCLA: Hazardous substances.: 1,4-Dichlorobenzene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

#### DSCL (EEC):

R38- Irritating to skin. R41- Risk of serious damage to eyes. R45- May cause cancer.

#### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 2

**Reactivity:** 0

**Personal Protection:** E

#### National Fire Protection Association (U.S.A.):

**Health:** 2

**Flammability:** 2

**Reactivity:** 0

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:07 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet Acetone MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Acetone

**Catalog Codes:** SLA3502, SLA1645, SLA3151, SLA3808

**CAS#:** 67-64-1

**RTECS:** AL3150000

**TSCA:** TSCA 8(b) inventory: Acetone

**CI#:** Not applicable.

**Synonym:** 2-propanone; Dimethyl Ketone; Dimethylformaldehyde; Pyroacetic Acid

**Chemical Name:** Acetone

**Chemical Formula:** C<sub>3</sub>H<sub>6</sub>O

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Acetone	67-64-1	100

**Toxicological Data on Ingredients:** Acetone: ORAL (LD50): Acute: 5800 mg/kg [Rat]. 3000 mg/kg [Mouse]. 5340 mg/kg [Rabbit]. VAPOR (LC50): Acute: 50100 mg/m 8 hours [Rat]. 44000 mg/m 4 hours [Mouse].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. The substance is toxic to central nervous system (CNS). The substance may be toxic to kidneys, the reproductive system, liver, skin. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 465°C (869°F)

**Flash Points:** CLOSED CUP: -20°C (-4°F). OPEN CUP: -9°C (15.8°F) (Cleveland).

**Flammable Limits:** LOWER: 2.6% UPPER: 12.8%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of oxidizing materials, of acids.

**Fire Fighting Media and Instructions:**

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:** Vapor may travel considerable distance to source of ignition and flash back.

**Special Remarks on Explosion Hazards:**

Forms explosive mixtures with hydrogen peroxide, acetic acid, nitric acid, nitric acid + sulfuric acid, chromic anhydride, chromyl chloride, nitrosyl chloride, hexachloromelamine, nitrosyl perchlorate, nitryl perchlorate, permonosulfuric acid, thiodiglycol + hydrogen peroxide, potassium ter-butoxide, sulfur dichloride, 1-methyl-1,3-butadiene, bromoform, carbon, air, chloroform, thitriazylperchlorate.

## Section 6: Accidental Release Measures

**Small Spill:**

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill:**

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Section 7: Handling and Storage****Precautions:**

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, acids, alkalis.

**Storage:**

Store in a segregated and approved area (flammables area) . Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Keep away from direct sunlight and heat and avoid all possible sources of ignition (spark or flame).

**Section 8: Exposure Controls/Personal Protection****Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 500 STEL: 750 (ppm) from ACGIH (TLV) [United States] TWA: 750 STEL: 1000 (ppm) from OSHA (PEL) [United States] TWA: 500 STEL: 1000 [Australia] TWA: 1185 STEL: 2375 (mg/m3) [Australia] TWA: 750 STEL: 1500 (ppm) [United Kingdom (UK)] TWA: 1810 STEL: 3620 (mg/m3) [United Kingdom (UK)] TWA: 1800 STEL: 2400 from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

**Section 9: Physical and Chemical Properties**

**Physical state and appearance:** Liquid.

**Odor:** Fruity. Mint-like. Fragrant. Ethereal

**Taste:** Pungent, Sweetish

**Molecular Weight:** 58.08 g/mole

**Color:** Colorless. Clear

**pH (1% soln/water):** Not available.

**Boiling Point:** 56.2°C (133.2°F)

**Melting Point:** -95.35 (-139.6°F)

**Critical Temperature:** 235°C (455°F)

**Specific Gravity:** 0.79 (Water = 1)

**Vapor Pressure:** 24 kPa (@ 20°C)

**Vapor Density:** 2 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 62 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in water;  $\log(\text{oil/water}) = -0.2$

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water.

**Solubility:** Easily soluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Excess heat, ignition sources, exposure to moisture, air, or water, incompatible materials.

**Incompatibility with various substances:** Reactive with oxidizing agents, reducing agents, acids, alkalis.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

### Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3000 mg/kg [Mouse]. Acute toxicity of the vapor (LC50): 44000 mg/m<sup>3</sup> 4 hours [Mouse].

### Chronic Effects on Humans:

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [SUSPECTED]. Causes damage to the following organs: central nervous system (CNS). May cause damage to the following organs: kidneys, the reproductive system, liver, skin.

### Other Toxic Effects on Humans:

Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:** Not available.

### Special Remarks on Chronic Effects on Humans:

May affect genetic material (mutagenicity) based on studies with yeast (*S. cerevisiae*), bacteria, and hamster fibroblast cells. May cause reproductive effects (fertility) based upon animal studies. May contain trace amounts of benzene and formaldehyde which may cancer and birth defects. Human: passes the placental barrier.

### Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: May cause skin irritation. May be harmful if absorbed through the skin. Eyes: Causes eye irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. Inhalation: Inhalation at high concentrations affects the sense organs, brain and causes respiratory tract irritation. It also may affect the Central Nervous System (behavior) characterized by dizziness, drowsiness, confusion, headache, muscle weakness, and possibly motor incoordination, speech abnormalities, narcotic effects and coma. Inhalation may also affect the gastrointestinal tract (nausea, vomiting). Ingestion: May cause irritation of the digestive (gastrointestinal) tract (nausea, vomiting). It may also

affect the Central Nervous System (behavior), characterized by depression, fatigue, excitement, stupor, coma, headache, altered sleep time, ataxia, tremors as well as the blood, liver, and urinary system (kidney, bladder, ureter) and endocrine system. May also have musculoskeletal effects. Chronic Potential Health Effects: Skin: May cause dermatitis. Eyes: Eye irritation.

## Section 12: Ecological Information

### Ecotoxicity:

Ecotoxicity in water (LC50): 5540 mg/l 96 hours [Trout]. 8300 mg/l 96 hours [Bluegill]. 7500 mg/l 96 hours [Fathead Minnow]. 0.1 ppm any hours [Water flea].

**BOD5 and COD:** Not available.

### Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

### Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Acetone UNNA: 1090 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Benzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Benzene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Benzene, Formaldehyde Connecticut hazardous material survey.: Acetone Illinois toxic substances disclosure to employee act: Acetone Illinois chemical safety act: Acetone New York release reporting list: Acetone Rhode Island RTK hazardous substances: Acetone Pennsylvania RTK: Acetone Florida: Acetone Minnesota: Acetone Massachusetts RTK: Acetone Massachusetts spill list: Acetone New Jersey: Acetone New Jersey spill list: Acetone Louisiana spill reporting: Acetone California List of Hazardous Substances (8 CCR 339): Acetone TSCA 8(b) inventory: Acetone TSCA 4(a) final test rules: Acetone TSCA 8(a) IUR: Acetone

### Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

### Other Classifications:

### WHMIS (Canada):

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**

R11- Highly flammable. R36- Irritating to eyes. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 1

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

**Section 16: Other Information****References:**

-Material safety data sheet issued by: la Commission de la Santé et de la Sécurité du Travail du Québec. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. LOLI, RTECS, HSDB databases. Other MSDSs

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:13 PM

**Last Updated:** 05/21/2013 12:00 PM

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

Product Name : Benzene  
Material : 1098293, 1059192, 1059060, 1037212, 1037213, 1037103,  
1029170, 1037104, 1015526, 1016960

**Company** : Chevron Phillips Chemical Company LP  
10001 Six Pines Drive  
The Woodlands, TX 77380

**Emergency telephone:****Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

**Transport:**

CHEMTREC 1.800.424.9300 (within USA and Canada) or 703.527.3887 (outside USA and Canada)

Asia: +800 CHEMCALL (+800 2436 2255) China: +86-21-22157316

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group  
E-mail address : SDS@CPChem.com  
Website : www.CPChem.com

**SECTION 2: Hazards identification****Classification of the substance or mixture**

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

**Emergency Overview****Danger****Physical state:** Liquid    **Color:** Clear, Colorless    **Odor:** sweet, distinct

OSHA Hazards : Flammable Liquid, Aspiration hazard, Carcinogen, Moderate skin irritant, Moderate eye irritant, Mutagen, Target Organ Effects

**Classification**

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- : Flammable liquids , Category 2
- Skin irritation , Category 2
- Eye irritation , Category 2A
- Germ cell mutagenicity , Category 1B
- Carcinogenicity , Category 1A
- Specific target organ systemic toxicity - repeated exposure , Category 1 , Blood
- Aspiration hazard , Category 1

**Labeling**

Symbol(s)



Signal Word

: Danger

Hazard Statements

- : H225: Highly flammable liquid and vapor.
- H304: May be fatal if swallowed and enters airways.
- H315: Causes skin irritation.
- H319: Causes serious eye irritation.
- H340: May cause genetic defects.
- H350: May cause cancer.
- H372: Causes damage to organs (Blood) through prolonged or repeated exposure.

Precautionary Statements

- : **Prevention:**
- 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.
- P233 Keep container tightly closed.
- P240 Ground/bond container and receiving equipment.
- P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
- P242 Use only non-sparking tools.
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe dust/fume/gas/mist/vapor/spray.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/ eye protection/ face protection.
- P281 Use personal protective equipment as required.
- Response:**
- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
- P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308 + P313 IF exposed or concerned: Get medical advice/ attention.
- P331 Do NOT induce vomiting.
- P332 + P313 If skin irritation occurs: Get medical advice/ attention.
- P337 + P313 If eye irritation persists: Get medical advice/



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attention.

P362 Take off contaminated clothing and wash before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

**Storage:**

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

**Disposal:**

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

**Carcinogenicity:****IARC**

Group 1: Carcinogenic to humans

Benzene 71-43-2

**NTP**

Known to be human carcinogen

Benzene 71-43-2

**ACGIH**

Confirmed human carcinogen

Benzene 71-43-2

**SECTION 3: Composition/information on ingredients**

Synonyms : Aromatic Benzene  
Benzol  
Cyclohexatriene  
Phene  
Phenyl Hydride

Molecular formula : C<sub>6</sub>H<sub>6</sub>

Component	CAS-No.	Weight %
Benzene	71-43-2	100

**SECTION 4: First aid measures**

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled : If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.

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Take victim immediately to hospital.

**SECTION 5: Firefighting measures**

Flash point	:	-11 °C (12 °F) Method: Tag closed cup
Autoignition temperature	:	498 °C (928 °F)
Suitable extinguishing media	:	Alcohol-resistant foam. Carbon dioxide (CO <sub>2</sub> ). Dry chemical.
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	No data available.

**SECTION 6: Accidental release measures**

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

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**SECTION 7: Handling and storage****Handling**

Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. Review all operations, which have the potential to generating and accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106 "Flammable and Combustible Liquids"; National Fire Protection Association (NFPA 77), "Recommended Practice on Static Electricity"; and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of Static, Lightning, and stray Currents".

Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

**Storage**

Requirements for storage areas and containers : No smoking. 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. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

**SECTION 8: Exposure controls/personal protection****Ingredients with workplace control parameters**

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**US**

Ingredients	Basis	Value	Control parameters	Note
Benzene	ACGIH	TWA	0.5 ppm,	BEI, A1, Skin,
	ACGIH	STEL	2.5 ppm,	BEI, A1, Skin,
	OSHA Z-1-A	TWA	1 ppm,	
	OSHA Z-1-A	CEIL	5 ppm,	
	OSHA Z-2	Peak	50 ppm,	(a),
	OSHA 29 CFR 1910.1028(c)	TWA	1 ppm,	
	OSHA 29 CFR 1910.1028(c)	STEL	5 ppm,	
	OSHA CARC	PEL	1 ppm,	
	OSHA CARC	STEL	5 ppm,	

(a) This standard applies to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the benzene standard at 1910.1028.

A1 Confirmed human carcinogen

BEI Substances for which there is a Biological Exposure Index or Indices (see BEI® section)

Skin Danger of cutaneous absorption

**Immediately Dangerous to Life or Health Concentrations (IDLH)**

Substance name	CAS-No.	Control parameters	Update
Benzene	71-43-2	Immediately Dangerous to Life or Health Concentration Value 500 ppm	1995-03-01

**Engineering measures**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

**Personal protective equipment**

- Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.
- Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
- Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles.
- Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame retardant

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antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

**SECTION 9: Physical and chemical properties****Information on basic physical and chemical properties****Appearance**

Physical state : Liquid  
 Color : Clear, Colorless  
 Odor : sweet, distinct

**Safety data**

Flash point : -11 °C (12 °F)  
 Method: Tag closed cup

Lower explosion limit : 1.2 %(V)

Upper explosion limit : 7.8 %(V)

Oxidizing properties : no

Autoignition temperature : 498 °C (928 °F)

Molecular formula : C<sub>6</sub>H<sub>6</sub>

Molecular weight : 78.12 g/mol

pH : Not applicable

Pour point : No data available

Boiling point/boiling range : 80 °C (176 °F)

Vapor pressure : 75.00 MMHG  
 at 20 °C (68 °F)

Relative density : 0.88  
 at 25 °C (77 °F)

Water solubility : 1.88 g/l  
 at 23.5 °C (74.3 °F)

Partition coefficient: n-  
 octanol/water : log Pow: 2.13

Relative vapor density : 2.77  
 (Air = 1.0)

Evaporation rate : 2.8

Percent volatile : > 99 %

**Other information**

SDS Number:100000068511

7/14

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Conductivity : < 50 pSm  
at 20 °C

**SECTION 10: Stability and reactivity**

Reactivity : No decomposition if stored and applied as directed.

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.  
No decomposition if stored and applied as directed.

**Possibility of hazardous reactions**

Conditions to avoid : Heat, flames and sparks.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous decomposition products : No data available

Other data : No decomposition if stored and applied as directed.

**SECTION 11: Toxicological information****Acute oral toxicity**

Benzene : LD50: > 2,000 mg/kg  
Species: Rat  
Sex: female

**Acute inhalation toxicity**

Benzene : LC50: 44.5 mg/l  
Exposure time: 4 h  
Species: Rat  
Sex: Not Specified  
Test atmosphere: vapor

**Acute dermal toxicity**

Benzene : LD50: > 8,260 mg/kg  
Species: Rabbit

**Benzene**

**Skin irritation** : May cause skin irritation in susceptible persons.

**Benzene**

**Eye irritation** : May cause irreversible eye damage.

**Sensitization**

**Benzene**

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Benzene : Did not cause sensitization on laboratory animals.

**Repeated dose toxicity**

Benzene : Species: Rat, female  
Sex: female  
Application Route: oral gavage  
Dose: 0, 25, 50, 100 mg/kg  
Exposure time: 103 wk  
Number of exposures: 5 d/wk  
NOEL: < 25 mg/kg  
Lowest observable effect level: 25 mg/kg

Species: Rat, male  
Sex: male  
Application Route: oral gavage  
Dose: 0, 50, 100, 200 mg/kg  
Exposure time: 103 wk  
Number of exposures: 5 d/wk  
NOEL: < 50 mg/kg  
Lowest observable effect level: 50 mg/kg

Species: Mouse  
Application Route: oral gavage  
Dose: 0, 25, 50, 100 mg/kg  
Exposure time: 103 wk  
NOEL: < 25 mg/kg

**Carcinogenicity**

Benzene : Species: Rat  
Sex: female  
Dose: 0, 25, 50, 250 mg/kg  
Exposure time: 103 wks  
Number of exposures: daily, 5 days/week  
Test substance: yes  
Remarks: zymbal gland carcinomas, squamous cell papillomas

Species: Rat  
Sex: male  
Dose: 0, 50, 100, 200 mg/kg  
Exposure time: 103 wks  
Number of exposures: daily, 5 days/week  
Test substance: yes  
Remarks: zymbal gland carcinomas, squamous cell papillomas

Species: Mouse  
Sex: male and female  
Dose: 25, 50, 100 mg/kg  
Exposure time: 103 wks  
Number of exposures: daily, 5 days/week  
Test substance: yes  
Remarks: Clear evidence of multiple organ carcinogenicity.

**Benzene  
Aspiration toxicity** : May be fatal if swallowed and enters airways.

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Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

**CMR effects**

**Benzene** : Carcinogenicity: Human carcinogen.  
 Mutagenicity: In vivo tests showed mutagenic effects  
 Teratogenicity: Did not show teratogenic effects in animal experiments.  
 Reproductive toxicity: Animal testing did not show any effects on fertility.

**Benzene****Further information**

: Chronic Health Hazard.  
 Solvents may degrease the skin.

**SECTION 12: Ecological information****Toxicity to fish**

**Benzene** : LC50: 5.3 mg/l  
 Exposure time: 96 h  
 Species: Oncorhynchus mykiss (rainbow trout)  
 flow-through test Test substance: yes  
 Method: OECD Test Guideline 203

**Toxicity to daphnia and other aquatic invertebrates**

**Benzene** : EC50: 10 mg/l  
 Exposure time: 48 h  
 Species: Daphnia magna (Water flea)  
 static test Test substance: yes  
 Method: OECD Test Guideline 202

**Toxicity to algae**

**Benzene** : ErC50: 100 mg/l  
 Exposure time: 72 h  
 Species: Pseudokirchneriella subcapitata (green algae)  
 Test substance: yes  
 Method: OECD Test Guideline 201

Elimination information (persistence and degradability)

**Biodegradability** : This material is expected to be readily biodegradable.

**Ecotoxicology Assessment**

Acute aquatic toxicity

**Benzene** : Toxic to aquatic life.

Chronic aquatic toxicity

**Benzene** : Harmful to aquatic life with long lasting effects.



**Benzene**

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## Results of PBT assessment

Benzene : This substance is not considered to be persistent, bioaccumulating and toxic (PBT)., This substance is not considered to be very persistent and very bioaccumulating (vPvB).

## Additional ecological information

: Toxic to aquatic life.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life.

**SECTION 13: Disposal considerations**

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

Product : The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

**SECTION 14: Transport information**

**The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).**

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**  
UN1114, BENZENE, 3, II, RQ (BENZENE)

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**  
UN1114, BENZENE, 3, II, (-11 °C)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**  
UN1114, BENZENE, 3, II

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**

**Benzene**

Version 1.9

Revision Date 2016-01-08

UN1114, BENZENE, 3, II, (D/E)

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**

UN1114, BENZENE, 3, II

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**

UN1114, BENZENE, 3, II

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

<b>Other information</b>	<b>: Benzene and mixtures having 10% Benzene or more, S.T. 3, Cat.Y</b>
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**SECTION 15: Regulatory information****National legislation**

CERCLA Reportable Quantity : 10 lbs  
Benzene

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

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

: Benzene - 71-43-2

**Clean Air Act**

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

**Benzene**

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: Benzene - 71-43-2

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

: Benzene - 71-43-2

**US State Regulations**

Pennsylvania Right To Know

: Benzene - 71-43-2

New Jersey Right To Know

: Benzene - 71-43-2

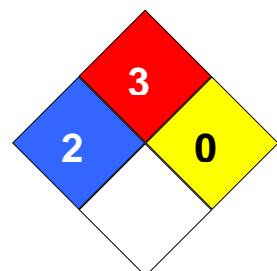
California Prop. 65  
Ingredients

: WARNING! This product contains a chemical known in the State of California to cause cancer.

WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

**Notification status**

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America TSCA	:	On the inventory, or in compliance with the inventory
Canada DSL	:	On the inventory, or in compliance with the inventory
Australia AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	On the inventory, or in compliance with the inventory
Japan ENCS	:	On the inventory, or in compliance with the inventory
Korea KECI	:	On the inventory, or in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory

**SECTION 16: Other information****NFPA Classification**: Health Hazard: 2  
Fire Hazard: 3  
Reactivity Hazard: 0

**Benzene**

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Revision Date 2016-01-08

**Further information**

Legacy SDS Number : CPC00091

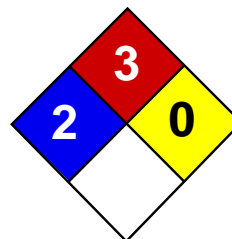
Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Key or legend to abbreviations and acronyms used in the safety data sheet**

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		



Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet Chlorobenzene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Chlorobenzene

**Catalog Codes:** SLC1654

**CAS#:** 108-90-7

**RTECS:** CZ0175000

**TSCA:** TSCA 8(b) inventory: Chlorobenzene

**CI#:** Not available.

**Synonym:** Monochlorobenzene

**Chemical Name:** Not available.

**Chemical Formula:** C<sub>6</sub>H<sub>5</sub>Cl

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Chlorobenzene	108-90-7	100

**Toxicological Data on Ingredients:** Chlorobenzene: ORAL (LD50): Acute: 1110 mg/kg [Rat]. 2300 mg/kg [Mouse].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, sensitizer, permeator). Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, sensitizer, permeator). **CARCINOGENIC EFFECTS:** Not available. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance is toxic to kidneys, lungs, the nervous system, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 638°C (1180.4°F)

**Flash Points:** CLOSED CUP: 29.44°C (85°F).

**Flammable Limits:** LOWER: 1.3% UPPER: 7.1%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

### Storage:

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 10 (ppm) TWA: 46 (mg/m<sup>3</sup>) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Almond-like.

**Taste:** Not available.

**Molecular Weight:** 112.56 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 132°C (269.6°F)

**Melting Point:** -45.6°C (-50.1°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.1058 (Water = 1)

**Vapor Pressure:** 8.8 mm of Hg (@ 20°C)

**Vapor Density:** 3.88 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.2 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether.

**Solubility:**

Soluble in methanol, diethyl ether. Very slightly soluble in cold water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Not available.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

### Section 11: Toxicological Information

**Routes of Entry:** Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD50): 1110 mg/kg [Rat].

**Chronic Effects on Humans:** The substance is toxic to kidneys, lungs, the nervous system, liver, mucous membranes.

**Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, sensitizer, permeator).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information



**DOT Classification:** Class 3: Flammable liquid.

**Identification:** : Chlorobenzene : UN1134 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: Chlorobenzene Massachusetts RTK: Chlorobenzene TSCA 8(b) inventory: Chlorobenzene SARA 313 toxic chemical notification and release reporting: Chlorobenzene CERCLA: Hazardous substances.: Chlorobenzene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

#### DSCL (EEC):

R10- Flammable. R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes. R43- May cause sensitization by skin contact.

#### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

#### National Fire Protection Association (U.S.A.):

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

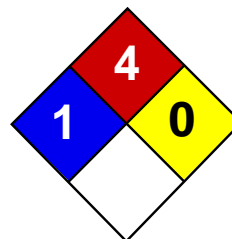
**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:16 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	1
Fire	4
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet

### Ethyl chloride MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Ethyl chloride

**Catalog Codes:** SLE1957

**CAS#:** 75-00-3

**RTECS:** KH7525000

**TSCA:** TSCA 8(b) inventory: Ethyl chloride

**CI#:** Not available.

**Synonym:** Chloroethane

**Chemical Formula:** C<sub>2</sub>H<sub>5</sub>Cl

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Ethyl chloride	75-00-3	100

**Toxicological Data on Ingredients:** Ethyl chloride: GAS (LC50): Acute: 80 ppm 4 hour(s) [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Extremely hazardous in case of inhalation. Very hazardous in case of eye contact (irritant). Slightly hazardous in case of skin contact (irritant), of ingestion. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching.

**Potential Chronic Health Effects:**

Extremely hazardous in case of inhalation. Very hazardous in case of eye contact (irritant). Slightly hazardous in case of skin contact (irritant), of ingestion. **CARCINOGENIC EFFECTS:** Not available. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance is toxic to blood, kidneys, lungs, the nervous system, liver, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:** Not available.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**

If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. Evacuate the victim to a safe area as soon as possible. If the victim is breathing, check for unusual breath odors. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Maintain an open airway. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

Since the product is a gas and that it is mostly probable that it will be inhaled more than ingested, please consider first to look at the preventive measures in case of inhalation.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 519°C (966.2°F)

**Flash Points:** CLOSED CUP: -50°C (-58°F). OPEN CUP: -43°C (-45.4°F).

**Flammable Limits:** LOWER: 3.6% UPPER: 15.4%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Toxic gas. Flammable gas. **SMALL FIRE:** Use DRY chemical powder. **LARGE FIRE:** Use water spray, fog or foam. Do not use water jet. Move containing vessels from fire area if without risk. Cool containing vessels with flooding quantities of water until well after fire is out. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Do not extinguish a leaking gas flame unless leak can be stopped. Extinguish secondary fire. Handle damaged cylinders with extreme care. Use extinguishing media suitable for surrounding materials.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Try to stop the gaseous leak by taping the container with an appropriate material (tape, stretched plastic).

**Large Spill:**

Toxic gas. Flammable gas. Let evaporate. If possible, turn leaking container so that gas escapes rather than liquid. Do not touch spilled material. Do not direct water at spill or source. Use water spray curtain to divert vapor drift. Use water spray to

reduce vapors. Prevent entry into sewers, basements or confined areas. Eliminate all ignition sources. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Avoid contact with eyes In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible. Keep container tightly closed and in a well-ventilated place.

**Storage:** Compressed gases should be stored in a separate safety storage cabinet or room.

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:** Ventilation is normally required when handling or using this product.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 1000 (ppm) TWA: 2600 (mg/m<sup>3</sup>) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Gas.

**Odor:** Ethereal.

**Taste:** Burning.

**Molecular Weight:** 64.51 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 12.3°C (54.1°F)

**Melting Point:** -138.7°C (-217.7°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.9 (Water = 1)

**Vapor Pressure:** 1064 mm of Hg (@ 20°C)

**Vapor Density:** 2.22 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 4.2 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Very slightly soluble in cold water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

### Section 11: Toxicological Information

**Routes of Entry:** Eye contact. Inhalation.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute toxicity of the gas (LC50): 80 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:** The substance is toxic to blood, kidneys, lungs, the nervous system, liver, mucous membranes.

**Other Toxic Effects on Humans:**

Extremely hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant), of ingestion.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information

**DOT Classification:** CLASS 2.1: Flammable gas.

**Identification:** : Ethyl chloride : UN1037 PG: Not available.

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Ethyl chloride California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Ethyl chloride Pennsylvania RTK: Ethyl chloride Massachusetts RTK: Ethyl chloride TSCA 8(b) inventory: Ethyl chloride SARA 313 toxic chemical notification and release reporting: Ethyl chloride CERCLA: Hazardous substances.: Ethyl chloride

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS A: Compressed gas. CLASS B-1: Flammable gas.

#### DSCL (EEC):

R26- Very toxic by inhalation. R41- Risk of serious damage to eyes.

#### HMIS (U.S.A.):

**Health Hazard:** 1

**Fire Hazard:** 4

**Reactivity:** 0

**Personal Protection:** h

#### National Fire Protection Association (U.S.A.):

**Health:** 1

**Flammability:** 4

**Reactivity:** 0

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:29 PM

**Last Updated:** 05/21/2013 12:00 PM

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# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**MATHESON TRI-GAS, INC.**  
**150 Allen Road Suite 302**  
**Basking Ridge, New Jersey 07920**  
**Information: 1-800-416-2505**

**Emergency Contact:**  
**CHEMTREC 1-800-424-9300**  
**Calls Originating Outside the US:**  
**703-527-3887 (Collect Calls Accepted)**

**SUBSTANCE: ETHYL BENZENE**

**TRADE NAMES/SYNONYMS:**

MTG MSDS 185; BENZENE, ETHYL-; EB; PHENYLETHANE; ETHYLBENZENE; ETHYLBENZOL;  
ALPHA-METHYLTOLUENE; UN 1175; C8H10; MAT08780

**CHEMICAL FAMILY:** hydrocarbons, aromatic

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 11 2008

## 2. COMPOSITION, INFORMATION ON INGREDIENTS

**COMPONENT:** ETHYL BENZENE  
**CAS NUMBER:** 100-41-4  
**PERCENTAGE:** 100

## 3. HAZARDS IDENTIFICATION

**NFPA RATINGS (SCALE 0-4):** HEALTH=3 FIRE=3 REACTIVITY=0



**EMERGENCY OVERVIEW:**

**COLOR:** colorless

**PHYSICAL FORM:** liquid

**ODOR:** aromatic odor

**MAJOR HEALTH HAZARDS:** respiratory tract irritation, skin irritation, eye irritation, aspiration hazard, central nervous system depression, suspect cancer hazard (in animals)

**PHYSICAL HAZARDS:** Flammable liquid and vapor. Vapor may cause flash fire.

**POTENTIAL HEALTH EFFECTS:**

**INHALATION:**

**SHORT TERM EXPOSURE:** irritation (possibly severe), chest pain, difficulty breathing, headache,

drowsiness, dizziness, loss of coordination, coma

**LONG TERM EXPOSURE:** irritation, headache, drowsiness, emotional disturbances, cancer

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** irritation (possibly severe)

**LONG TERM EXPOSURE:** irritation

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** irritation (possibly severe)

**LONG TERM EXPOSURE:** irritation

**INGESTION:**

**SHORT TERM EXPOSURE:** nausea, vomiting, stomach pain, aspiration hazard

**LONG TERM EXPOSURE:** no information on significant adverse effects

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## 4. FIRST AID MEASURES

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**SKIN CONTACT:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

**EYE CONTACT:** Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**INGESTION:** Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

**NOTE TO PHYSICIAN:** For inhalation, consider oxygen. For ingestion, consider gastric lavage and activated charcoal slurry.

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## 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Severe fire hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

**EXTINGUISHING MEDIA:** regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool



containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Water may be ineffective.

**FLASH POINT:** 59 F (15 C) (CC)

**LOWER FLAMMABLE LIMIT:** 0.8%

**UPPER FLAMMABLE LIMIT:** 6.7%

**AUTOIGNITION:** 810 F (432 C)

**FLAMMABILITY CLASS (OSHA):** IB

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## 6. ACCIDENTAL RELEASE MEASURES

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### **AIR RELEASE:**

Reduce vapors with water spray. Stay upwind and keep out of low areas.

### **SOIL RELEASE:**

Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material.

### **WATER RELEASE:**

Cover with absorbent sheets, spill-control pads or pillows. Neutralize. Collect with absorbent into suitable container. Absorb with activated carbon. Remove trapped material with suction hoses. Collect spilled material using mechanical equipment. Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

### **OCCUPATIONAL RELEASE:**

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Keep separated from incompatible substances.

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### **EXPOSURE LIMITS:**

#### **ETHYL BENZENE:**

100 ppm (435 mg/m<sup>3</sup>) OSHA TWA

125 ppm (543 mg/m<sup>3</sup>) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

100 ppm ACGIH TWA

125 ppm ACGIH STEL

100 ppm (435 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

125 ppm (545 mg/m<sup>3</sup>) NIOSH recommended STEL

**VENTILATION:** Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

#### **800 ppm**

Any air-purifying half-mask respirator equipped with organic vapor cartridge(s).

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.

Any powered, air-purifying respirator with organic vapor cartridge(s).

Any supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

#### **Escape -**

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.

Any appropriate escape-type, self-contained breathing apparatus.

#### **For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** liquid  
**COLOR:** colorless  
**ODOR:** aromatic odor  
**MOLECULAR WEIGHT:** 106.17  
**MOLECULAR FORMULA:** C-H3-C-H2-C6-H5  
**BOILING POINT:** 277 F (136 C)  
**FREEZING POINT:** -139 F (-95 C)  
**VAPOR PRESSURE:** 7.1 mmHg @ 20 C  
**VAPOR DENSITY (air=1):** 3.66  
**SPECIFIC GRAVITY (water=1):** 0.8670  
**WATER SOLUBILITY:** 0.015%  
**PH:** Not available  
**VOLATILITY:** 100%  
**ODOR THRESHOLD:** 140 ppm  
**EVAPORATION RATE:** <1 (butyl acetate=1)  
**VISCOSITY:** 0.64 cP @ 25 C  
**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available  
**SOLVENT SOLUBILITY:**  
**Soluble:** alcohol, ether, benzene, sulfur dioxide, carbon tetrachloride  
**Insoluble:** ammonia

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:** acids, bases, oxidizing materials, combustible materials

**HAZARDOUS DECOMPOSITION:**  
Thermal decomposition products: oxides of carbon

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**ETHYL BENZENE:**

**IRRITATION DATA:** 15 mg/24 hour(s) open skin-rabbit mild; 500 mg eyes-rabbit severe

**TOXICITY DATA:** 55000 mg/m<sup>3</sup>/2 hour(s) inhalation-rat LC50; >5000 mg/kg skin-rabbit LD50; 3500 mg/kg oral-rat LD50

**CARCINOGEN STATUS:** IARC: Human Inadequate Evidence, Animal Sufficient Evidence, Group 2B; ACGIH: A3 -Confirmed Animal Carcinogen

**LOCAL EFFECTS:**

Irritant: inhalation, skin, eye

**ACUTE TOXICITY LEVEL:**

Moderately Toxic: ingestion

Slightly Toxic: inhalation, dermal absorption

**TARGET ORGANS:** central nervous system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** kidney disorders, liver disorders, respiratory disorders, skin disorders and allergies

**TUMORIGENIC DATA:** Available.

**MUTAGENIC DATA:** Available.

**REPRODUCTIVE EFFECTS DATA:** Available.

**ADDITIONAL DATA:** May cross the placenta.

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## 12. ECOLOGICAL INFORMATION

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**FATE AND TRANSPORT:**

**KOW:** 154170.05 (log = 5.196) (estimated from water solubility)

**KOC:** 44668.36 (log = 4.657) (estimated from water solubility)

**HENRY'S LAW CONSTANT:** 6.6 E -3 atm-m<sup>3</sup>/mol

**BIOCONCENTRATION:** 36.39 (estimated from water solubility)

**AQUATIC PROCESSES:** 2.6730095 hours (River Model: 1 m deep, 1 m/s flow, 3 m/s wind)

**ENVIRONMENTAL SUMMARY:** Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the bodies of living organisms. Highly volatile from water.

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

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## 14. TRANSPORT INFORMATION

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**U.S. DOT 49 CFR 172.101:**  
**PROPER SHIPPING NAME:** Ethylbenzene  
**ID NUMBER:** UN1175  
**HAZARD CLASS OR DIVISION:** 3  
**PACKING GROUP:** II  
**LABELING REQUIREMENTS:** 3

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**  
**SHIPPING NAME:** Ethylbenzene  
**UN NUMBER:** UN1175  
**CLASS:** 3  
**PACKING GROUP/CATEGORY:** II

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## 15. REGULATORY INFORMATION

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### U.S. REGULATIONS:

**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**  
**ETHYL BENZENE:** 1000 LBS RQ

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):** Not regulated.

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):** Not regulated.

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**

ACUTE: Yes  
CHRONIC: Yes  
FIRE: Yes  
REACTIVE: No  
SUDDEN RELEASE: No

**SARA TITLE III SECTION 313 (40 CFR 372.65):**  
**ETHYL BENZENE**

**OSHA PROCESS SAFETY (29 CFR 1910.119):** Not regulated.

### STATE REGULATIONS:

**California Proposition 65:**  
Known to the state of California to cause the following:  
**ETHYL BENZENE**  
Cancer (Jun 11, 2004)

### CANADIAN REGULATIONS:

**WHMIS CLASSIFICATION:** B2.

**NATIONAL INVENTORY STATUS:**

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CANADA INVENTORY (DSL/NDSL):** Not determined.

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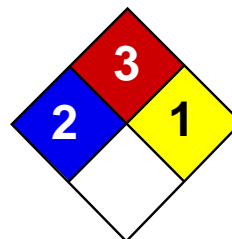
**16. OTHER INFORMATION**

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet Cumene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Cumene

**Catalog Codes:** SLC3052

**CAS#:** 98-82-8

**RTECS:** GR8575000

**TSCA:** TSCA 8(b) inventory: Cumene

**CI#:** Not available.

**Synonym:** Isopropyl benzene; Cumol; 2-Phenyl propane; (1-Methylethyl)benzene

**Chemical Name:** Isopropylbenzene

**Chemical Formula:** C<sub>6</sub>H<sub>5</sub>CH(CH<sub>3</sub>)<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Cumene	98-82-8	100

**Toxicological Data on Ingredients:** Cumene: ORAL (LD50): Acute: 1400 mg/kg [Rat]. 12750 mg/kg [Mouse]. DERMAL (LD50): Acute: 12300 mg/kg [Rabbit].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Very hazardous in case of skin contact (permeator). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, the nervous system, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 424°C (795.2°F)

**Flash Points:** CLOSED CUP: 36°C (96.8°F). OPEN CUP: 44°C (111.2°F).

**Flammable Limits:** LOWER: 0.9% UPPER: 6.5%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.



## Section 7: Handling and Storage

### Precautions:

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

### Storage:

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 50 CEIL: 75 (ppm) TWA: 245 CEIL: 365 (mg/m<sup>3</sup>) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 120.2 g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 152.4°C (306.3°F)

**Melting Point:** -96°C (-140.8°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.862 (Water = 1)

**Vapor Pressure:** 8 mm of Hg (@ 20°C)

**Vapor Density:** 4.14 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 1.2 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil; log(oil/water) = 3.7

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Very slightly soluble in cold water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

### Section 11: Toxicological Information

**Routes of Entry:** Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

Acute oral toxicity (LD50): 1400 mg/kg [Rat]. Acute dermal toxicity (LD50): 12300 mg/kg [Rabbit].

**Chronic Effects on Humans:** The substance is toxic to lungs, the nervous system, mucous membranes.

**Other Toxic Effects on Humans:** Very hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information

**DOT Classification:** Class 3: Flammable liquid.

**Identification:** : Isopropylbenzene : UN1918 PG: III

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: Cumene Massachusetts RTK: Cumene TSCA 8(b) inventory: Cumene SARA 313 toxic chemical notification and release reporting: Cumene CERCLA: Hazardous substances.: Cumene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

#### DSCL (EEC):

R10- Flammable. R22- Harmful if swallowed. R38- Irritating to skin. R41- Risk of serious damage to eyes.

#### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

#### National Fire Protection Association (U.S.A.):

**Health:** 2

**Flammability:** 3

**Reactivity:** 1

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

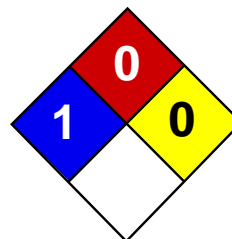
**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/11/2005 11:43 AM

**Last Updated:** 05/21/2013 12:00 PM

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Health	1
Fire	0
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet

### Lead MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Lead

**Catalog Codes:** SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

**CAS#:** 7439-92-1

**RTECS:** OF7525000

**TSCA:** TSCA 8(b) inventory: Lead

**CI#:** Not available.

**Synonym:** Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

**Chemical Name:** Lead

**Chemical Formula:** Pb

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

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#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Lead	7439-92-1	100

**Toxicological Data on Ingredients:** Lead LD50: Not available. LC50: Not available.

#### Section 3: Hazards Identification

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

Slightly hazardous in case of skin contact (permeator). **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** May be combustible at high temperature.

**Auto-Ignition Temperature:** Not available.

**Flash Points:** Not available.

**Flammable Limits:** Not available.

**Products of Combustion:** Some metallic oxides.

**Fire Hazards in Presence of Various Substances:** Non-flammable in presence of open flames and sparks, of shocks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

**Special Remarks on Fire Hazards:** When heated to decomposition it emits highly toxic fumes of lead.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:** Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 0.05 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] TWA: 0.05 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] TWA: 0.03 (mg/m<sup>3</sup>) from NIOSH [United States] TWA: 0.05 (mg/m<sup>3</sup>) [Canada] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid. (Metal solid.)

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 207.21 g/mole

**Color:** Bluish-white. Silvery. Gray

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 1740°C (3164°F)

**Melting Point:** 327.43°C (621.4°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 11.3 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Insoluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, excess heat

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Can react vigorously with oxidizing materials. Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Inhalation. Ingestion.

**Toxicity to Animals:**

LD50: Not available. LC50: Not available.

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC. May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

**Other Toxic Effects on Humans:** Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential: Skin: Lead metal granules or dust: May cause skin irritation by mechanical action. Lead metal foil, shot or sheets: Not likely to cause skin irritation Eyes: Lead metal granules or dust: Can irritate eyes by mechanical action. Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation. Inhalation: In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes. Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungs by mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually absorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, delirium, convulsions/seizures, coma, and death. Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count. Ingestion: Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead colic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases. Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

**Section 13: Disposal Considerations****Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**Section 14: Transport Information**

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

**Section 15: Other Regulatory Information****Federal and State Regulations:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Lead California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead Connecticut hazardous material survey.: Lead Illinois toxic substances disclosure to employee act: Lead Illinois chemical safety act: Lead New York release reporting list: Lead Rhode Island RTK hazardous substances: Lead Pennsylvania RTK: Lead

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**

R20/22- Harmful by inhalation and if swallowed. R33- Danger of cumulative effects. R61- May cause harm to the unborn child. R62- Possible risk of impaired fertility. S36/37- Wear suitable protective clothing and gloves. S44- If you feel unwell, seek medical advice (show the label when possible). S53- Avoid exposure - obtain special instructions before use.

**HMIS (U.S.A.):**

**Health Hazard:** 1

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 1



**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

## Section 16: Other Information

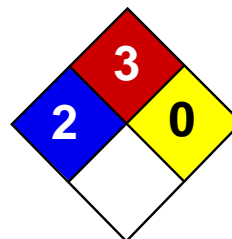
**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:21 PM

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Health	2
Fire	3
Reactivity	0
Personal Protection	J

## Material Safety Data Sheet m-Xylene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** m-Xylene

**Catalog Codes:** SLX1066

**CAS#:** 108-38-3

**RTECS:** ZE2275000

**TSCA:** TSCA 8(b) inventory: m-Xylene

**CI#:** Not applicable.

**Synonym:** m-Methyltoluene

**Chemical Name:** 1,3-Dimethylbenzene

**Chemical Formula:** C<sub>6</sub>H<sub>4</sub>(CH<sub>3</sub>)<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{m-}Xylene	108-38-3	100

**Toxicological Data on Ingredients:** m-Xylene: ORAL (LD50): Acute: 5000 mg/kg [Rat.]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit.].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to blood, kidneys, the nervous system, liver. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:** Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 527°C (980.6°F)

**Flash Points:** CLOSED CUP: 25°C (77°F). OPEN CUP: 28.9°C (84°F) (Cleveland).

**Flammable Limits:** LOWER: 1.1% UPPER: 7%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:**

Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Flammable liquid, insoluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

### Section 7: Handling and Storage

**Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents.

**Storage:**

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:** Splash goggles. Lab coat. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) TWA: 434 STEL: 651 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Liquid.)

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 106.17 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 139.3°C (282.7°F)

**Melting Point:** -47.87°C (-54.2°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.86 (Water = 1)

**Vapor Pressure:** 6 mm of Hg (@ 20°C)

**Vapor Density:** 3.7 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.62 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether.

**Solubility:**

Easily soluble in methanol, diethyl ether. Insoluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

## Section 11: Toxicological Information

**Routes of Entry:** Eye contact.

**Toxicity to Animals:**

Acute oral toxicity (LD50): 5000 mg/kg [Rat.]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit.].

**Chronic Effects on Humans:** The substance is toxic to blood, kidneys, the nervous system, liver.

**Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**

0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier. 0900 Detected in maternal milk in human. Narcotic effect; may cause nervous system disturbances.

**Special Remarks on other Toxic Effects on Humans:** Material is irritating to mucous membranes and upper respiratory tract.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Class 3: Flammable liquid.

**Identification:** : Xylene : UN1307 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: m-Xylene Massachusetts RTK: m-Xylene TSCA 8(b) inventory: m-Xylene SARA 313 toxic chemical notification and release reporting: m-Xylene CERCLA: Hazardous substances.: m-Xylene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

#### DSCL (EEC):

R10- Flammable. R38- Irritating to skin. R41- Risk of serious damage to eyes.

#### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** j

#### National Fire Protection Association (U.S.A.):

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

### References:

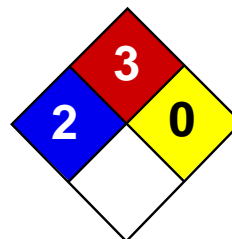
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangereuses au Canada. Centre de conformité internationale. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:33 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet p-Xylene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** p-Xylene

**Catalog Codes:** SLX1120

**CAS#:** 106-42-3

**RTECS:** ZE2625000

**TSCA:** TSCA 8(b) inventory: p-Xylene

**CI#:** Not applicable.

**Synonym:** p-Methyltoluene

**Chemical Name:** 1,4-Dimethylbenzene

**Chemical Formula:** C<sub>6</sub>H<sub>4</sub>(CH<sub>3</sub>)<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{p-}Xylene	106-42-3	100

**Toxicological Data on Ingredients:** p-Xylene: ORAL (LD50): Acute: 5000 mg/kg [Rat.]. DERMAL (LD50): Acute: 12400 mg/kg [Rabbit.]. VAPOR (LC50): Acute: 4550 ppm 4 hour(s) [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to blood, kidneys, the nervous system, liver. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:** Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 527°C (980.6°F)

**Flash Points:** CLOSED CUP: 25°C (77°F). OPEN CUP: 28.9°C (84°F) (Cleveland).

**Flammable Limits:** LOWER: 1.1% UPPER: 7%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:**

Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

### Section 7: Handling and Storage



**Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents.

**Storage:**

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) TWA: 434 STEL: 651 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Liquid.)

**Odor:** Not available.

**Taste:** Not available.

**Molecular Weight:** 106.17 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 138°C (280.4°F)

**Melting Point:** 12°C (53.6°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.86 (Water = 1)

**Vapor Pressure:** 9 mm of Hg (@ 20°C)

**Vapor Density:** 3.7 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.62 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, methanol, diethyl ether.

**Solubility:**

Easily soluble in methanol, diethyl ether. Insoluble in cold water, hot water.

**Section 10: Stability and Reactivity Data**

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** No.

**Section 11: Toxicological Information**

**Routes of Entry:** Eye contact.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 5000 mg/kg [Rat.]. Acute dermal toxicity (LD50): 12400 mg/kg [Rabbit.]. Acute toxicity of the vapor (LC50): 4550 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:** The substance is toxic to blood, kidneys, the nervous system, liver.

**Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**

0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier. 0900 Detected in maternal milk in human. Narcotic effect; may cause nervous system disturbances.

**Special Remarks on other Toxic Effects on Humans:** Material is irritating to mucous membranes and upper respiratory tract.

**Section 12: Ecological Information**

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

**Section 13: Disposal Considerations**

**Waste Disposal:**

## Section 14: Transport Information

**DOT Classification:** Class 3: Flammable liquid.

**Identification:** : Xylene : UN1307 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: p-Xylene Florida: p-Xylene Massachusetts RTK: p-Xylene New Jersey: p-Xylene TSCA 8(b) inventory: p-Xylene SARA 313 toxic chemical notification and release reporting: p-Xylene CERCLA: Hazardous substances.: p-Xylene

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

### Other Classifications:

#### WHMIS (Canada):

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

#### DSCL (EEC):

R10- Flammable. R38- Irritating to skin. R41- Risk of serious damage to eyes. R48/20- Harmful: danger of serious damage to health by prolonged exposure through inhalation.

#### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

#### National Fire Protection Association (U.S.A.):

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

#### Protective Equipment:

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

### References:

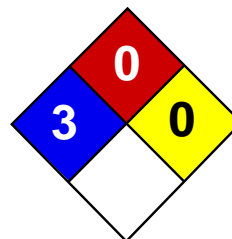
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la Sant   et de la S  curit   du Travail du Qu  bec. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du r  glement sur le transport des marchandises dangereuses au Canada. Centre de conformit   international Lt  e. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:33 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	3
Fire	0
Reactivity	0
Personal Protection	

## Material Safety Data Sheet Mercury MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Mercury

**Catalog Codes:** SLM3505, SLM1363

**CAS#:** 7439-97-6

**RTECS:** OV4550000

**TSCA:** TSCA 8(b) inventory: Mercury

**CI#:** Not applicable.

**Synonym:** Quick Silver; Colloidal Mercury; Metallic Mercury; Liquid Silver; Hydragryrum

**Chemical Name:** Mercury

**Chemical Formula:** Hg

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Mercury	7439-97-6	100

**Toxicological Data on Ingredients:** Mercury LD50: Not available. LC50: Not available.

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Hazardous in case of skin contact (permeator). **CARCINOGENIC EFFECTS:** Classified A5 (Not suspected for human.) by ACGIH. 3 (Not classifiable for human.) by IARC. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to blood, kidneys, liver, brain, peripheral nervous system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation.

Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

## Section 4: First Aid Measures

### **Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

### **Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

### **Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

### **Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

### **Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

### **Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

### **Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

### **Special Remarks on Fire Hazards:**

When thrown into mercury vapor, boron phosphodiiodide ignites at once. Flame forms with chlorine jet over mercury surface at 200 deg to 300 deg C. Mercury undergoes hazardous reactions in the presence of heat and sparks or ignition.

### **Special Remarks on Explosion Hazards:**

A violent exothermic reaction or possible explosion occurs when mercury comes in contact with lithium and rubidium. CHLORINE DIOXIDE & LIQUID HG, WHEN MIXED, EXPLODE VIOLENTLY. Mercury and Ammonia can produce an

explosive compound. A mixture of the dry carbonyl and oxygen will explode on vigorous shaking with mercury. Methyl azide in the presence of mercury was shown to be potentially explosive.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

**Precautions:**

Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 0.025 from ACGIH (TLV) [United States] SKIN TWA: 0.05 CEIL: 0.1 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Inhalation TWA: 0.025 (mg/m<sup>3</sup>) [United Kingdom (UK)] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Heavy liquid)

**Odor:** Odorless.

**Taste:** Not available.

**Molecular Weight:** 200.59 g/mole

**Color:** Silver-white

**pH (1% soln/water):** Not available.

**Boiling Point:** 356.73°C (674.1°F)

**Melting Point:** -38.87°C (-38°F)

**Critical Temperature:** 1462°C (2663.6°F)

**Specific Gravity:** 13.55 (Water = 1)

**Vapor Pressure:** Not available.

**Vapor Density:** 6.93 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Very slightly soluble in cold water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents, metals.

**Corrosivity:** Non-corrosive in presence of glass.

### Special Remarks on Reactivity:

Ground mixtures of sodium carbide and mercury, aluminum, lead, or iron can react vigorously. A violent exothermic reaction or possible explosion occurs when mercury comes in contact with lithium and rubidium. Incompatible with boron diiodophosphide; ethylene oxide; metal oxides, metals(aluminum, potassium, lithium, sodium, rubidium); methyl azide; methylsilane, oxygen; oxidants(bromine, peroxyformic acid, chlorine dioxide, nitric acid, tetracarbonylnickel, nitromethane, silver perchlorate, chlorates, sulfuric acid, nitrates,); tetracarbonylnickel, oxygen, acetylinic compounds, ammonia, ethylene oxide, methylsilane, calcium,

### Special Remarks on Corrosivity:

The high mobility and tendency to dispersion exhibited by mercury, and the ease with which it forms alloys (amalgam) with many laboratory and electrical contact metals, can cause severe corrosion problems in laboratories. Special precautions: Mercury can attack copper and copper alloy materials.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

### Toxicity to Animals:

LD50: Not available. LC50: Not available.

### Chronic Effects on Humans:

CARCINOGENIC EFFECTS: Classified A5 (Not suspected for human.) by ACGIH. 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, liver, brain, peripheral nervous system, central nervous system (CNS).

### Other Toxic Effects on Humans:

Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**



May affect genetic material. May cause cancer based on animal data. Passes through the placental barrier in animal. May cause adverse reproductive effects(paternal effects- spermatogenesis; effects on fertility - fetotoxicity, post-implantation mortality), and birth defects.

**Special Remarks on other Toxic Effects on Humans:**

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### Section 14: Transport Information

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Mercury UNNA: 2809 PG: III

**Special Provisions for Transport:** Not available.

### Section 15: Other Regulatory Information

**Federal and State Regulations:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Mercury California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Mercury Connecticut hazardous material survey.: Mercury Illinois toxic substances disclosure to employee act: Mercury Illinois chemical safety act: Mercury New York acutely hazardous substances: Mercury Rhode Island RTK hazardous substances: Mercury Pennsylvania RTK: Mercury Minnesota: Mercury Massachusetts RTK: Mercury New Jersey: Mercury New Jersey spill list: Mercury Louisiana spill reporting: Mercury California Director's List of Hazardous Substances.: Mercury TSCA 8(b) inventory: Mercury SARA 313 toxic chemical notification and release reporting: Mercury CERCLA: Hazardous substances.: Mercury: 1 lbs. (0.4536 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**

R23- Toxic by inhalation. R33- Danger of cumulative effects. R38- Irritating to skin. R41- Risk of serious damage to eyes. R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S2- Keep out of the

reach of children. S7- Keep container tightly closed. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S46- If swallowed, seek medical advice immediately and show this container or label. S60- This material and its container must be disposed of as hazardous waste. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

**HMIS (U.S.A.):**

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:**

**National Fire Protection Association (U.S.A.):**

**Health:** 3

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

## Section 16: Other Information

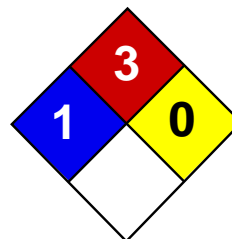
**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:22 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet

### Methyl ethyl ketone MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Methyl ethyl ketone

**Catalog Codes:** SLM2626, SLM3232

**CAS#:** 78-93-3

**RTECS:** EL6475000

**TSCA:** TSCA 8(b) inventory: Methyl ethyl ketone

**CI#:** Not applicable.

**Synonym:** 2-Butanone

**Chemical Name:** Methyl Ethyl Ketone

**Chemical Formula:** C<sub>4</sub>H<sub>8</sub>O

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Methyl ethyl ketone	78-93-3	100

**Toxicological Data on Ingredients:** Methyl ethyl ketone: ORAL (LD50): Acute: 2737 mg/kg [Rat]. 4050 mg/kg [Mouse]. DERMAL (LD50): Acute: 6480 mg/kg [Rabbit]. VAPOR (LC50): Acute: 23500 mg/m 8 hours [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation (lung irritant).

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 404°C (759.2°F)

**Flash Points:** CLOSED CUP: -9°C (15.8°F). OPEN CUP: -5.5556°C (22°F) (Tag).

**Flammable Limits:** LOWER: 1.8% UPPER: 10%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials, of acids.

**Fire Fighting Media and Instructions:**

Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

**Special Remarks on Fire Hazards:**

Ignition on contact with potassium t-butoxide. Vapor may cause a flash fire

**Special Remarks on Explosion Hazards:**

Reaction with Hydrogen Peroxide + nitric acid forms heat and shock-sensitive explosive product. Mixture with 2-propanol will produce explosive peroxides during storage.

## Section 6: Accidental Release Measures

**Small Spill:**

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

**Large Spill:**

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined

areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

### Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 200 STEL: 300 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 150 STEL: 300 (ppm) [Australia] TWA: 590 STEL: 885 (mg/m<sup>3</sup>) from NIOSH TWA: 200 STEL: 300 (ppm) from NIOSH TWA: 590 STEL: 885 (mg/m<sup>3</sup>) [Canada] TWA: 200 STEL: 300 (ppm) from OSHA (PEL) [United States] TWA: 590 STEL: 885 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

### Odor:

Acetone-like Pleasant. Pungent. Sweetish. (Strong.)

**Taste:** Not available.

**Molecular Weight:** 72.12g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not available.

**Boiling Point:** 79.6 (175.3°F)

**Melting Point:** -86°C (-122.8°F)

**Critical Temperature:** 262.5°C (504.5°F)

**Specific Gravity:** 0.805(Water = 1)

**Vapor Pressure:** 10.3 kPa (@ 20°C)

**Vapor Density:** 2.41 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.25 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil;  $\log(\text{oil/water}) = 0.3$

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether, acetone.

**Solubility:** Soluble in cold water, diethyl ether, acetone.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources, mechanical shock, incompatible materials.

**Incompatibility with various substances:** Reactive with oxidizing agents, metals, acids, alkalis.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Incompatible with chloroform, copper, hydrogen peroxide, nitric acid, potassium t-butoxide, 2-propanol, chlorosulfonic acid, strong oxidizers, amines, ammonia, inorganic acids, isocyanates, caustics, pyridines. Vigorous reaction with chloroform +alkali.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2737 mg/kg [Rat]. Acute dermal toxicity (LD50): 6480 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 32000 mg/m<sup>3</sup> 4 hours [Mouse].

**Chronic Effects on Humans:**

MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Classified POSSIBLE for human. May cause damage to the following organs: gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS).

**Other Toxic Effects on Humans:** Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation (lung irritant).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** May cause birth defects based on animal data. Embryotoxic and/or foetotoxic in animal.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Causes skin irritation. May be absorbed through the skin. Eyes: Causes eye irritation. Inhalation: Inhalation of high concentrations may cause central nervous effects characterized by headache, dizziness, unconsciousness, and coma. Causes respiratory tract irritation and affects the sense organs. May affect the liver and urinary system. Ingestion: Causes gastrointestinal tract irritation with nausea, vomiting and diarrhea. May affect the liver. Chronic Potential Health Effects: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis.

## Section 12: Ecological Information

**Ecotoxicity:** Ecotoxicity in water (LC50): 3220 mg/l 96 hours [Fathead Minnow]. 1690 mg/l 96 hours [Bluegill].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Ethyl methyl ketone UNNA: 1193 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**

New York release reporting list: Methyl ethyl ketone Rhode Island RTK hazardous substances: Methyl ethyl ketone Pennsylvania RTK: Methyl ethyl ketone Minnesota: Methyl ethyl ketone Massachusetts RTK: Methyl ethyl ketone New Jersey: Methyl ethyl ketone California Director's list of Hazardous Substances: Methyl ethyl ketone TSCA 8(b) inventory: Methyl ethyl ketone TSCA 8(d) H and S data reporting: Methyl ethyl ketone: Effective: 10/4/82; Sunset: 10/4/92 SARA 313 toxic chemical notification and release reporting: Methyl ethyl ketone CERCLA: Hazardous substances.: Methyl ethyl ketone: 5000 lbs. (2268 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**

R11- Highly flammable. R36/37- Irritating to eyes and respiratory system. S9- Keep container in a well-ventilated place. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S33- Take precautionary measures against static discharges.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 1

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:39 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*





Material Safety Data Sheet  
Normal-Butylbenzene, 99+%

MSDS# 55434

### Section 1 - Chemical Product and Company Identification

MSDS Name: Normal-Butylbenzene, 99+%  
Catalog Numbers: AC107850000, AC107850010, AC107850050, AC107850250, AC107850500, AC107851000  
AC107851000, AC107852500  
Synonyms: 1-Phenylbutane

Company Identification: Acros Organics BVBA  
Janssen Pharmaceuticaaan 3a  
2440 Geel, Belgium  
Acros Organics  
One Reagent Lane  
Fair Lawn, NJ 07410  
Company Identification: (USA)  
For information in the US, call: 800-ACROS-01  
For information in Europe, call: +32 14 57 52 11  
Emergency Number, Europe: +32 14 57 52 99  
Emergency Number US: 201-796-7100  
CHEMTREC Phone Number, US: 800-424-9300  
CHEMTREC Phone Number, Europe: 703-527-3887

### Section 2 - Composition, Information on Ingredients

-----  
CAS#: 104-51-8  
Chemical Name: n-Butylbenzene  
%: >99  
EINECS#: 203-209-7  
-----

Hazard Symbols: None listed  
Risk Phrases: 10

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Warning! Flammable liquid and vapor. The toxicological properties of this material have not been fully investigated. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Target Organs: Liver, nervous system.

#### Potential Health Effects

Eye: May cause eye irritation. The toxicological properties of this material have not been fully investigated.  
Skin: May cause skin irritation. The toxicological properties of this material have not been fully investigated.  
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.  
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. Vapors may cause dizziness or suffocation.  
Chronic: No information found.

### Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.  
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

### Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Use agent most appropriate to extinguish fire. Do NOT use straight streams of water.

Autoignition Temperature: 412 deg C ( 773.60 deg F)

Flash Point: 59 deg C ( 138.20 deg F)

Explosion Limits: Lower: .80 vol %

Explosion Limits: Upper: 5.80 vol %

NFPA Rating: health: 1; flammability: 2; instability: 0;

### Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

### Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

### Section 8 - Exposure Controls, Personal Protection

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
n-Butylbenzene	none listed	none listed	none listed

OSHA Vacated PELs: n-Butylbenzene: None listed

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.  
Clothing: Wear appropriate protective clothing to prevent skin exposure.  
Respirators: Wear a NIOSH/MSHA or European Standard EN 149 approved full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

#### Section 9 - Physical and Chemical Properties

Physical State: Liquid

Color: clear, colorless

Odor: None reported.

pH: Not available

Vapor Pressure: 1.33 hPa @ 23 C

Vapor Density: 4.6

Evaporation Rate: Not available

Viscosity: Not available

Boiling Point: 183 deg C @ 760.00mm Hg ( 361.40°F)

Freezing/Melting Point: -88 deg C ( -126.40°F)

Decomposition Temperature:

Solubility in water: insoluble

Specific Gravity/Density: .8600g/cm3

Molecular Formula: C10H14

Molecular Weight: 134.22

#### Section 10 - Stability and Reactivity

Chemical Stability:

Stable under normal temperatures and pressures.

Conditions to Avoid:

Incompatible materials, ignition sources, excess heat, strong oxidants.

Incompatibilities with Other Materials

Not available

Hazardous Decomposition Products

Carbon monoxide, carbon monoxide, carbon dioxide.

Hazardous Polymerization

Has not been reported.

#### Section 11 - Toxicological Information

RTECS#: CAS# 104-51-8: CY9070000

LD50/LC50: RTECS: Not available.

Carcinogenicity: n-Butylbenzene - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other: See actual entry in RTECS for complete information.

#### Section 12 - Ecological Information

Other: No information available.

#### Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

#### Section 14 - Transport Information

US DOT

Shipping Name: BUTYL BENZENES

Hazard Class: 3

UN Number: UN2709

Packing Group: III

Canada TDG

Shipping Name: Not available

Hazard Class:

UN Number:

Packing Group:

#### Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available

Risk Phrases:

R 10 Flammable.

Safety Phrases:

S 9 Keep container in a well-ventilated place.

S 16 Keep away from sources of ignition - No smoking.

S 24/25 Avoid contact with skin and eyes.

S 28A After contact with skin, wash immediately with plenty of water.

S 33 Take precautionary measures against static discharges.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 104-51-8: 1

Canada

CAS# 104-51-8 is listed on Canada's DSL List

Canadian WHMIS Classifications: B3, D2B

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 104-51-8 is not listed on Canada's Ingredient Disclosure List.

US Federal

TSCA

CAS# 104-51-8 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 4/15/1998

Revision #5 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.

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# Material Safety Data Sheet

## Propylbenzene, 98% (GC)

ACC# 12270

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Propylbenzene, 98% (GC)**Catalog Numbers:** AC418430000, AC418430250, AC418431000**Synonyms:** 1-Phenyl Propane.**Company Identification:**

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

**For information in North America, call:** 800-ACROS-01**For emergencies in the US, call CHEMTREC:** 800-424-9300

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
103-65-1	Propyl Benzene	98	203-132-9

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 30 deg C.

**Warning! Flammable liquid and vapor.** Causes respiratory tract irritation. May cause eye and skin irritation. May cause digestive tract irritation with nausea, vomiting, and diarrhea.**Target Organs:** None.**Potential Health Effects****Eye:** May cause eye irritation.**Skin:** May cause skin irritation.**Ingestion:** May cause gastrointestinal irritation with nausea, vomiting and diarrhea.**Inhalation:** Causes respiratory tract irritation. Vapors may cause dizziness or suffocation.**Chronic:** No information found.

### Section 4 - First Aid Measures

**Eyes:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.**Skin:** Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.**Ingestion:** If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If

not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Flammable liquid and vapor. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

**Extinguishing Media:** For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

**Flash Point:** 30 deg C ( 86.00 deg F)

**Autoignition Temperature:** 450 deg C ( 842.00 deg F)

**Explosion Limits, Lower:**.80 vol %

**Upper:** 6.00 vol %

**NFPA Rating:** (estimated) Health: 2; Flammability: 3; Instability: 0

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Storage:** Keep away from heat, sparks, and flame. Keep away from sources of ignition. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use adequate ventilation to keep airborne concentrations low. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Propyl Benzene	none listed	none listed	none listed

**OSHA Vacated PELs:** Propyl Benzene: No OSHA Vacated PELs are listed for this chemical.

**Personal Protective Equipment**

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear, colorless

**Odor:** benzene-like

**pH:** Not available.

**Vapor Pressure:** Not available.

**Vapor Density:** 4.1

**Evaporation Rate:**Not available.

**Viscosity:** Not available.

**Boiling Point:** 158 deg C @ 760.00mm Hg

**Freezing/Melting Point:**-99 deg C

**Decomposition Temperature:**Not available.

**Solubility:** practically insoluble in water

**Specific Gravity/Density:**.8620g/cm<sup>3</sup>

**Molecular Formula:**C<sub>9</sub>H<sub>12</sub>

**Molecular Weight:**120.19

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** Incompatible materials, ignition sources, excess heat, strong oxidants.

**Incompatibilities with Other Materials:** Strong oxidizing agents.

**Hazardous Decomposition Products:** Carbon monoxide, carbon monoxide, carbon dioxide.

**Hazardous Polymerization:** Has not been reported

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 103-65-1: DA8750000

**LD50/LC50:**

CAS# 103-65-1:

Inhalation, rat: LC50 = 65000 ppm/2H;

Oral, mouse: LD50 = 5200 mg/kg;

Oral, rat: LD50 = 6040 mg/kg;

Oral, rat: LD50 = 7500 mg/kg;

**Carcinogenicity:**

CAS# 103-65-1: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information available.

**Teratogenicity:** No evidence of teratogenicity (BDH Hazard Data Sheets 1990, Merck Ltd, Dorset)

**Reproductive Effects:** No information available.

**Mutagenicity:** No information available.

**Neurotoxicity:** No information available.

**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** No data available. No information available.

**Environmental:** Degradation studies : Compound can be hydroxylated by *Mortierella isabellina* (Holland, H.L. J.Chem.Soc., Perkin Trans. 2 1990)

**Physical:** No information available.

**Other:** No information available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	N-PROPYL BENZENE	No information available.
<b>Hazard Class:</b>	3	
<b>UN Number:</b>	UN2364	
<b>Packing Group:</b>	III	

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 103-65-1 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.



**CERCLA Hazardous Substances and corresponding RQs**

None of the chemicals in this material have an RQ.

**SARA Section 302 Extremely Hazardous Substances**

None of the chemicals in this product have a TPQ.

**SARA Codes**

CAS # 103-65-1: immediate, fire.

**Section 313** No chemicals are reportable under Section 313.

**Clean Air Act:**

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

**Clean Water Act:**

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 103-65-1 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

**California Prop 65**

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations**

**European Labeling in Accordance with EC Directives**

**Hazard Symbols:**

XI

**Risk Phrases:**

R 10 Flammable.

R 37 Irritating to respiratory system.

**Safety Phrases:**

S 16 Keep away from sources of ignition - No smoking.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

**WGK (Water Danger/Protection)**

CAS# 103-65-1: No information available.

**Canada - DSL/NDSL**

CAS# 103-65-1 is listed on Canada's DSL List.

**Canada - WHMIS**

WHMIS: Not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List**

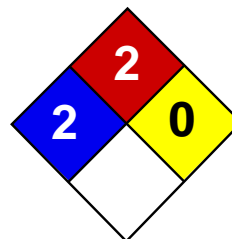
**Section 16 - Additional Information**

**MSDS Creation Date:** 4/13/1998

**Revision #4 Date:** 11/20/2008

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental,*

*consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*



Health	2
Fire	2
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet Naphthalene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Naphthalene

**Catalog Codes:** SLN1789, SLN2401

**CAS#:** 91-20-3

**RTECS:** QJ0525000

**TSCA:** TSCA 8(b) inventory: Naphthalene

**CI#:** Not available.

**Synonym:**

**Chemical Name:** Not available.

**Chemical Formula:** C<sub>10</sub>H<sub>8</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Naphthalene	91-20-3	100

**Toxicological Data on Ingredients:** Naphthalene: ORAL (LD50): Acute: 490 mg/kg [Rat]. 533 mg/kg [Mouse]. 1200 mg/kg [Guinea pig]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit]. VAPOR (LC50): Acute: 170 ppm 4 hour(s) [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant, permeator). Severe over-exposure can result in death.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

**Skin Contact:**

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

**Serious Skin Contact:** Not available.

**Inhalation:** Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

**Ingestion:**

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 567°C (1052.6°F)

**Flash Points:** CLOSED CUP: 88°C (190.4°F). OPEN CUP: 79°C (174.2°F).

**Flammable Limits:** LOWER: 0.9% UPPER: 5.9%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Not available.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable solid. **SMALL FIRE:** Use DRY chemical powder. **LARGE FIRE:** Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

## Section 6: Accidental Release Measures

**Small Spill:** Use appropriate tools to put the spilled solid in a convenient waste disposal container.

**Large Spill:**

Flammable solid. Stop leak if without risk. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

### Storage:

Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

Israel: TWA: 10 (ppm) STEL: 15 (ppm) from ACGIH (TLV) [1995] TWA: 52 STEL: 79 (mg/m<sup>3</sup>) from ACGIH [1995]  
Australia: STEL: 15 (ppm) Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid. (Crystalline solid.)

**Odor:** Aromatic.

**Taste:** Not available.

**Molecular Weight:** 128.19 g/mole

**Color:** White.

**pH (1% soln/water):** Not available.

**Boiling Point:** 218°C (424.4°F)

**Melting Point:** 80.2°C (176.4°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 1.162 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** 4.4 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.038 ppm

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:**

Partially dispersed in hot water, methanol, n-octanol. Very slightly dispersed in cold water. See solubility in methanol, n-octanol.

**Solubility:**

Partially soluble in methanol, n-octanol. Very slightly soluble in cold water, hot water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Highly reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** May attack some forms of rubber and plastic

**Polymerization:** No.

### Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 490 mg/kg [Rat]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 170 ppm 4 hour(s) [Rat].

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS).

**Other Toxic Effects on Humans:**

Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Ecotoxicity in water (LC50): 305.2 ppm 96 hour(s) [Trout].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information

**DOT Classification:** CLASS 4.1: Flammable solid.

**Identification:** : Naphthalene, refined : UN1334 PG: III

**Special Provisions for Transport:** Marine Pollutant

### Section 15: Other Regulatory Information

**Federal and State Regulations:**

Rhode Island RTK hazardous substances: Naphthalene Pennsylvania RTK: Naphthalene Florida: Naphthalene Minnesota: Naphthalene Massachusetts RTK: Naphthalene TSCA 8(b) inventory: Naphthalene TSCA 8(a) PAIR: Naphthalene TSCA 8(d) H and S data reporting: Naphthalene: 06/01/87 SARA 313 toxic chemical notification and release reporting: Naphthalene: 1% CERCLA: Hazardous substances.: Naphthalene: 100 lbs. (45.36 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS B-4: Flammable solid. CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**

R36- Irritating to eyes. R40- Possible risks of irreversible effects. R48/22- Harmful: danger of serious damage to health by prolonged exposure if swallowed. R48/23- Toxic: danger of serious damage to health by prolonged exposure through inhalation. R63- Possible risk of harm to the unborn child.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 2

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 2

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

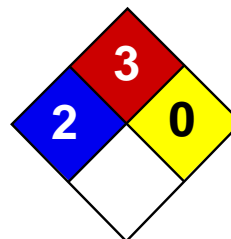
**Other Special Considerations:** Not available.

**Created:** 10/11/2005 01:30 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet o-Xylene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** o-Xylene

**Catalog Codes:** SLX1012

**CAS#:** 95-47-6

**RTECS:** ZE2450000

**TSCA:** TSCA 8(b) inventory: o-Xylene

**CI#:** Not applicable.

**Synonym:** 1,2-Dimethylbenzene

**Chemical Name:** o-Xylene

**Chemical Formula:** C<sub>6</sub>H<sub>4</sub>(CH<sub>3</sub>)<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{o-}Xylene	95-47-6	100

**Toxicological Data on Ingredients:** o-Xylene LD50: Not available. LC50: Not available.

### Section 3: Hazards Identification

**Potential Acute Health Effects:** Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

**CARCINOGENIC EFFECTS:** A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.

**MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Classified POSSIBLE for human. **DEVELOPMENTAL**

**TOXICITY:** Classified Reproductive system/toxin/male [POSSIBLE]. The substance may be toxic to kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 463°C (865.4°F)

**Flash Points:** CLOSED CUP: 17°C (62.6°F).

**Flammable Limits:** LOWER: 0.9% UPPER: 6.7%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Highly flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Slightly explosive in presence of open flames and sparks, of heat.

**Fire Fighting Media and Instructions:**

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

**Special Remarks on Fire Hazards:**

Vapors are heavier than air and may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

**Special Remarks on Explosion Hazards:**

Explosive in the form of vapor when exposed to heat or flame. Vapors may form explosive mixtures with air. Containers may explode when heated. Runoff to sewer may create fire or explosion hazard

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

### Storage:

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

### Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 434 STEL: 651 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States] STEL: 150 (ppm) from NIOSH STEL: 655 (mg/m<sup>3</sup>) from NIOSH Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid. (Mobile, nonpolar liquid.)

**Odor:** Aromatic. Sweetish.

**Taste:** Not available.

**Molecular Weight:** 106.17 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 144.4°C (291.9°F)

**Melting Point:** -25°C (-13°F)

**Critical Temperature:** 359°C (678.2°F)

**Specific Gravity:** 0.88 (Water = 1)

**Vapor Pressure:** 0.9 kPa (@ 20°C)

**Vapor Density:** 3.7 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 0.05 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil;  $\log(\text{oil/water}) = 3.1$

**Ionicity (in Water):** Not available.

**Dispersion Properties:**

Dispersed in diethyl ether. Is not dispersed in cold water, hot water. See solubility in diethyl ether, acetone.

**Solubility:**

Soluble in diethyl ether, acetone. Insoluble in cold water, hot water.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources, flames, incompatible materials.

**Incompatibility with various substances:** Reactive with oxidizing agents, acids.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Photochemically reactive. Incompatible with strong oxidizers(e.g. chlorine, bromine, fluorine), and strong acids (e.g. nitric acid, acetic acid).

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation.

**Toxicity to Animals:**

Lowest Published Lethal Dose - Inhalation (LCL): 6125 ppm 12 hours [Rat]; 6125 ppm 12 hours [Human] Lowest Published Lethal Dose - Oral: 5000 mg/kg [Rat]

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. TERATOGENIC EFFECTS: Classified POSSIBLE for human. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/male [POSSIBLE]. May cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS).

**Other Toxic Effects on Humans:** Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:**

May cause adverse reproductive effects (male) and birth defects based on animal data. 0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier. 0900 Detected in maternal milk in human. Narcotic effect; may cause nervous system disturbances.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects Skin: May cause skin irritation. May be absorbed through skin in harmful amounts. Eyes: Causes severe eye irritation. Inhalation: Causes respiratory tract and mucous membranes irritation. May affect sense organs, behavior (Central Nervous system) which may result in dizziness, general weakness, central nervous system depression, confusion, ataxia, disorientation, lethargy, drowsiness, headaches. May also affect respiration, cardiovascular system, liver, blood, and digestive system (nausea, vomiting) Ingestion: Harmful if swallowed. Causes digestive tract irritation with nausea, vomiting

and diarrhea. May also affect metabolism, liver, and urinary system, and central nervous system (excitement followed by headache, dizziness, drowsiness and nausea). Chronic Potential Health Effects: Skin: Prolonged or repeated contact may cause defatting of skin and dermatitis. Eyes: Prolonged or repeated exposure may cause conjunctivitis or permanent eye damage. Inhalation: Chronic inhalation may cause effects similar to those of acute inhalation.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Xylene UNNA: 1307 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

**Federal and State Regulations:**

Connecticut hazardous material survey.: o-Xylene Illinois chemical safety act: o-Xylene New York release reporting list: o-Xylene Pennsylvania RTK: o-Xylene Florida: o-Xylene Massachusetts RTK: o-Xylene Massachusetts spill list: o-Xylene New Jersey: o-Xylene New Jersey spill list: o-Xylene Louisiana spill reporting: o-Xylene California Director's List of Hazardous Substances: o-Xylene TSCA 8(b) inventory: o-Xylene TSCA 8(d) H and S data reporting: o-Xylene: Effective: 10/4/82; Sunset: 10/4/92 SARA 313 toxic chemical notification and release reporting: o-Xylene CERCLA: Hazardous substances.: o-Xylene: 1000 lbs. (453.6 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:**

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la Sant  et de la S curit  du Travail du Qu bec. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du r glement sur le transport des marchandises dangereuses au canada. Centre de conformit  international Lt e. 1986.

**Other Special Considerations:** Not available.

**Created:** 10/11/2005 12:54 PM

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# Monsanto

## Material Safety Data

### POLYCHLORINATED BIPHENYLS (PCBs)

Emergency Phone No.  
(Call Collect)  
314-694-1000

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#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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PRODUCT NAME: POLYCHLORINATED BIPHENYLS (PCBs)  
Aroclor® Series 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268  
Therminol® FR Series

MSDS Number: M00018515

Date: 12/95

Chemical Family: Chlorinated Hydrocarbons  
Chemical Name: Polychlorinated biphenyls  
Synonyms: PCBs, Chlorodiphenyls, Chlorinated biphenyls

Trade Names/Common Names:

PYRANOL® and INERTEEN® are trade names for commonly used dielectric fluids that may have contained varying amounts of PCBs as well as other components including chlorinated benzenes.

ASKAREL is the generic name for a broad class of fire resistant synthetic chlorinated hydrocarbons and mixtures used as dielectric fluids that commonly contained about 30 - 70% PCBs. Some ASKAREL fluids contained 99% or greater PCBs and some contained no PCBs.

PYDRAUL® is the trade name for hydraulic fluids that, prior to 1972, may have contained varying amounts of PCBs and other components including phosphate esters.

The product names/trade names are representative of several commonly used Monsanto products (or products formulated with Monsanto products). Other trademarked PCB products were marketed by Monsanto and other manufacturers. PCBs were also manufactured and sold by several European and Japanese companies. Contact the manufacturer of the trademarked product, if not in this listing, to determine if the formulation contained PCBs.

In 1972, Monsanto restricted sales of PCBs to applications involving only closed electrical systems, (transformers and capacitors). In 1977, all manufacturing and sales were voluntarily terminated. In 1979, EPA restricted the manufacture, processing, use, and distribution of PCBs to specifically exempted and authorized activities.

MONSANTO COMPANY, 800 N. LINDBERGH BLVD., ST. LOUIS, MO 63167

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT  
Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For calls originating elsewhere: 202-483-7616 (collect calls accepted)

For additional nonemergency information, call: 314-694-3344.

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## 2. COMPOSITION/INFORMATION ON INGREDIENTS

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Chemically, commercial PCBs are defined as a series of technical mixtures, consisting of many isomers and compounds that vary from mobile, oily liquids to white crystalline solids and hard noncrystalline resins. Technical products vary in composition, in the degree of chlorination, and possibly according to batch.

The mixtures generally used contain an average of 3 atoms of chlorine per molecule (42% chlorine) to 5 atoms of chlorine per molecule (54% chlorine). They were used as components of dielectric fluids in transformers and capacitors. Prior to 1972, PCB applications included heat transfer media, hydraulic, and other industrial fluids, plasticizers, carbonless copy paper, paints, inks, and adhesives.

<u>Component</u>	<u>CAS No.</u>
chlorinated biphenyl	1336-36-3
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5
Aroclor 1262	37324-23-5
Aroclor 1268	11100-14-4

There are also CAS Numbers for individual PCB congeners and for mixtures of Aroclor® products.

PCBs are identified as hazardous chemicals under criteria of the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Annual Report on Carcinogens (Seventh).

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## 3. HAZARDS IDENTIFICATION

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### EMERGENCY OVERVIEW

Appearance and Odor: PCB mixtures range in form and color from clear to amber liquids to white crystalline solids. They have a mild, distinctive odor and are not volatile at room temperature. Refer to Section 9 for details.

**WARNING!**  
**CAUSES EYE IRRITATION**  
**MAY CAUSE SKIN IRRITATION**

**PROCESSING AT ELEVATED TEMPERATURES MAY RELEASE VAPORS OR FUMES WHICH MAY CAUSE RESPIRATORY TRACT IRRITATION**

### POTENTIAL HEALTH EFFECTS

#### Likely Routes

of Exposure: Skin contact and inhalation of heated vapors

Eye Contact: Causes moderate irritation based on worker experience.

Skin Contact: Prolonged or repeated contact may result in redness, dry skin and defatting based on human experience. A potential exists for developing chloracne. PCBs can be absorbed through intact skin.

Inhalation: Due to the low volatility of PCBs, exposure to this material in ambient conditions is not expected to produce adverse health effects. However, at elevated processing temperatures, PCBs may produce a vapor that may cause respiratory tract irritation if inhaled based on human experience.

Ingestion: No more than slightly toxic based on acute animal toxicity studies. Coughing, choking and shortness of breath may occur if liquid material is accidentally drawn into the lungs during swallowing or vomiting.

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Other: Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed populations, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

Refer to Section 11 for toxicological information.

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#### 4. FIRST AID MEASURES

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IF IN EYES, immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF ON SKIN, immediately flush the area with plenty of water. Wash skin gently with soap as soon as it is available. Get medical attention if irritation persists.

IF INHALED, remove person to fresh air. If breathing is difficult, get medical attention.

IF SWALLOWED, do NOT induce vomiting. Rinse mouth with water. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTE TO PHYSICIANS: Hot PCBs may cause thermal burn. If electrical equipment arcs between conductors, PCBs or other chlorinated hydrocarbon dielectric fluids may decompose to produce hydrochloric acid (HCl), a respiratory irritant. If large amounts are swallowed, gastric lavage may be considered.

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#### 5. FIRE FIGHTING MEASURES

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Flash Point: 284 degrees F (140 degrees C) or higher depending on the chlorination level of the Aroclor product

Fire Point: 349 degrees F (176 degrees C) or higher depending on the chlorination level of the Aroclor product

NOTE: Refer to Section 9 for individual flash points and fire points.

##### Extinguishing

Media: Extinguish fire using agent suitable for surrounding fire. Use dry chemical, foam, carbon dioxide or water spray. Water may be ineffective. Use water spray to keep fire-exposed containers or transformer cool.

PCBs are fire-resistant compounds. They may decompose to form CO, CO<sub>2</sub>, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surfaces.

Dielectric fluids having PCBs and chlorinated benzenes as components have been reported to produce polychlorinated dibenzo-p-dioxins (PCDDs) and furans (PCDFs) during fire situations involving electrical equipment. At temperatures in the range of 600-650 degrees C in the presence of excess oxygen, PCBs may form polychlorinated dibenzofurans (PCDFs). Laboratory studies under similar conditions have demonstrated that PCBs do not produce polychlorinated dibenzo-p-dioxins (PCDDs).

Federal regulations require all PCB transformers to be registered with fire response personnel.

If a PCB transformer is involved in a fire-related incident, the owner of the transformer may be required to report the incident. Consult and follow appropriate federal, state and local regulations.

Fire Fighting Equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

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## 6. ACCIDENTAL RELEASE MEASURES

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Cleanup and disposal of liquid PCBs and other PCB items are strictly regulated by the federal government. The regulations are found at 40 CFR Part 761. Consult these regulations as well as applicable state and local regulations prior to any cleanup or disposal of PCBs, PCB items, or PCB contaminated items.

If PCBs leak or are spilled, the following steps should be taken immediately:

All nonessential personnel should leave the leak or spill area.

The area should be adequately ventilated to prevent the accumulation of vapors.

The spill/leak should be contained. Loss to sewer systems, navigable waterways, and streams should be prevented. Spills/leaks should be removed promptly by means of absorptive material, such as sawdust, vermiculite, dry sand, clay, dirt or other similar materials, or trapped and removed by pumping or other suitable means (traps, drip-pans, trays, etc.).

Personnel entering the spill or leak area should be furnished with appropriate personal protective equipment and clothing as needed. Refer to Section 8 for personal protection equipment and clothing.

Personnel trained in emergency procedures and protected against attendant hazards should shut off sources of PCBs, clean up spills, control and repair leaks, and fight fires in PCB areas.

Refer to Section 13 for disposal information and Sections 14 and 15 for information regarding reportable quantity, and Section 7 for marking information.

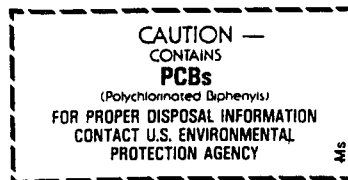
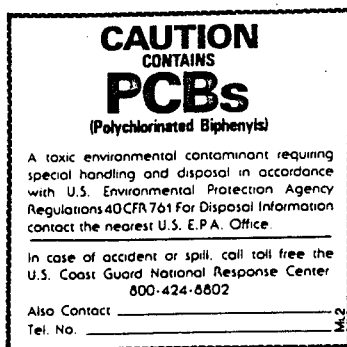
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## 7. HANDLING AND STORAGE

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Care should be taken to prevent entry into the environment through spills, leakage, use vaporization, or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact, flush with water. In case of spillage onto clothing, the clothing should be removed as soon as practical, skin washed, and clothing laundered. Comply with all federal, state, and local regulations.

Federal regulations under the Toxic Substances Control Act require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be marked (check regulations, 40 CFR 761, for details).



**Storage:** The storage of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB waste is strictly regulated by 40 CFR Part 761. The storage time is limited, the storage area must meet physical requirements, and the area must be labeled.

**Avoid contact with eyes.**  
**Wash thoroughly after handling.**  
**Avoid breathing processing fumes or vapors.**  
**Process using adequate ventilation.**

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**Eye Protection:** Wear chemical splash goggles and have eye baths available where there is significant potential for eye contact.

**Skin Protection:** Wear appropriate protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine the appropriate type glove for a given application. Wear chemical goggles, face shield, and chemical resistant clothing such as a rubber apron when splashing is likely. Wash immediately if skin is contacted. Remove contaminated clothing promptly and launder before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

ATTENTION! Repeated or prolonged skin contact may cause chloracne in some people.

**Respiratory Protection:** Avoid breathing vapor, mist, or dust. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended when airborne exposure limits are exceeded and, if used, replaces the need for face shield and/or chemical splash goggles. Consult respirator manufacturer to determine the type of equipment for a given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR Part 1910.134.

ATTENTION! Repeated or prolonged inhalation may cause chloracne in some people.

**Ventilation:** Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of vapor or mist, such as open process equipment.

**Airborne Exposure Limits:**

**Product:** Chlorodiphenyl (42% chlorine)

OSHA PEL: 1 mg/m<sup>3</sup> 8-hour time-weighted average - Skin\*  
ACGIH TLV: 1 mg/m<sup>3</sup> 8-hour time-weighted average - Skin\*

**Product:** Chlorodiphenyl (54% chlorine)

OSHA PEL: 0.5 mg/m<sup>3</sup> 8-hour time-weighted average - Skin\*  
ACGIH TLV: 0.5 mg/m<sup>3</sup> 8-hour time-weighted average - Skin\*

\*For Skin notation see Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Government Industrial Hygienists, 1995-1996.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTIES OF SELECTED AROCLORS <sup>®</sup>							
PROPERTY	1016	1221	1232	1242	1248	1254	1260
Color (APHA)	40	100	100	100	100	100	150
Physical state	mobile oil	mobile oil	mobile oil	mobile oil	mobile oil	viscous liquid	sticky resin
Stability	inert	inert	inert	inert	inert	inert	inert
Density (lb/gal 25°C)	11.40	9.85	10.55	11.50	12.04	12.82	13.50
Specific gravity x/15.5°C	1.36-1.37 x-25°	1.18-1.19 x-25°	1.27-1.28 x-25°	1.30-1.39 x-25°	1.40-1.41 x-65°	1.49-1.50 x-65°	1.55-1.56 x-90°
Distillation range (°C)	323-356	275-320	290-325	325-366	340-375	365-390	385-420
Acidity mg KOH/g, maximum	.010	.014	.014	.015	.010	.010	.014
Fire point (°C)	none to boiling point	176	238	none to boiling point	none to boiling point	none to boiling point	none to boiling point
Flash point (°C)	170	141-150	152-154	176-180	193-196	none	none
Vapor pressure (mm Hg @ 100°F)	NA	NA	0.005	0.001	0.00037	0.00006	NA
Viscosity (Saybolt Univ. Sec. @ 100°F) (centistokes)	71-81 13-16	38-41 3.6-4.6	44-51 5.5-7.7	82-92 16-19	185-240 42-52	1800-2500 390-540	— —

NA—Not Available

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

## 10. STABILITY AND REACTIVITY

Stability: PCBs are very stable, fire-resistant compounds.

Materials to Avoid: None

Hazardous Decomposition

Products: PCBs may decompose to form CO, CO<sub>2</sub>, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surface.

Hazardous Polymerization: Does not occur.

## 11. TOXICOLOGICAL INFORMATION

Data from laboratory studies conducted by Monsanto and from the available scientific literature are summarized below.

Single exposure (acute) studies indicate:

Oral - Slightly Toxic (Rat LD50 - 8.65 g/kg for 42% chlorinated; 11.9 g/kg for 54% chlorinated)

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The liquid products and their vapors are moderately irritating to eye tissues. Animal experiments of varying duration and at different air concentrations show that for similar exposure conditions, the 54% chlorinated material produces more liver injury than the 42% chlorinated material.

There are literature reports that PCBs can impair reproductive functions in monkeys. The National Cancer Institute (NCI) performed a study in 1977 using Aroclor 1254 with both sexes of rats. NCI stated that the PCB, Aroclor 1254, was not carcinogenic under the conditions of their bioassay. There is sufficient evidence in the scientific literature to conclude that Aroclor 1260 can cause liver cancer when fed to rodents at high doses. Similar experiments with less chlorinated PCB products have produced negative or equivocal results.

The consistent finding in animal studies is that PCBs produce liver injury following prolonged and repeated exposure by any route, if the exposure is of sufficient degree and duration. Liver injury is produced first, and by exposures that are less than those reported to cause cancer in rodents. Therefore, exposure by all routes should be kept sufficiently low to prevent liver injury.

Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed population, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Seventh Annual Report on Carcinogens.

## 12. ECOLOGICAL INFORMATION

Care should be taken to prevent entry of PCBs into the environment through spills, leakage, use, vaporization or disposal of liquid or solids. PCBs can accumulate in the environment and can adversely affect some animals and aquatic life. In general, PCBs have low solubility in water, are strongly bound to soils and sediments, and are slowly degraded by natural processes in the environment.

## 13. DISPOSAL CONSIDERATIONS

The disposal of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB wastes is strictly regulated by 40 CFR Part 761. For example, all wastes and residues containing PCBs (wiping cloths, absorbent material, used disposable protective gloves and clothing, etc.) should be collected, placed in proper containers, marked and disposed of in the manner prescribed by EPA regulations (40 CFR Part 761) and applicable state and local regulations.

## 14. TRANSPORT INFORMATION

The data provided in this section are for information only. Please apply the appropriate regulations to properly classify a shipment for transportation.

DOT Classification:	IF WEIGHT OF PCBs TO BE SHIPPED IS OVER ONE POUND, THE FOLLOWING CLASSIFICATION AND LABEL APPLY.
DOT Label:	LIQUID: Environmentally Hazardous Substance, liquid, n.o.s. (Contains PCB), 9, UN 3082, III
	SOLID: Environmentally Hazardous Substance, solid, n.o.s. (Contains PCB), 9, UN 3077, III
DOT Label:	Class: 9
DOT Reportable Quantity:	One Pound
IMO Classification:	Polychlorinated Biphenyls, IMO Class 9, UN 2315, II IMO Page 9034, EMS 6.1-02
IATA/ICAO Classification:	Polychlorinated Biphenyls, 9, UN2315, II

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**15. REGULATORY INFORMATION**

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For regulatory purposes, under the Toxic Substances Control Act, the term "PCBs" refers to a chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contain such a substance (40 CFR Part 761).

TSCA Inventory: not listed.

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate, Delayed.  
SARA Section 313 Toxic Chemical(s): Listed-1993 (De Minimis concentration 0.1%.)

Reportable Quantity (RQ) under DOT (49 CFR) and CERCLA Regulations: 1 lb. (polychlorinated biphenyls) PCBs.

Release of more than 1 (one) pound of PCBs to the environment requires notification to the National Response Center (800-424-8802 or 202-426-2675).

Various state and local regulations may require immediate reporting of PCB spills and may also define spill cleanup levels. Consult your attorney or appropriate regulatory officials for information relating to spill reporting and spill cleanup.

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**16. OTHER INFORMATION**

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Reason for revision: Conversion to the 16 section format. Supersedes MSDS dated 10/88.

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Inerteen® is a registered trademark of Westinghouse Electric Corporation

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Director, Environmental Affairs

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(314) 694-3344

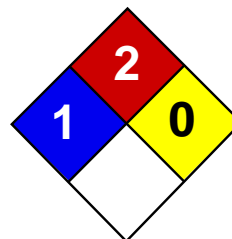
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Health	2
Fire	2
Reactivity	0
Personal Protection	J

## Material Safety Data Sheet p-Cymene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** p-Cymene

**Catalog Codes:** SLC4330

**CAS#:** 99-87-6

**RTECS:** GZ5950000

**TSCA:** TSCA 8(b) inventory: p-Cymene

**CI#:** Not available.

**Synonym:** 1-Methyl-4-isopropylbenzene; 4-Isopropyl-1-methylbenzene; Benzene, 1-isopropyl-4-methyl-; Camphogen; Cumene, p-methyl-; Cymene; Cymol; Dolcymene; p-Isopropylmethylbenzene; p-Isopropyltoluene; p-Methylisopropyl benzene; Paracymene; Paracymol

**Chemical Name:** p-Cymene

**Chemical Formula:** C<sub>10</sub>H<sub>14</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{p-}Cymene	99-87-6	100

**Toxicological Data on Ingredients:** p-Cymene: ORAL (LD50): Acute: 4750 mg/kg [Rat]. 3669 mg/kg [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 436°C (816.8°F)

**Flash Points:** CLOSED CUP: 47.222°C (117°F).

**Flammable Limits:** LOWER: 0.7% UPPER: 5.6%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Flammable in presence of open flames and sparks, of heat.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:** When heated to decomposition it emits acrid smoke and irritating fumes.

**Special Remarks on Explosion Hazards:** Explosion hazard is slight in the form of vapor.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Flammable liquid, insoluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

## Section 7: Handling and Storage



**Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

**Storage:**

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

**Section 8: Exposure Controls/Personal Protection****Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:** Splash goggles. Lab coat. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:** Not available.

**Section 9: Physical and Chemical Properties**

**Physical state and appearance:** Liquid.

**Odor:** Sweetish. Aromatic. Pleasant.

**Taste:** Not available.

**Molecular Weight:** 134.22 g/mole

**Color:** Colorless. Clear

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 177.1°C (350.8°F)

**Melting Point:** -68.9 (-92°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.861 (Water = 1)

**Vapor Pressure:** Not available.

**Vapor Density:** 4.62 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** The product is more soluble in oil;  $\log(\text{oil/water}) = 4.1$

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether, acetone.

**Solubility:**

Soluble in diethyl ether, acetone. Insoluble in cold water. Soluble in alcohol (ethanol), benzene.

**Section 10: Stability and Reactivity Data**

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources, incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Not available.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Eye contact. Inhalation.

**Toxicity to Animals:** Acute oral toxicity (LD50): 3669 mg/kg [Rat].

**Chronic Effects on Humans:** May cause damage to the following organs: central nervous system (CNS).

**Other Toxic Effects on Humans:**

Hazardous in case of skin contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:**

Lethal Dose/Conc 50% Kill: LD50 [Mouse] - Route: Inhalation; Dose: 19500 mg/m<sup>3</sup>

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Causes skin irritation. Symptoms can include erythema, dryness and defatting. It can be absorbed through the skin. Eyes: Contact with liquid causes eye irritation. Vapors are not irritating to the eyes. Inhalation: Vapors are not irritating to the throat. Inhalation of a high concentration of vapors may affect behavior/central nervous system and cause drowsiness, central nervous system depression, unconsciousness. Ingestion: Causes nausea, vomiting, hypermotility, diarrhea. May also affect behavior/central nervous system (somnolence, headache). Aspiration into the lungs may cause chemical pneumonitis. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause defatting of the skin and dermatitis.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Cymene UNNA: 2046 PG: III

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

Pennsylvania RTK: p-Cymene Massachusetts RTK: p-Cymene Massachusetts spill list: p-Cymene TSCA 8(b) inventory: p-Cymene

### Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

### Other Classifications:

### WHMIS (Canada):

CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

### DSCL (EEC):

R10- Flammable. R36/38- Irritating to eyes and skin. S16- Keep away from sources of ignition - No smoking. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37- Wear suitable protective clothing and gloves.

### HMIS (U.S.A.):

**Health Hazard:** 2

**Fire Hazard:** 2

**Reactivity:** 0

**Personal Protection:** j

### National Fire Protection Association (U.S.A.):

**Health:** 1

**Flammability:** 2

**Reactivity:** 0

**Specific hazard:**

### Protective Equipment:

Gloves. Lab coat. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.



**Created:** 10/09/2005 05:03 PM

**Last Updated:** 05/21/2013 12:00 PM

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# Material Safety Data Sheet

<b>NFPA</b>  	<b>HMIS</b>  <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #00FFFF;">Health Hazard</td> <td style="text-align: center; border: 1px solid black;">2</td> </tr> <tr> <td style="background-color: #FFCCCC;">Fire Hazard</td> <td style="text-align: center; border: 1px solid black;">2</td> </tr> <tr> <td style="background-color: #FFFF00;">Reactivity</td> <td style="text-align: center; border: 1px solid black;">0</td> </tr> </table>	Health Hazard	2	Fire Hazard	2	Reactivity	0	<b>Personal Protective Equipment</b>    See Section 15.
Health Hazard	2							
Fire Hazard	2							
Reactivity	0							

Section 1. Chemical Product and Company Identification		Page Number: 1
<b>Common Name/Trade Name</b>	<b>sec-Butylbenzene</b>	
	<b>Catalog Number(s)</b>	B2384
	<b>CAS#</b>	135-98-8
<b>Manufacturer</b>	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248	
	<b>RTECS</b>	CY9100000
	<b>TSCA</b>	TSCA 8(b) inventory: sec-Butylbenzene
<b>Commercial Name(s)</b>	Not available.	
	<b>CI#</b>	Not available.
<b>Synonym</b>	Benzene, (1-methylpropyl)-; 2-Phenylbutane; (1-Methylpropyl)benzene	
<b>Chemical Name</b>	Benzene, sec-butyl	
<b>Chemical Family</b>	Not available.	
<b>Chemical Formula</b>	C10-H14	
<b>Supplier</b>	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248	
	<b><u>IN CASE OF EMERGENCY</u></b> <b><u>CHEMTREC (24hr) 800-424-9300</u></b>  CALL (310) 516-8000	

Section 2. Composition and Information on Ingredients					
Name	CAS #	Exposure Limits			% by Weight
1) {sec-}Butylbenzene	135-98-8	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )	CEIL (mg/m <sup>3</sup> )	100
<b>Toxicological Data on Ingredients</b>	<b>sec-Butylbenzene:</b> ORAL (LD50): Acute: 6300 mg/kg [Rat]. 8700 mg/kg [Mouse].				

Section 3. Hazards Identification	
<b>Potential Acute Health Effects</b>	Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, .
<b>Potential Chronic Health Effects</b>	<b>CARCINOGENIC EFFECTS:</b> Not available. <b>MUTAGENIC EFFECTS:</b> Not available. <b>TERATOGENIC EFFECTS:</b> Not available. <b>DEVELOPMENTAL TOXICITY:</b> Not available. The substance may be toxic to central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

**Section 4. First Aid Measures**

<b>Eye Contact</b>	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.
<b>Skin Contact</b>	In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
<b>Serious Skin Contact</b>	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.
<b>Inhalation</b>	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
<b>Serious Inhalation</b>	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.
<b>Ingestion</b>	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.
<b>Serious Ingestion</b>	Not available.

**Section 5. Fire and Explosion Data**

<b>Flammability of the Product</b>	Flammable.
<b>Auto-Ignition Temperature</b>	415°C (779°F)
<b>Flash Points</b>	CLOSED CUP: 45°C (113°F) - 52 C(126 F)
<b>Flammable Limits</b>	LOWER: 0.8% UPPER: 6.9%
<b>Products of Combustion</b>	These products are carbon oxides (CO, CO2).
<b>Fire Hazards in Presence of Various Substances</b>	Flammable in presence of open flames and sparks, of heat.
<b>Explosion Hazards in Presence of Various Substances</b>	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.
<b>Fire Fighting Media and Instructions</b>	Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.
<b>Special Remarks on Fire Hazards</b>	Vapor may travel considerable distance to source of ignition and flash back. Vapors may form explosive mixtures with air.
<b>Special Remarks on Explosion Hazards</b>	Not available.

**Section 6. Accidental Release Measures**

<b>Small Spill</b>	Absorb with an inert material and put the spilled material in an appropriate waste disposal.
<b>Large Spill</b>	Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed.

**Section 7. Handling and Storage**

<b>Precautions</b>	Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.
<b>Storage</b>	Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

**Section 8. Exposure Controls/Personal Protection**

<b>Engineering Controls</b>	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
<b>Personal Protection</b>	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
<b>Personal Protection in Case of a Large Spill</b>	Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
<b>Exposure Limits</b>	Not available.

**Section 9. Physical and Chemical Properties**

<b>Physical state and appearance</b>	Liquid.	<b>Odor</b>	Not available.
<b>Molecular Weight</b>	13.22 g/mole	<b>Taste</b>	Not available.
<b>pH (1% soln/water)</b>	Not available.	<b>Color</b>	Clear Colorless.
<b>Boiling Point</b>	173°C (343.4°F)		
<b>Melting Point</b>	Melting Point: -82.7°C (-116.9°F) Freezing point: -75.68 C.		
<b>Critical Temperature</b>	Not available.		
<b>Specific Gravity</b>	0.858 - 0.8630(Water = 1)		
<b>Vapor Pressure</b>	0.2 kPa (@ 25°C)		
<b>Vapor Density</b>	4.62 (Air = 1)		
<b>Volatility</b>	Not available.		
<b>Odor Threshold</b>	Not available.		
<b>Water/Oil Dist. Coeff.</b>	The product is more soluble in oil; log(oil/water) = 4.6		
<b>Ionicity (in Water)</b>	Not available.		
<b>Dispersion Properties</b>	Not available.		
<b>Solubility</b>	Very slightly soluble in cold water. Solubility in Water: 17.6 mg/l @ 25 deg. C; 15 mg/l @ 20 C.		

**Section 10. Stability and Reactivity Data**

<b>Stability</b>	The product is stable.
<b>Instability Temperature</b>	Not available.
<b>Conditions of Instability</b>	Heat, ignition sources (sparks, flames), incompatible materials
<b>Incompatibility with various substances</b>	Reactive with oxidizing agents.
<b>Corrosivity</b>	Not available.

<b>Special Remarks on Reactivity</b>	Not available.
<b>Special Remarks on Corrosivity</b>	Not available.
<b>Polymerization</b>	Will not occur.

**Section 11. Toxicological Information**

<b>Routes of Entry</b>	Absorbed through skin. Eye contact. Inhalation.
<b>Toxicity to Animals</b>	Acute oral toxicity (LD50): 6300 mg/kg [Rat].
<b>Chronic Effects on Humans</b>	May cause damage to the following organs: central nervous system (CNS).
<b>Other Toxic Effects on Humans</b>	Hazardous in case of skin contact (irritant), of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, .
<b>Special Remarks on Toxicity to Animals</b>	LD50 [Rat] - Route: Oral; Dose: 2240 ul/kg LD50[Rabbit] - Route: Skin; Dose: >16 ml/kg
<b>Special Remarks on Chronic Effects on Humans</b>	Not available.
<b>Special Remarks on other Toxic Effects on Humans</b>	Acute Potential Health Effects: Skin: Causes skin irritation. Eyes: Causes eye irritation. Inhalation: Causes respiratory tract irritation. Inhalation of large amounts of vapors may cause dizziness or suffocation. Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea. May affect behavior/central nervous system (CNS depression). Chronic Potential Health Effects: Ingestion: Prolonged or repeated ingestion may affect behavior/central nervous system, liver, urinary system,spleen. Skin: Prolonged or repeated skin contact may casue dermatitis.

**Section 12. Ecological Information**

<b>Ecotoxicity</b>	Not available.
<b>BOD5 and COD</b>	Not available.
<b>Products of Biodegradation</b>	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
<b>Toxicity of the Products of Biodegradation</b>	The product itself and its products of degradation are not toxic.
<b>Special Remarks on the Products of Biodegradation</b>	Not available.

**Section 13. Disposal Considerations**

<b>Waste Disposal</b>	Waste must be disposed of in accordance with federal, state and local environmental control regulations.
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**Section 14. Transport Information**

<b>DOT Classification</b>	CLASS 3: Flammable liquid.
<b>Identification</b>	UNNA: 2709: Butylbenzene PG: III
<b>Special Provisions for Transport</b>	Marine Pollutant



DOT (Pictograms)



**Section 15. Other Regulatory Information and Pictograms**

**Federal and State Regulations**

Pennsylvania RTK: sec-Butylbenzene  
 Massachusetts RTK: sec-Butylbenzene  
 TSCA 8(b) inventory: sec-Butylbenzene  
 TSCA 8(d) H and S data reporting: sec-Butylbenzene: Effective date: 6/1/-87; Sunset date: 12/19/95

**California Proposition 65 Warnings**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.  
 California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

**Other Regulations**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).  
 EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances (EINECS No. 205-227-0).  
 Canada: Listed on Canadian Domestic Substance List (DSL).  
 China: Listed on National Inventory.  
 Japan: Listed on National Inventory (ENCS).  
 Korea: Listed on National Inventory (KECI).  
 Philippines: Listed on National Inventory (PICCS).  
 Australia: Listed on AICS.

**Other Classifications**

<b>WHMIS (Canada)</b>	CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).										
<b>DSCL (EEC)</b>	<table border="0"> <tr> <td>R10- Flammable.</td> <td>S9- Keep container in a well-ventilated place.</td> </tr> <tr> <td>R36/37/38- Irritating to eyes, respiratory system and skin.</td> <td>S16- Keep away from sources of ignition - No smoking.</td> </tr> <tr> <td></td> <td>S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</td> </tr> <tr> <td></td> <td>S33- Take precautionary measures against static discharges.</td> </tr> <tr> <td></td> <td>S37- Wear suitable gloves.</td> </tr> </table>	R10- Flammable.	S9- Keep container in a well-ventilated place.	R36/37/38- Irritating to eyes, respiratory system and skin.	S16- Keep away from sources of ignition - No smoking.		S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.		S33- Take precautionary measures against static discharges.		S37- Wear suitable gloves.
R10- Flammable.	S9- Keep container in a well-ventilated place.										
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	S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.										
	S33- Take precautionary measures against static discharges.										
	S37- Wear suitable gloves.										

**HMIS (U.S.A.)**

Health Hazard	2
Fire Hazard	2
Reactivity	0
Personal Protection	h

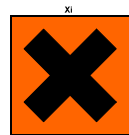
**National Fire Protection Association (U.S.A.)**

Health		Flammability Reactivity Specific hazard
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**WHMIS (Canada) (Pictograms)**



**DSCL (Europe) (Pictograms)**



**TDG (Canada) (Pictograms)**



**ADR (Europe)  
(Pictograms)**



**Protective Equipment**



Gloves.



Lab coat.



Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.



Splash goggles.

**Section 16. Other Information**

**MSDS Code** 6465B

**References** Not available.

**Other Special Considerations** Major Uses: Solvent for coating compositions; Organic synthesis; plasticizer; surface active agents

Validated by Sonia Owen on 8/14/2009.

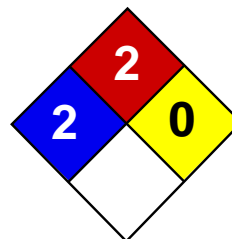
Verified by Sonia Owen.

Printed 8/21/2009.

CALL (310) 516-8000

**Notice to Reader**

*All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.*



Health	2
Fire	2
Reactivity	0
Personal Protection	A

## Material Safety Data Sheet tert-Butylbenzene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** tert-Butylbenzene

**Catalog Codes:** SLB4126

**CAS#:** 98-06-6

**RTECS:** CY9120000

**TSCA:** TSCA 8(b) inventory: tert-Butylbenzene

**CI#:** Not available.

**Synonym:** 2-Methyl-2-phenylpropane

**Chemical Name:** Not available.

**Chemical Formula:** C<sub>6</sub>H<sub>5</sub>C(CH<sub>3</sub>)<sub>3</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
{tert-}Butylbenzene	98-06-6	100

**Toxicological Data on Ingredients:** tert-Butylbenzene: ORAL (LD50): Acute: 500 mg/kg [Rat].

### Section 3: Hazards Identification

**Potential Acute Health Effects:** No specific information is available in our database regarding the acute toxic effects of this material for humans.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 450°C (842°F)

**Flash Points:** CLOSED CUP: 60°C (140°F).

**Flammable Limits:** LOWER: 0.8% UPPER: 5.8%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:** Not available.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

### Section 7: Handling and Storage

**Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label.

**Storage:**

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

### Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:** Safety glasses. Lab coat.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:** Not available.

### Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Aromatic. Benzene-like.

**Taste:** Not available.

**Molecular Weight:** 134.228 g/mole

**Color:** Clear Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 169°C (336.2°F)

**Melting Point:** -58°C (-72.4°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 0.87 (Water = 1)

**Vapor Pressure:** 0.2 kPa (@ 20°C)

**Vapor Density:** 4.62 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:** Insoluble in cold water, hot water.

### Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

### Section 11: Toxicological Information

**Routes of Entry:** Not available.

**Toxicity to Animals:** Acute oral toxicity (LD50): 500 mg/kg [Rat].

**Chronic Effects on Humans:** Not available.

**Other Toxic Effects on Humans:** No specific information is available in our database regarding the other toxic effects of this material for humans.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are more toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information

**DOT Classification:**

CLASS 3: Flammable liquid. CLASS 6.1: Poisonous material.

**Identification:** : FLAMMABLE LIQUIDS, POISONOUS, N.O.S. UNNA: UN1992 PG: III

**Special Provisions for Transport:** Not available.

### Section 15: Other Regulatory Information

**Federal and State Regulations:**

Pennsylvania RTK: tert-Butylbenzene Florida: tert-Butylbenzene Massachusetts RTK: tert-Butylbenzene TSCA 8(b) inventory: tert-Butylbenzene TSCA 8(d) H and S data reporting: tert-Butylbenzene: 6/1/85

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:****WHMIS (Canada):**

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).

**DSCL (EEC):** R22- Harmful if swallowed.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 2

**Reactivity:** 0

**Personal Protection:** a

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 2

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Not applicable. Lab coat. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 04:28 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

## SAFETY DATA SHEET

Creation Date 28-May-2009

Revision Date 17-Jan-2018

Revision Number 3

### 1. Identification

**Product Name** tert-Butyl methyl ether

**Cat No. :** E127-4; XXE127RS200; NC1240503

**CAS-No** 1634-04-4  
**Synonyms** 2-Methyl-2-methoxy propane; MTBE; Methyl tert-butyl ether

**Recommended Use** Laboratory chemicals.  
**Uses advised against** Not for food, drug, pesticide or biocidal product use

#### Details of the supplier of the safety data sheet

##### Company

Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

##### **Emergency Telephone Number**

CHEMTREC®, Inside the USA: 800-424-9300  
CHEMTREC®, Outside the USA: 001-703-527-3887

### 2. Hazard(s) identification

#### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Skin Corrosion/irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Lungs.	

#### Label Elements

##### **Signal Word**

Danger

##### **Hazard Statements**

Highly flammable liquid and vapor  
Causes skin irritation  
May cause respiratory irritation



**Precautionary Statements****Prevention**

Wash face, hands and any exposed skin thoroughly after handling  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Use only outdoors or in a well-ventilated area  
 Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
 Keep container tightly closed  
 Ground/bond container and receiving equipment  
 Use explosion-proof electrical/ventilating/lighting/equipment  
 Use only non-sparking tools  
 Take precautionary measures against static discharge  
 Keep cool  
 Avoid breathing dust/fume/gas/mist/vapors/spray

**Response**

Get medical attention/advice if you feel unwell

**Inhalation**

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
 Call a POISON CENTER or doctor/physician if you feel unwell

**Skin**

If skin irritation occurs: Get medical advice/attention  
 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 Wash contaminated clothing before reuse

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
 If eye irritation persists: Get medical advice/attention

**Fire**

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam for extinction

**Storage**

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

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)****Other hazards**

Aspiration hazard if swallowed - can enter lungs and cause damage.

### 3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Methyl tert-butyl ether	1634-04-4	>95

### 4. First-aid measures

<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

<b>Inhalation</b>	Move to fresh air. Get medical attention immediately if symptoms occur. If not breathing, give artificial respiration.
<b>Ingestion</b>	Do not induce vomiting. Obtain medical attention.
<b>Most important symptoms and effects</b>	Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
<b>Notes to Physician</b>	Treat symptomatically

## 5. Fire-fighting measures

<b>Suitable Extinguishing Media</b>	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.
<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	-28 °C / -18.4 °F
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	224 °C / 435.2 °F
<b>Explosion Limits</b>	
<b>Upper</b>	15.1 vol %
<b>Lower</b>	1.6 vol %
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

### Specific Hazards Arising from the Chemical

Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

### Hazardous Combustion Products

Carbon monoxide (CO) Carbon dioxide (CO<sub>2</sub>)

### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

### NFPA

<b>Health</b>	<b>Flammability</b>	<b>Instability</b>	<b>Physical hazards</b>
2	3	0	N/A

## 6. Accidental release measures

<b>Personal Precautions</b>	Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Ensure adequate ventilation.
<b>Environmental Precautions</b>	Should not be released into the environment. See Section 12 for additional ecological information.
<b>Methods for Containment and Clean Up</b>	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

## 7. Handling and storage

<b>Handling</b>	Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use explosion-proof equipment. Take precautionary measures against static discharges. Use only under a chemical fume hood. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.
<b>Storage</b>	Flammables area. Keep away from heat and sources of ignition. Keep container tightly

closed in a dry and well-ventilated place. May form explosive peroxides on prolonged storage.

## 8. Exposure controls / personal protection

### Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Methyl tert-butyl ether	TWA: 50 ppm			

### Legend

ACGIH - American Conference of Governmental Industrial Hygienists

**Engineering Measures** Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment.

### Personal Protective Equipment

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection** Wear appropriate protective gloves and clothing to prevent skin exposure.

**Respiratory Protection** No protective equipment is needed under normal use conditions.

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

<b>Physical State</b>	Liquid
<b>Appearance</b>	Colorless
<b>Odor</b>	Petroleum distillates
<b>Odor Threshold</b>	No information available
<b>pH</b>	No information available
<b>Melting Point/Range</b>	-110 °C / -166 °F
<b>Boiling Point/Range</b>	54 - 56 °C / 129.2 - 132.8 °F
<b>Flash Point</b>	-28 °C / -18.4 °F
<b>Evaporation Rate</b>	No information available
<b>Flammability (solid,gas)</b>	Not applicable
<b>Flammability or explosive limits</b>	
<b>Upper</b>	15.1 vol %
<b>Lower</b>	1.6 vol %
<b>Vapor Pressure</b>	268 mbar @ 20 °C
<b>Vapor Density</b>	0.2
<b>Specific Gravity</b>	0.740
<b>Solubility</b>	Slightly soluble in water
<b>Partition coefficient; n-octanol/water</b>	No data available
<b>Autoignition Temperature</b>	224 °C / 435.2 °F
<b>Decomposition Temperature</b>	No information available
<b>Viscosity</b>	0.36 mPa.s at 20 °C
<b>Molecular Formula</b>	C5 H12 O
<b>Molecular Weight</b>	88.15

## 10. Stability and reactivity

**Reactive Hazard** None known, based on information available

<b>Stability</b>	Stable under normal conditions.
<b>Conditions to Avoid</b>	Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.
<b>Incompatible Materials</b>	Strong oxidizing agents
<b>Hazardous Decomposition Products</b>	Carbon monoxide (CO), Carbon dioxide (CO <sub>2</sub> )
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.
<b>Hazardous Reactions</b>	None under normal processing.

## 11. Toxicological information

### Acute Toxicity

#### Product Information

#### Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Methyl tert-butyl ether	LD50 = 2963 mg/kg ( Rat )	LD50 = 10000 mg/kg ( Rabbit )	LC50 = 23576 ppm ( Rat ) 4 h

**Toxicologically Synergistic Products** No information available

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

<b>Irritation</b>	Irritating to eyes and skin
<b>Sensitization</b>	No information available
<b>Carcinogenicity</b>	The table below indicates whether each agency has listed any ingredient as a carcinogen. Limited evidence of a carcinogenic effect.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Methyl tert-butyl ether	1634-04-4	Not listed	Not listed	A3	Not listed	Not listed

ACGIH: (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen  
 A2 - Suspected Human Carcinogen  
 A3 - Animal Carcinogen  
 ACGIH: (American Conference of Governmental Industrial Hygienists)

<b>Mutagenic Effects</b>	Mutagenic effects have occurred in experimental animals.
<b>Reproductive Effects</b>	No information available.
<b>Developmental Effects</b>	No information available.
<b>Teratogenicity</b>	No information available.
<b>STOT - single exposure</b>	Lungs
<b>STOT - repeated exposure</b>	None known
<b>Aspiration hazard</b>	No information available

**Symptoms / effects, both acute and delayed** Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

#### Endocrine Disruptor Information

Component	EU - Endocrine Disruptors Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Methyl tert-butyl ether	Group III Chemical	Not applicable	Not applicable

**Other Adverse Effects** Tumorigenic effects have been reported in experimental animals.

## 12. Ecological information

### Ecotoxicity

Do not empty into drains. .

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Methyl tert-butyl ether	800 mg/L EC50 > 72 h 184 mg/L EC50 = 96 h	887 mg/L LC50 96 h 100 mg/L LC50 96 h 929 mg/L LC50 96 h 672 mg/L LC50 96 h	EC50 = 11.4 mg/L 30 min EC50 = 8.23 mg/L 5 min EC50 = 9.67 mg/L 15 min	EC50: = 542 mg/L, 48h (Daphnia magna)

**Persistence and Degradability** Persistence is unlikely based on information available.

**Bioaccumulation/ Accumulation** No information available.

**Mobility** Will likely be mobile in the environment due to its volatility.

Component	log Pow
Methyl tert-butyl ether	1.06

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

### DOT

UN-No UN2398  
 Proper Shipping Name METHYL tert-BUTYL ETHER  
 Hazard Class 3  
 Packing Group II

### TDG

UN-No UN2398  
 Proper Shipping Name METHYL tert-BUTYL ETHER  
 Hazard Class 3  
 Packing Group II

### IATA

UN-No UN2398  
 Proper Shipping Name METHYL tert-BUTYL ETHER  
 Hazard Class 3  
 Packing Group II

### IMDG/IMO

UN-No UN2398  
 Proper Shipping Name METHYL tert-BUTYL ETHER  
 Hazard Class 3  
 Packing Group II

## 15. Regulatory information

### International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Methyl tert-butyl ether	X	X	-	216-653-1	-		X	X	X	X	X

#### Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

### U.S. Federal Regulations

**TSCA 12(b)** Not applicable

#### **SARA 313**

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Methyl tert-butyl ether	1634-04-4	>95	1.0

**SARA 311/312 Hazard Categories** See section 2 for more information

**CWA (Clean Water Act)** Not applicable

#### **Clean Air Act**

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Methyl tert-butyl ether	X		-

**OSHA Occupational Safety and Health Administration**

Not applicable

#### **CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Methyl tert-butyl ether	1000 lb	-

**California Proposition 65** This product does not contain any Proposition 65 chemicals

### **U.S. State Right-to-Know Regulations**

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Methyl tert-butyl ether	X	X	X	X	-

### **U.S. Department of Transportation**

Reportable Quantity (RQ): Y  
 DOT Marine Pollutant N  
 DOT Severe Marine Pollutant N

### **U.S. Department of Homeland Security**

This product does not contain any DHS chemicals.

### Other International Regulations

**Mexico - Grade** Serious risk, Grade 3

## 16. Other information

**Prepared By** Regulatory Affairs  
 Thermo Fisher Scientific  
 Email: EMSDS.RA@thermofisher.com

**Creation Date** 28-May-2009

**Revision Date** 17-Jan-2018

**Print Date**

17-Jan-2018

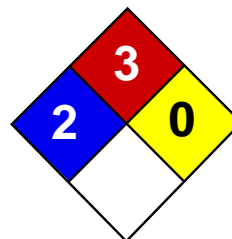
**Revision Summary**

This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**



Health	2
Fire	3
Reactivity	0
Personal Protection	H

## Material Safety Data Sheet Toluene MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Toluene

**Catalog Codes:** SLT2857, SLT3277

**CAS#:** 108-88-3

**RTECS:** XS5250000

**TSCA:** TSCA 8(b) inventory: Toluene

**CI#:** Not available.

**Synonym:** Toluol, Tolu-Sol; Methylbenzene; Methacide; Phenylmethane; Methylbenzol

**Chemical Name:** Toluene

**Chemical Formula:** C6-H5-CH3 or C7-H8

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Toluene	108-88-3	100

**Toxicological Data on Ingredients:** Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m 4 hours [Rat]. 440 ppm 24 hours [Mouse].

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures



**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

## Section 5: Fire and Explosion Data

**Flammability of the Product:** Flammable.

**Auto-Ignition Temperature:** 480°C (896°F)

**Flash Points:** CLOSED CUP: 4.4444°C (40°F). (Setaflash) OPEN CUP: 16°C (60.8°F).

**Flammable Limits:** LOWER: 1.1% UPPER: 7.1%

**Products of Combustion:** These products are carbon oxides (CO, CO<sub>2</sub>).

**Fire Hazards in Presence of Various Substances:**

Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:**

Flammable liquid, insoluble in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:**

Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolididione; dinitrogen tetraoxide; concentrated nitric acid, sulfuric acid + nitric acid; N<sub>2</sub>O<sub>4</sub>; AgClO<sub>4</sub>; BrF<sub>3</sub>; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

## Section 6: Accidental Release Measures

**Small Spill:** Absorb with an inert material and put the spilled material in an appropriate waste disposal.

**Large Spill:**

Toxic flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Section 7: Handling and Storage****Precautions:**

Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

**Storage:**

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

**Section 8: Exposure Controls/Personal Protection****Engineering Controls:**

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection:**

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States] TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 100 STEL: 150 from NIOSH [United States] TWA: 375 STEL: 560 (mg/m<sup>3</sup>) from NIOSH [United States] Consult local authorities for acceptable exposure limits.

**Section 9: Physical and Chemical Properties**

**Physical state and appearance:** Liquid.

**Odor:** Sweet, pungent, Benzene-like.

**Taste:** Not available.

**Molecular Weight:** 92.14 g/mole

**Color:** Colorless.

**pH (1% soln/water):** Not applicable.

**Boiling Point:** 110.6°C (231.1°F)

**Melting Point:** -95°C (-139°F)

**Critical Temperature:** 318.6°C (605.5°F)

**Specific Gravity:** 0.8636 (Water = 1)

**Vapor Pressure:** 3.8 kPa (@ 25°C)

**Vapor Density:** 3.1 (Air = 1)

**Volatility:** Not available.

**Odor Threshold:** 1.6 ppm

**Water/Oil Dist. Coeff.:** The product is more soluble in oil;  $\log(\text{oil/water}) = 2.7$

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether, acetone.

**Solubility:**

Soluble in diethyl ether, acetone. Practically insoluble in cold water. Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide. Solubility in water: 0.561 g/l @ 25 deg. C.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Heat, ignition sources (flames, sparks, static), incompatible materials

**Incompatibility with various substances:** Reactive with oxidizing agents.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride. Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg. C. Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 636 mg/kg [Rat]. Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

**Other Toxic Effects on Humans:**

Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:**

Lowest Published Lethal Dose: LDL [Human] - Route: Oral; Dose: 50 mg/kg LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

**Special Remarks on Chronic Effects on Humans:**

Detected in maternal milk in human. Passes through the placental barrier in human. Embryotoxic and/or foetotoxic in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin. Eyes: Causes mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abrasions. This usually resolves in 2 days. Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia, ), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite. Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation. Chronic Potential Health Effects: Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophosphatemia), severe, muscle weakness and Rhabdomyolysis. Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

## Section 12: Ecological Information

### Ecotoxicity:

Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

**BOD5 and COD:** Not available.

### Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

### Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## Section 14: Transport Information

**DOT Classification:** CLASS 3: Flammable liquid.

**Identification:** : Toluene UNNA: 1294 PG: II

**Special Provisions for Transport:** Not available.

## Section 15: Other Regulatory Information

### Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene California prop. 65 (no significant risk level): Toluene: 7 mg/day (value) California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene Connecticut hazardous material survey.: Toluene Illinois

toxic substances disclosure to employee act: Toluene Illinois chemical safety act: Toluene New York release reporting list: Toluene Rhode Island RTK hazardous substances: Toluene Pennsylvania RTK: Toluene Florida: Toluene Minnesota: Toluene Michigan critical material: Toluene Massachusetts RTK: Toluene Massachusetts spill list: Toluene New Jersey: Toluene New Jersey spill list: Toluene Louisiana spill reporting: Toluene California Director's List of Hazardous Substances.: Toluene TSCA 8(b) inventory: Toluene TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/0/92 SARA 313 toxic chemical notification and release reporting: Toluene CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):**

R11- Highly flammable. R20- Harmful by inhalation. S16- Keep away from sources of ignition - No smoking. S25- Avoid contact with eyes. S29- Do not empty into drains. S33- Take precautionary measures against static discharges.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 3

**Reactivity:** 0

**Personal Protection:** h

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 3

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:30 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

**Safety Data Sheet**

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

**Effective date:** 07.21.2015**Revision:** 07.21.2015**Trade Name:** Alconox**1 Identification of the substance/mixture and of the supplier****1.1 Product identifier****Trade Name:** Alconox**Synonyms:****Product number:** Alconox**1.2 Application of the substance / the mixture:** Cleaning material/Detergent**1.3 Details of the supplier of the Safety Data Sheet**

<b>Manufacturer</b>	<b>Supplier</b>
Alconox, Inc. 30 Glenn Street White Plains, NY 10603 914-948-4040	N/A

**Emergency telephone number:****ChemTel: (24-hour)**

(800) 255-3924

**2 Hazards identification****2.1 Classification of the substance or mixture:**

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

**Hazard-determining components of labeling:**

Sodium Alkylbenzene Sulfonate

**2.2 Label elements:**

Eye irritation, category 2B

**Hazard pictograms:** None**Signal word:** Warning**Hazard statements:**

H320 Causes eye irritation.

**Precautionary statements:**

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+352 IF ON SKIN: Wash with soap and water.

P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P403+233 Store in a well ventilated place. Keep container tightly closed.

P501 Dispose of contents and container as instructed in Section 13.

**Additional information:** None**Hazard description****Hazards Not Otherwise Classified (HNOC):** None**Information concerning particular hazards for humans and environment:**

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

**Classification system:**

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and

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amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

**3 Composition/information on ingredients**

- 3.1 Chemical characterization:** None
- 3.2 Description:** None
- 3.3 Hazardous components (percentages by weight):**

CAS / EINECS #	Ingredient Name	Wt. %
CAS # 68081-81-2	Sodium Alkylbenzene Sulfonate	10-25
CAS # 497-19-8	Sodium Carbonate	5-15
CAS # 7722-88-5	Tetrasodium pyrophosphate	5-15

- 3.4 Additional Information:** None

**4 First aid measures****4.1 Description of first aid measures**

**General information:** None

**After inhalation:**

Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical advice if discomfort or irritation persists. If breathing difficult, give oxygen.

**After skin contact:**

Wash affected area with soap and water. Rinse/flush exposed skin gently using water for 15-20 minutes. Seek medical advice if discomfort or irritation persists.

**After eye contact:**

Protect unexposed eye. Rinse/flush exposed eye(s) gently using water for 15-20 minutes. Remove contact lens(es) if able to do so during rinsing. Seek medical attention if irritation persists or if concerned.

**After swallowing:**

Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Seek medical attention if irritation, discomfort or vomiting persists.

**4.2 Most important symptoms and effects, both acute and delayed**

Irritation.  
Shortness of breath.

**4.3 Indication of any immediate medical attention and special treatment needed:**

If seeking medical attention provide SDS document to physician.  
Physician should treat symptomatically.

**5 Firefighting measures****5.1 Extinguishing media**

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**Trade Name: Alconox****Suitable extinguishing agents:**

Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

**For safety reasons unsuitable extinguishing agents:**

None identified.

**5.2 Special hazards arising from the substance or mixture:**

Thermal decomposition can lead to release of irritating gases and vapors.

**5.3 Advice for firefighters****Protective equipment:**

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**5.4 Additional information:**

Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols.

Avoid contact with skin, eyes, and clothing.

**6 Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures:**

Ensure adequate ventilation.

**6.2 Environmental precautions:** None**6.3 Methods and material for containment and cleaning up:**

Wear protective eyewear, gloves, and clothing. Refer to Section 8.

Keep in suitable closed containers for disposal. Refer to Section 13.

Always obey local regulations.

**6.4 Reference to other sections:** None**7 Handling and storage****7.1 Precautions for safe handling:**

Avoid contact with skin, eyes, and clothing.

Follow proper disposal methods. Refer to Section 13.

Do not eat, drink, smoke, or use personal products when handling chemical substances.

Avoid breathing mist, dust, or vapor.

Use only with adequate ventilation.

**7.2 Conditions for safe storage, including any incompatibilities:**

Keep away from food and beverages.

Provide ventilation for containers.

Keep container tightly sealed.

**7.3 Specific end use(s):**

No additional information.

**8 Exposure controls/personal protection**



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**8.1 Control parameters:** No applicable occupational exposure limits.

**8.2 Exposure controls****Appropriate Engineering controls:**

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

**Respiratory protection:**

Not required under normal conditions of use.

**Protection of skin:**

Select glove material impermeable and resistant to the substance.

Select glove material based on rates of diffusion and degradation.

Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices.

Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves.

Contact glove manufacturer for specific information.

Wear appropriate clothing to prevent any possibility of skin contact.

**Eye protection:**

Wear equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Safety glasses or goggles are appropriate eye protection.

**General hygienic measures:**

Avoid contact with skin, eyes, and clothing.

**9 Physical and chemical properties**

<b>Appearance (physical state, color):</b>	White and cream colored flakes	<b>Explosion limit lower:</b> <b>Explosion limit upper:</b>	Product does not present an explosion hazard. Not determined or not available.
<b>Odor:</b>	Odorless	<b>Vapor pressure at 20°C:</b>	Not determined or not available.
<b>Odor threshold:</b>	Not determined or not available.	<b>Vapor density:</b>	Not determined or not available.
<b>pH-value:</b>	9.5 aqueous	<b>Relative density:</b>	Not determined or not available.
<b>Melting/Freezing point:</b>	Not determined or not available.	<b>Solubilities:</b>	Solubility in water - 100%
<b>Boiling point/Boiling range:</b>	Not determined or not available.	<b>Partition coefficient (n-octanol/water):</b>	Not determined or not available.
<b>Flash point (closed cup):</b>	Not determined or not available.	<b>Auto/Self-ignition temperature:</b>	Product is not selfigniting.
<b>Evaporation rate:</b>	Not determined or not available.	<b>Decomposition temperature:</b>	Not determined or not available.

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<b>Trade Name:</b> Alconox			
<b>Flammability (solid, gaseous):</b>	Not determined or not available.	<b>Viscosity:</b>	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
<b>Density at 20°C:</b>	1,1 g/cm <sup>3</sup>		

**10 Stability and reactivity****10.1 Reactivity:**

Nonreactive under normal conditions.

**10.2 Chemical stability:**

Stable under normal conditions.

**10.3 Possibility hazardous reactions:**

None under normal processing.

**10.4 Conditions to avoid:**Excess heat.  
Moisture.**10.5 Incompatible materials:**

Strong oxidizing agents.

**10.6 Hazardous decomposition products:**No data available.  
Carbon monoxide and carbon dioxide Phosphorus compounds Sulphur oxides (SO<sub>x</sub>).**11 Toxicological information****11.1 Information on toxicological effects:****Acute Toxicity:** No additional information.**Chronic Toxicity:** No additional information.**Skin corrosion/irritation:**

Irritating to skin and mucous membranes.

**Serious eye damage/irritation:**

Irritant with the danger of eye injury.

**Respiratory or skin sensitization:** No additional information.**Carcinogenicity:** See section 15.**Germ cell mutagenicity:** No additional information.**Reproductive toxicity:** No additional information.**STOT-single and repeated exposure:** No additional information.**Additional toxicological information:** No additional information.

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**Trade Name:** Alconox**12 Ecological information****12.1 Toxicity:** No additional information.**12.2 Persistence and degradability:**

No data available.

**12.3 Bioaccumulative potential:**

No data available.

**12.4 Mobility in soil:**

No data available.

**General notes:** No additional information.**12.5 Results of PBT and vPvB assessment:****PBT:** No additional information.**vPvB:** No additional information.**12.6 Other adverse effects:**

None identified.

**13 Disposal considerations****13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)****Relevant Information:**

Dispose of empty containers as unused product. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Smaller quantities can be disposed of with household waste. Small amounts may be diluted with plenty of water and washed away.

**14 Transport information**

<b>14.1 UN Number:</b> ADR, ADN, DOT, IMDG, IATA	Not Regulated
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<b>14.2 UN Proper shipping name:</b> ADR, ADN, DOT, IMDG, IATA	Not Regulated.
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<b>14.3 Transport hazard classes:</b> ADR, ADN, DOT, IMDG, IATA	<b>Class:</b> None
	<b>Label:</b> None
	<b>LTD. QTY:</b> None

<b>US DOT</b>	
<b>Limited Quantity Exception:</b>	None

<b>Bulk:</b>	<b>Non Bulk:</b>
<b>RQ (if applicable):</b> None	<b>RQ (if applicable):</b> None
<b>Proper shipping Name:</b> Not Regulated.	<b>Proper shipping Name:</b> Not Regulated.
<b>Hazard Class:</b> None	<b>Hazard Class:</b> None
<b>Packing Group:</b> Not Applicable.	<b>Packing Group:</b> Not Applicable.

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<b>Marine Pollutant (if applicable):</b> No additional information. <b>Comments:</b> None	<b>Marine Pollutant (if applicable):</b> No additional information. <b>Comments:</b> None
<b>14.4 Packing group:</b> ADR, ADN, DOT, IMDG, IATA	Not Applicable.
<b>14.5 Environmental hazards:</b>	None
<b>14.6 Special precautions for user:</b> <b>Danger code (Kemler):</b> <b>EMS number:</b> <b>Segregation groups:</b>	None None None None
<b>14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:</b> Not applicable.	
<b>14.8 Transport/Additional information:</b>	
<b>Transport category:</b> <b>Tunnel restriction code:</b> <b>UN "Model Regulation":</b>	None None Not Regulated, Not Regulated

**15 Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.**  
North American

<b>SARA</b> <b>Section 313 (specific toxic chemical listings):</b> None of the ingredients are listed. <b>Section 302 (extremely hazardous substances):</b> None of the ingredients are listed.
<b>CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable</b> <b>Spill Quantity:</b> None of the ingredients are listed.
<b>TSCA (Toxic Substances Control Act):</b> <b>Inventory:</b> All ingredients are listed. <b>Rules and Orders:</b> Not applicable.
<b>NTP (National Toxicology Program):</b> None of the ingredients are listed.
<b>Proposition 65 (California):</b> <b>Chemicals known to cause cancer:</b> None of the ingredients are listed. <b>Chemicals known to cause reproductive toxicity for females:</b> None of the ingredients are listed. <b>Chemicals known to cause reproductive toxicity for males:</b> None of the ingredients are listed. <b>Chemicals known to cause developmental toxicity:</b> None of the ingredients are listed.
<b>Canadian</b> <b>Canadian Domestic Substances List (DSL):</b>

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All ingredients are listed.

**EU****REACH Article 57 (SVHC):** None of the ingredients are listed.**Germany MAK:** Not classified.**Asia Pacific****Australia****Australian Inventory of Chemical Substances (AICS):** All ingredients are listed.**China****Inventory of Existing Chemical Substances in China (IECSC):** All ingredients are listed.**Japan****Inventory of Existing and New Chemical Substances (ENCS):** All ingredients are listed.**Korea****Existing Chemicals List (ECL):** All ingredients are listed.**New Zealand****New Zealand Inventory of Chemicals (NZOIC):** All ingredients are listed.**Philippines****Philippine Inventory of Chemicals and Chemical Substances (PICCS):** All ingredients are listed.**Taiwan****Taiwan Chemical Substance Inventory (TSCI):** All ingredients are listed.**Carcinogenic Categories****IARC (International Agency for Research on Cancer):** None of the ingredients are listed.**16 Other information****Abbreviations and Acronyms:**

IMDG International Maritime Code for Dangerous Goods.  
 PNEC Predicted No-Effect Concentration (REACH).  
 CFR Code of Federal Regulations (USA).  
 SARA Superfund Amendments and Reauthorization Act (USA).  
 RCRA Resource Conservation and Recovery Act (USA).  
 TSCA Toxic Substances Control Act (USA).  
 NPRI National Pollutant Release Inventory (Canada).  
 DOT US Department of Transportation.  
 IATA International Air Transport Association.  
 GHS Globally Harmonized System of Classification and Labelling of Chemicals.  
 ACGIH American Conference of Governmental Industrial Hygienists.  
 CAS Chemical Abstracts Service (division of the American Chemical Society).  
 NFPA National Fire Protection Association (USA).  
 HMIS Hazardous Materials Identification System (USA).  
 WHMIS Workplace Hazardous Materials Information System (Canada).

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DNEL Derived No-Effect Level (REACH).

**Summary of Phrases****Hazard statements:**

H320 Causes eye irritation.

**Precautionary statements:**

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+352 IF ON SKIN: Wash with soap and water.

P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

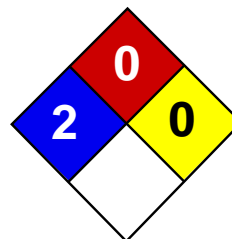
P403+233 Store in a well ventilated place. Keep container tightly closed.

P501 Dispose of contents and container as instructed in Section 13.

**Manufacturer Statement:**

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**NFPA:** 1-0-0**HMIS:** 1-0-0**Effective date:** 07.21.2015**Last updated:** 08.04.2015



Health	2
Fire	0
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet Bentonite MSDS

### Section 1: Chemical Product and Company Identification

**Product Name:** Bentonite

**Catalog Codes:** SLB1441, SLB2935, SLB4435

**CAS#:** 1302-78-9

**RTECS:** CT9450000

**TSCA:** TSCA 8(b) inventory: Bentonite

**CI#:** Not applicable.

**Synonym:** Montmorillonite;

**Chemical Name:** Not available.

**Chemical Formula:**  
(Al,Fe1.67Mg.33)Si10(OH)2Na(+)Ca(++)/2.33

**Contact Information:**

**Sciencelab.com, Inc.**  
14025 Smith Rd.  
Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**  
1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Bentonite	1302-78-9	100

**Toxicological Data on Ingredients:** Bentonite LD50: Not available. LC50: Not available.

### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant), of ingestion.

**Potential Chronic Health Effects:**

Hazardous in case of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs. Repeated or prolonged exposure to the substance can produce target organs damage.

### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.

**Skin Contact:** Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Not available.

### Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

### Section 7: Handling and Storage

**Precautions:**

Do not breathe dust. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area.

### Section 8: Exposure Controls/Personal Protection



**Engineering Controls:**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:**

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:**

TWA: 10 from ACGIH (TLV) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid.

**Odor:** Odorless.

**Taste:** Not available.

**Molecular Weight:** Not available.

**Color:** Beige. (Light.)

**pH (1% soln/water):** Not available.

**Boiling Point:** Not available.

**Melting Point:** Decomposes.

**Critical Temperature:** Not available.

**Specific Gravity:** 2.5 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** Not available.

**Solubility:**

Very slightly soluble in cold water, hot water. Insoluble in methanol, diethyl ether, n-octanol, acetone.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Not available.

**Incompatibility with various substances:** Not available.

**Corrosivity:** Not available.

**Special Remarks on Reactivity:** Not available.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

### Section 11: Toxicological Information

**Routes of Entry:** Eye contact. Inhalation.

**Toxicity to Animals:**

LD50: Not available. LC50: Not available.

**Chronic Effects on Humans:** Causes damage to the following organs: lungs.

**Other Toxic Effects on Humans:**

Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant), of ingestion.

**Special Remarks on Toxicity to Animals:** Not available.

**Special Remarks on Chronic Effects on Humans:** Not available.

**Special Remarks on other Toxic Effects on Humans:** Not available.

### Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are as toxic as the original product.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

### Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

### Section 15: Other Regulatory Information

**Federal and State Regulations:** TSCA 8(b) inventory: Bentonite

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:**

**WHMIS (Canada):** CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

**DSCL (EEC):** R36- Irritating to eyes.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

## Section 16: Other Information

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/10/2005 08:14 PM

**Last Updated:** 05/21/2013 12:00 PM

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# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**  
US GHS

**Synonyms:** Ultra Low Sulfur Diesel; Low Sulfur Diesel; No. 2 Diesel; Motor Vehicle Diesel Fuel; Non-Road Diesel Fuel; Locomotive/Marine Diesel Fuel

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquids - Category 3  
Skin Corrosion/Irritation – Category 2  
Germ Cell Mutagenicity – Category 2  
Carcinogenicity - Category 2  
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)  
Aspiration Hazard – Category 1  
Hazardous to the Aquatic Environment, Acute Hazard – Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Flammable liquid and vapor.  
Causes skin irritation.  
Suspected of causing genetic defects.  
Suspected of causing cancer.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

#### Precautionary Statements

##### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.

# Safety Data Sheet

**Material Name: Diesel Fuel, All Types**

**SDS No. 9909**

Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Avoid breathing fume/mist/vapours/spray.

## Response

In case of fire: Use water spray, fog or foam to extinguish.  
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.  
If swallowed: Immediately call a poison center or doctor. Do NOT induce vomiting.  
IF exposed or concerned: Get medical advice/attention.

## Storage

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

## Disposal

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

## \* \* \* Section 3 - Composition / Information on Ingredients \* \* \*

CAS #	Component	Percent
68476-34-6	Fuels, diesel, no. 2	100
91-20-3	Naphthalene	<0.1

A complex mixture of hydrocarbons with carbon numbers in the range C9 and higher.

## \* \* \* Section 4 - First Aid Measures \* \* \*

### First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

### First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## \* \* \* Section 5 - Fire Fighting Measures \* \* \*

### General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

### Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, and other gaseous agents.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

### Unsuitable Extinguishing Media

None

### Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

## \* \* \* Section 6 - Accidental Release Measures \* \* \*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

### Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

## Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

## Prevention of Secondary Hazards

None

## \* \* \* Section 7 - Handling and Storage \* \* \*

### Handling Procedures

Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame! No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

### Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks."

### Incompatibilities

Keep away from strong oxidizers.

## \* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \*

### Component Exposure Limits

#### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: 100 mg/m<sup>3</sup> TWA (inhalable fraction and vapor, as total hydrocarbons, listed under Diesel fuel)  
Skin - potential significant contribution to overall exposure by the cutaneous route (listed under Diesel fuel)

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Naphthalene (91-20-3)

ACGIH: 10 ppm TWA  
15 ppm STEL  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
NIOSH: 10 ppm TWA; 50 mg/m<sup>3</sup> TWA  
15 ppm STEL; 75 mg/m<sup>3</sup> STEL

## Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

## Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

## Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

## \* \* \* Section 9 - Physical & Chemical Properties \* \* \*

<b>Appearance:</b>	Clear, straw-yellow.	<b>Odor:</b>	Mild, petroleum distillate odor
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	0.009 psia @ 70 °F (21 °C)	<b>Vapor Density:</b>	>1.0
<b>Boiling Point:</b>	320 to 690 °F (160 to 366 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H<sub>2</sub>O):</b>	Negligible	<b>Specific Gravity:</b>	0.83-0.876 @ 60°F (16°C)
<b>Evaporation Rate:</b>	Slow; varies with conditions	<b>VOC:</b>	ND
<b>Percent Volatile:</b>	100%	<b>Octanol/H<sub>2</sub>O Coeff.:</b>	ND
<b>Flash Point:</b>	>125 °F (>52 °C) minimum	<b>Flash Point Method:</b>	PMCC
<b>Upper Flammability Limit (UFL):</b>	7.5	<b>Lower Flammability Limit (LFL):</b>	0.6
<b>Burning Rate:</b>	ND	<b>Auto Ignition:</b>	494°F (257°C)

## \* \* \* Section 10 - Chemical Stability & Reactivity Information \* \* \*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.



# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

## Incompatible Products

Keep away from strong oxidizers.

## Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

## \* \* \* Section 11 - Toxicological Information \* \* \*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

#### B: Component Analysis - LD50/LC50

##### Naphthalene (91-20-3)

Inhalation LC50 Rat >340 mg/m<sup>3</sup> 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

### Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

### Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause mild irritation.

### Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

### Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

### Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

### Generative Cell Mutagenicity

This material has been positive in a mutagenicity study.

### Carcinogenicity

#### A: General Product Information

Suspected of causing cancer.

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

## B: Component Carcinogenicity

### Fuels, diesel, no. 2 (68476-34-6)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Diesel fuel)

### Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)

IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

## Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

## Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

## Specified Target Organ General Toxicity: Repeated Exposure

This product is not reported to have any specific target organ general toxicity repeat exposure effects.

## Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

## \* \* \* Section 12 - Ecological Information \* \* \*

## Ecotoxicity

### A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

#### Fuels, diesel, no. 2 (68476-34-6)

##### Test & Species

96 Hr LC50 Pimephales promelas 35 mg/L [flow-through]

##### Conditions

#### Naphthalene (91-20-3)

##### Test & Species

96 Hr LC50 Pimephales promelas 5.74-6.44 mg/L [flow-through]

96 Hr LC50 Oncorhynchus mykiss 1.6 mg/L [flow-through]

96 Hr LC50 Oncorhynchus mykiss 0.91-2.82 mg/L [static]

96 Hr LC50 Pimephales promelas 1.99 mg/L [static]

##### Conditions

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

## Persistence/Degradability

No information available.

## Bioaccumulation

No information available.

## Mobility in Soil

No information available.

### \*\*\* Section 13 - Disposal Considerations \*\*\*

## Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

## Disposal of Contaminated Containers or Packaging

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

### \*\*\* Section 14 - Transportation Information \*\*\*

## DOT Information

Shipping Name: Diesel Fuel

NA #: 1993 Hazard Class: 3 Packing Group: III

Placard:



### \*\*\* Section 15 - Regulatory Information \*\*\*

## Regulatory Information

### Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

#### Naphthalene (91-20-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

#### SARA Section 311/312 – Hazard Classes

<u>Acute Health</u>	<u>Chronic Health</u>	<u>Fire</u>	<u>Sudden Release of Pressure</u>	<u>Reactive</u>
X	X	X	--	--

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## SARA SECTION 313 - SUPPLIER NOTIFICATION

This product may contain listed chemicals below the de minimis levels which therefore are not subject to the supplier notification requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372. If you may be required to report releases of chemicals listed in 40 CFR 372.28, you may contact Hess Corporate Safety if you require additional information regarding this product.

## State Regulations

### Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Fuels, diesel, no. 2	68476-34-6	No	No	No	Yes	No	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

### Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

### Additional Regulatory Information

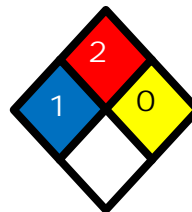
### Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Fuels, diesel, no. 2	68476-34-6	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS

## \*\*\* Section 16 - Other Information \*\*\*

**NFPA® Hazard Rating**

Health	1
Fire	2
Reactivity	0



**HMIS® Hazard Rating**

Health	1*	Slight
Fire	2	Moderate
Physical	0	Minimal

\*Chronic

# Safety Data Sheet

Material Name: Diesel Fuel, All Types

SDS No. 9909

## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

## Literature References

None

## Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet



# Safety Data Sheet

**Material Name: Gasoline All Grades**

**SDS No. 9950**  
US GHS

**Synonyms:** Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

## \*\*\* Section 1 - Product and Company Identification \*\*\*

### Manufacturer Information

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS  
Emergency # 800-424-9300 CHEMTREC  
[www.hess.com](http://www.hess.com) (Environment, Health, Safety Internet Website)

## \*\*\* Section 2 - Hazards Identification \*\*\*

### GHS Classification:

Flammable Liquid - Category 2  
Skin Corrosion/Irritation - Category 2  
Germ Cell Mutagenicity - Category 1B  
Carcinogenicity - Category 1B  
Toxic to Reproduction - Category 1A  
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)  
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)  
Aspiration Hazard - Category 1  
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

### GHS LABEL ELEMENTS

#### Symbol(s)



#### Signal Word

DANGER

#### Hazard Statements

Highly flammable liquid and vapour.  
Causes skin irritation.  
May cause genetic defects.  
May cause cancer.  
May damage fertility or the unborn child.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.  
May be fatal if swallowed and enters airways.  
Harmful to aquatic life.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Precautionary Statements

### Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking  
Keep container tightly closed.  
Ground/bond container and receiving equipment.  
Use explosion-proof electrical/ventilating/lighting/equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Wash hands and forearms thoroughly after handling.  
Obtain special instructions before use.  
Do not handle until all safety precautions have been read and understood.  
Do not breathe mist/vapours/spray.  
Use only outdoors or in well-ventilated area.  
Do not eat, drink or smoke when using this product.  
Avoid release to the environment.

### Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.  
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.  
IF exposed or concerned: Get medical advice/attention.  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.  
Get medical advice/attention if you feel unwell.  
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

### Storage

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

### Disposal

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

## \* \* \* Section 3 - Composition / Information on Ingredients \* \* \*

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

110-54-3	Hexane	0.5-4
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A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

## \* \* \* Section 4 - First Aid Measures \* \* \*

### First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

### First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

### First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## \* \* \* Section 5 - Fire Fighting Measures \* \* \*

### General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

### Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or gaseous extinguishing agent.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

### Unsuitable Extinguishing Media

None



# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

## \* \* \* Section 6 - Accidental Release Measures \* \* \*

### Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

### Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

### Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

### Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

### Prevention of Secondary Hazards

None

## \* \* \* Section 7 - Handling and Storage \* \* \*

### Handling Procedures

USE ONLY AS A MOTOR FUEL.  
DO NOT SIPHON BY MOUTH

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

## Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

## Incompatibilities

Keep away from strong oxidizers.

## \* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \*

### Component Exposure Limits

#### Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA  
500 ppm STEL

#### Toluene (108-88-3)

ACGIH: 20 ppm TWA  
OSHA: 200 ppm TWA; 375 mg/m<sup>3</sup> TWA  
150 ppm STEL; 560 mg/m<sup>3</sup> STEL  
NIOSH: 100 ppm TWA; 375 mg/m<sup>3</sup> TWA  
150 ppm STEL; 560 mg/m<sup>3</sup> STEL

#### Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)  
OSHA: 800 ppm TWA; 1900 mg/m<sup>3</sup> TWA  
NIOSH: 800 ppm TWA; 1900 mg/m<sup>3</sup> TWA

#### Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA  
150 ppm STEL  
OSHA: 100 ppm TWA; 435 mg/m<sup>3</sup> TWA  
150 ppm STEL; 655 mg/m<sup>3</sup> STEL

#### Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m<sup>3</sup> TWA

#### Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL  
OSHA: 1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA  
NIOSH: 1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Ethylbenzene (100-41-4)

ACGIH: 20 ppm TWA  
OSHA: 100 ppm TWA; 435 mg/m<sup>3</sup> TWA  
125 ppm STEL; 545 mg/m<sup>3</sup> STEL  
NIOSH: 100 ppm TWA; 435 mg/m<sup>3</sup> TWA  
125 ppm STEL; 545 mg/m<sup>3</sup> STEL

## Benzene (71-43-2)

ACGIH: 0.5 ppm TWA  
2.5 ppm STEL  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA  
NIOSH: 0.1 ppm TWA  
1 ppm STEL

## Hexane (110-54-3)

ACGIH: 50 ppm TWA  
Skin - potential significant contribution to overall exposure by the cutaneous route  
OSHA: 500 ppm TWA; 1800 mg/m<sup>3</sup> TWA  
NIOSH: 50 ppm TWA; 180 mg/m<sup>3</sup> TWA

## Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

## Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

## Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

## PERSONAL PROTECTIVE EQUIPMENT

### Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

### Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## \*\*\* Section 9 - Physical & Chemical Properties \*\*\*

<b>Appearance:</b>	Translucent, straw-colored or light yellow	<b>Odor:</b>	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
<b>Physical State:</b>	Liquid	<b>pH:</b>	ND
<b>Vapor Pressure:</b>	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	<b>Vapor Density:</b>	AP 3-4
<b>Boiling Point:</b>	85-437 °F (39-200 °C)	<b>Melting Point:</b>	ND
<b>Solubility (H2O):</b>	Negligible to Slight	<b>Specific Gravity:</b>	0.70-0.78
<b>Evaporation Rate:</b>	10-11	<b>VOC:</b>	ND
<b>Percent Volatile:</b>	100%	<b>Octanol/H2O Coeff.:</b>	ND
<b>Flash Point:</b>	-45 °F (-43 °C)	<b>Flash Point Method:</b>	PMCC
<b>Upper Flammability Limit (UFL):</b>	7.6%	<b>Lower Flammability Limit (LFL):</b>	1.4%
<b>Burning Rate:</b>	ND	<b>Auto Ignition:</b>	>530°F (>280°C)

## \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

### Chemical Stability

This is a stable material.

### Hazardous Reaction Potential

Will not occur.

### Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

### Incompatible Products

Keep away from strong oxidizers.

### Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

## \*\*\* Section 11 - Toxicological Information \*\*\*

### Acute Toxicity

#### A: General Product Information

Harmful if swallowed.

#### B: Component Analysis - LD50/LC50

##### Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

##### Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

##### Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

# Safety Data Sheet

**Material Name: Gasoline All Grades**

**SDS No. 9950**

**Xylenes (o-, m-, p- isomers) (1330-20-7)**

Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

**Benzene, 1,2,4-trimethyl- (95-63-6)**

Inhalation LC50 Rat 18 g/m<sup>3</sup> 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

**Ethyl alcohol (64-17-5)**

Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

**Ethylbenzene (100-41-4)**

Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

**Benzene (71-43-2)**

Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

**Hexane (110-54-3)**

Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

## Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

## Potential Health Effects: Eye Critical Damage/ Stimulativeness

Moderate irritant. Contact with liquid or vapor may cause irritation.

## Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

## Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

## Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

## Generative Cell Mutagenicity

This product may cause genetic defects.

## Carcinogenicity

### A: General Product Information

May cause cancer.

# Safety Data Sheet

**Material Name: Gasoline All Grades**

**SDS No. 9950**

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

## **B: Component Carcinogenicity**

### **Gasoline, motor fuel (86290-81-5)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

### **Toluene (108-88-3)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

### **Xylenes (o-, m-, p- isomers) (1330-20-7)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

### **Ethyl alcohol (64-17-5)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

### **Ethylbenzene (100-41-4)**

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

### **Benzene (71-43-2)**

ACGIH: A1 - Confirmed Human Carcinogen

OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA

NIOSH: potential occupational carcinogen

NTP: Known Human Carcinogen (Select Carcinogen)

IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

## **Reproductive Toxicity**

This product is suspected of damaging fertility or the unborn child.

## **Specified Target Organ General Toxicity: Single Exposure**

This product may cause drowsiness or dizziness.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

## Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

## \* \* \* Section 12 - Ecological Information \* \* \*

### Ecotoxicity

#### A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

#### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

##### Gasoline, motor fuel (86290-81-5)

Test & Species	Conditions
96 Hr LC50 Alburnus alburnus	119 mg/L [static]
96 Hr LC50 Cyprinodon variegatus	82 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	56 mg/L
24 Hr EC50 Daphnia magna	170 mg/L

##### Toluene (108-88-3)

Test & Species	Conditions	
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L [semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

##### Xylenes (o-, m-, p- isomers) (1330-20-7)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through]

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi- static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

## Benzene, 1,2,4-trimethyl- (95-63-6)

### Test & Species

96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

### Conditions

## Ethyl alcohol (64-17-5)

### Test & Species

96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

### Conditions

## Ethylbenzene (100-41-4)

### Test & Species

96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi- static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow- through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

### Conditions



# Safety Data Sheet

**Material Name: Gasoline All Grades**

**SDS No. 9950**

96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

## **Benzene (71-43-2)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

## **Hexane (110-54-3)**

### **Test & Species**

### **Conditions**

96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

## **Persistence/Degradability**

No information available.

## **Bioaccumulation**

No information available.

## **Mobility in Soil**

No information available.

<b>*** Section 13 - Disposal Considerations ***</b>
---

## **Waste Disposal Instructions**

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

## **Disposal of Contaminated Containers or Packaging**

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

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## \*\*\* Section 14 - Transportation Information \*\*\*

### Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

### DOT Information

Shipping Name: Gasoline

UN #: 1203 Hazard Class: 3 Packing Group: II

Placard:



## \*\*\* Section 15 - Regulatory Information \*\*\*

### Regulatory Information

#### A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

##### **Toluene (108-88-3)**

SARA 313: 1.0 % de minimis concentration  
CERCLA: 1000 lb final RQ; 454 kg final RQ

##### **Xylenes (o-, m-, p- isomers) (1330-20-7)**

SARA 313: 1.0 % de minimis concentration  
CERCLA: 100 lb final RQ; 45.4 kg final RQ

##### **Benzene, 1,2,4-trimethyl- (95-63-6)**

SARA 313: 1.0 % de minimis concentration

##### **Ethylbenzene (100-41-4)**

SARA 313: 0.1 % de minimis concentration  
CERCLA: 1000 lb final RQ; 454 kg final RQ

##### **Benzene (71-43-2)**

SARA 313: 0.1 % de minimis concentration  
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration

CERCLA: 5000 lb final RQ; 2270 kg final RQ

## SARA Section 311/312 – Hazard Classes

Acute Health

X

Chronic Health

X

Fire

X

Sudden Release of Pressure

--

Reactive

--

## Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

## State Regulations

### Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

# Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950

## Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

## Additional Regulatory Information

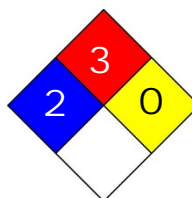
## Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

## \*\*\* Section 16 - Other Information \*\*\*

**NFPA® Hazard Rating**

Health	2
Fire	3
Reactivity	0



**HMIS® Hazard Rating**

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal

\*Chronic

## Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

## Literature References

None

# Safety Data Sheet

**Material Name: Gasoline All Grades**

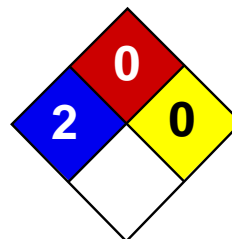
**SDS No. 9950**

## Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet



Health	3
Fire	0
Reactivity	0
Personal Protection	

## Material Safety Data Sheet

### Hydrochloric acid, 10% MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Hydrochloric acid, 10%

**Catalog Codes:** SLH1732

**CAS#:** Mixture.

**RTECS:** Not applicable.

**TSCA:** TSCA 8(b) inventory: Hydrochloric acid; Water

**CI#:** Not applicable.

**Synonym:** Hydrochloric Acid, 10% ((w/v), N.F

**Chemical Name:** Not applicable.

**Chemical Formula:** Not applicable.

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	2-3.8
Water	7732-18-5	96.2-98

**Toxicological Data on Ingredients:** Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Very hazardous in case of skin contact (irritant), of eye contact (irritant). Hazardous in case of ingestion. Slightly hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive), of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

**Potential Chronic Health Effects:**

Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS:** Classified 3 (Not classifiable for human.) by IARC [Hydrogen chloride]. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, , teeth. Repeated or prolonged exposure to the substance can produce target organs damage.

Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

#### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:** Non-explosive in presence of open flames and sparks, of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:**

Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammable gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrogen gas. (Hydrochloric Acid)

**Special Remarks on Explosion Hazards:**

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl<sub>4</sub> Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino

ethanol, Ammonium hydroxide, Calcium carbide Ca<sub>3</sub>P<sub>2</sub> Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO<sub>4</sub> Hexalithium disilicide H<sub>2</sub>SO<sub>4</sub> Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U<sub>3</sub>P<sub>4</sub>, Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

## Section 6: Accidental Release Measures

### Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

### Large Spill:

Corrosive liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## Section 7: Handling and Storage

### Precautions:

Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F).

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

### Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

Hydrogen chloride STEL: 7.5 (mg/m<sup>3</sup>) from ACGIH (TLV) [United States] STEL: 5 (ppm) from ACGIH (TLV) [United States] CEIL: 5 (ppm) from NIOSH CEIL: 7.5 (mg/m<sup>3</sup>) from NIOSH CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m<sup>3</sup>) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Liquid.

**Odor:** Disagreeable and choking. (Strong.)

**Taste:** Acid. (Strong.)



**Molecular Weight:** Not applicable.

**Color:** Clear Colorless.

**pH (1% soln/water):** Acidic.

**Boiling Point:** The lowest known value is 100°C (212°F) (Water).

**Melting Point:** Not available.

**Critical Temperature:** Not available.

**Specific Gravity:** 1.05 (Water = 1)

**Vapor Pressure:** The highest known value is 2.3 kPa (@ 20°C) (Water).

**Vapor Density:** The highest known value is 0.62 (Air = 1) (Water).

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, diethyl ether.

**Solubility:**

Easily soluble in cold water. Soluble in hot water, diethyl ether.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials

**Incompatibility with various substances:**

Reactive with alkalis. Slightly reactive to reactive with oxidizing agents, organic materials, metals.

**Corrosivity:**

Highly corrosive in presence of aluminum, of zinc, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Isolate hydrogen chloride from heat, direct, alkalies (reacts vigorously), organic materials(reacts vigorously with many organic materials), and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothermic reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the following can cause explosion or ignition on contact or other violent/vigorous reaction: Acetic anhydride, Alcohols + hydrogen cyanide, Aluminum, Aluminum phosphide, Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium, Ammonium hydroxide, 1,4-Benzoquinone diimine, Calcium acetylide (incandescence upon warming), Calcium carbide, Calcium phosphide, Carbon tetrachloride + silver perchlorate (produce trichloromethyl perchlorate), Cesium acetylene carbide, Cesium carbide, Cesium telluroacylates, Chlorine + dinitroanilines (evolves gas), Chloroacetaldehyde oxime, Chlorosulfonic acid, Cyanogen chloride (when catalyzed by HCl), 1,1-Difluoroethylene, Dinitroanilines, Ethylene, Ethylene diamine, Ethyl 2-formylpropionate oxime (when generated by using HCl as a catalyst), Ethylene imine, Fluorine, HClO<sub>4</sub>, Hexalithium disilicide, Hydrogen peroxide, Metal acetylides, carbides, Magnesium boride, Methyl vinyl ether, Mercuric sulfate, Nitric acid + glycerol, Oleum, Perchloric acid, Potassium, Potassium permanganate, beta-Propiolactone, Propylene oxide, Rubidium acetylide, Rubidium carbide, Rubidium acetylene carbide, Silicon dioxide, Silver chlorite, Sodium (with

a q u e o u s H C l ) , S o d i u m 2-allyloxy-6-nitrophenylpyruvate oxime, Sodium hydroxide, Sodium tetraselenium, Sulfonic acid, Sulfuric acid, Tetraselenium tetranitride, 2,4,6-Tri(2-acetylhydrazino)-1,3,5-trinitrobenzene, Uranium phosphide, Vinyl acetate. Hydrogen chloride gas can react with formaldehyde to form bis(chloromethyl)ether, a human carcinogen. Most metals, as well as certain coatings, plastics, and rubbers, are attacked by hydrogen chloride. Addition of hydrochloric acid to the following results in an exothermic reaction: Cesium cyanotridecahydrodecarborate(2-), Potassium ferricyanide, Vinylidene fluoride. Addition of hydrochloric acid to potassium ferrocyanide or ammonium hexacyanoferrate(II) results in an endothermic reaction. Hydrochloric acid in the presence of alcohol and glycols results in dehydration reactions.

**Special Remarks on Corrosivity:**

This compound is highly corrosive when in solution (especially to most metals except: gold, mercury, platinum, silver, and tantalum). The anhydrous gas is not corrosive . (Hydrogen chloride)

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

**Toxicity to Animals:**

Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat]. (Hydrochloric Acid)

**Chronic Effects on Humans:**

CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrogen chloride]. Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes, , teeth.

**Other Toxic Effects on Humans:**

Very hazardous in case of skin contact (irritant). Hazardous in case of ingestion. Slightly hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive), of inhalation (lung sensitizer, lung corrosive).

**Special Remarks on Toxicity to Animals:**

Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M (Hydrochloric Acid)

**Special Remarks on Chronic Effects on Humans:**

May cause adverse reproductive effects (fetotoxicity). May affect genetic material.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: Mildly Corrosive. Causes skin irritation and possible burns. Eyes: Mildly Corrosive. Causes eye irritation possible burns. Inhalation: May cause irritation of the nose, throat, bronchi (upper respiratory tract), coughing, sneezing, hoarseness. May affect the lungs/respiration. May affect the liver. Ingestion: Causes irritation gastrointestinal tract with nausea, vomiting abdominal cramps, and diarrhea. May affect behavior, the cardiovascular system, respiration and urinary system (kidneys). Chronic Potential Health Effects: Prolonged or repeated inhalation or ingestion may affect liver, respiration(changes in pulmonary function, chronic bronchitis), teeth (yellowing of teeth and erosion of tooth enamel), kidneys, and behavior. Prolonged or repeated skin contact may cause dermatitis.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**Section 14: Transport Information**

**DOT Classification:** Class 8: Corrosive material

**Identification:** : Hydrochloric acid, solution UNNA: 1789 PG: II

**Special Provisions for Transport:** Not available.

**Section 15: Other Regulatory Information****Federal and State Regulations:**

Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid; Water TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid 10% CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg);

**Other Regulations:** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

**Other Classifications:****WHMIS (Canada):**

CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

**DSCL (EEC):**

This product is not classified according to the EU regulations. Not applicable.

**HMIS (U.S.A.):**

**Health Hazard:** 3

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:**

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

**Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 05:45 PM

**Last Updated:** 05/21/2013 12:00 PM

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# SAFETY DATA SHEET

## 1. Identification

**Product identifier:** HYDROCHLORIC ACID

**Other means of identification**

**Synonyms:** Muriatic Acid, Hydrogen Chloride, Aqueous  
**Product No.:** 9385, 9538, 9165, V226, V187, V078, V001, 6900, 2624, 2515, H999, H987, H616, 5861, 2062, 5814, 2626, 2612, 5800, 9625, 5587, 9551, 9544, 9539, 9535, 9530, 9529, 5367, H613, 37825, 25496, 20620, H613

**Recommended use and restriction on use**

**Recommended use:** Not available.  
**Restrictions on use:** Not known.

**Manufacturer/Importer/Supplier/Distributor Information**

**Manufacturer**

Company Name: Avantor Performance Materials, Inc.  
 Address: 3477 Corporate Parkway, Suite 200  
 Center Valley, PA 18034  
 Telephone: Customer Service: 855-282-6867  
 Fax:  
 Contact Person: Environmental Health & Safety  
 e-mail: info@avantormaterials.com

**Emergency telephone number:**

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

## 2. Hazard(s) identification

**Hazard Classification**

**Physical Hazards**

Corrosive to metals Category 1

**Health Hazards**

Acute toxicity (Oral) Category 4  
 Skin Corrosion/Irritation Category 1  
 Serious Eye Damage/Eye Irritation Category 1  
 Specific Target Organ Toxicity -  
 Single Exposure (Inhalation - vapor) Category 3

**Label Elements**

**Hazard Symbol:**



**Signal Word:** Danger

<b>Hazard Statement:</b>	May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage. May cause respiratory irritation.
<b>Precautionary Statement</b>	
<b>Prevention:</b>	Keep only in original container. Wash thoroughly after handling. Do not breathe dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product.
<b>Response:</b>	Absorb spillage to prevent material damage. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. 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.
<b>Storage:</b>	Store locked up. Store in a well-ventilated place. Keep container tightly closed. Store in corrosive resistant container with a resistant inner liner.
<b>Disposal:</b>	Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.
<b>Other hazards which do not result in GHS classification:</b>	None.

### 3. Composition/information on ingredients

#### Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
HYDROCHLORIC ACID		7647-01-0	20 - 40%

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

### 4. First-aid measures

<b>General information:</b>	Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.
<b>Ingestion:</b>	Call a physician or poison control center immediately. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
<b>Inhalation:</b>	Move to fresh air. Call a physician or poison control center immediately. Apply artificial respiration if victim is not breathing. If breathing is difficult, give oxygen.
<b>Skin Contact:</b>	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

**Eye contact:** Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.

**Most important symptoms/effects, acute and delayed**

**Symptoms:** Causes severe skin and eye burns. Harmful if swallowed.

**Indication of immediate medical attention and special treatment needed**

**Treatment:** Treat symptomatically. Symptoms may be delayed.

**5. Fire-fighting measures**

**General Fire Hazards:** No data available.

**Suitable (and unsuitable) extinguishing media**

**Suitable extinguishing media:** The product is non-combustible. Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media:** None known.

**Specific hazards arising from the chemical:** Fire or excessive heat may produce hazardous decomposition products.

**Special protective equipment and precautions for firefighters**

**Special fire fighting procedures:** Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters:** Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

**6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:** Ventilate closed spaces before entering them. Keep unauthorized personnel away. Evacuate area. Keep upwind. See Section 8 of the SDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

**Methods and material for containment and cleaning up:** Neutralize with lime or soda ash. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Dike far ahead of larger spill for later recovery and disposal.

**Notification Procedures:** Inform authorities if large amounts are involved.

**Environmental Precautions:** Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

**7. Handling and storage**

**Precautions for safe handling:** Do not eat, drink or smoke when using the product. Do not get in eyes, on skin, on clothing. Wash hands thoroughly after handling. Do not breathe dust/fume/gas/mist/vapors/spray. Use caution when adding this material to water.

**Conditions for safe storage, including any incompatibilities:**

Keep container tightly closed. Store in a well-ventilated place. Unsuitable containers: metals.

## 8. Exposure controls/personal protection

### Control Parameters

#### Occupational Exposure Limits

Chemical Identity	Type	Exposure Limit Values	Source
HYDROCHLORIC ACID	Ceiling	2 ppm	US. ACGIH Threshold Limit Values (2011)
	Ceil_Time	5 ppm 7 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	Ceiling	5 ppm 7 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceiling	5 ppm 7 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

**Appropriate Engineering Controls**

No data available.

### Individual protection measures, such as personal protective equipment

**General information:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area.

**Eye/face protection:** Wear safety glasses with side shields (or goggles) and a face shield.

#### Skin Protection

**Hand Protection:** Chemical resistant gloves

**Other:** Wear suitable protective clothing and gloves.

**Respiratory Protection:** If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

**Hygiene measures:** Provide eyewash station and safety shower. Observe good industrial hygiene practices. Wash hands before breaks and immediately after handling the product. Do not get in eyes. Wash contaminated clothing before reuse. Do not get this material in contact with skin.

## 9. Physical and chemical properties

### Appearance

**Physical state:** Liquid

**Form:** Liquid

**Color:** Colorless

**Odor:** Pungent

**Odor threshold:** No data available.

**pH:** 0.1 (1 N aqueous solution)

**Melting point/freezing point:** -35 °C



<b>Initial boiling point and boiling range:</b>	48 °C
<b>Flash Point:</b>	Not applicable
<b>Evaporation rate:</b>	No data available.
<b>Flammability (solid, gas):</b>	No data available.
<b>Upper/lower limit on flammability or explosive limits</b>	
<b>Flammability limit - upper (%):</b>	No data available.
<b>Flammability limit - lower (%):</b>	No data available.
<b>Explosive limit - upper (%):</b>	No data available.
<b>Explosive limit - lower (%):</b>	No data available.
<b>Vapor pressure:</b>	14.1 kPa
<b>Vapor density:</b>	No data available.
<b>Relative density:</b>	1.18 (20 °C)
<b>Solubility(ies)</b>	
<b>Solubility in water:</b>	Soluble
<b>Solubility (other):</b>	No data available.
<b>Partition coefficient (n-octanol/water):</b>	No data available.
<b>Auto-ignition temperature:</b>	No data available.
<b>Decomposition temperature:</b>	No data available.
<b>Viscosity:</b>	No data available.

## 10. Stability and reactivity

<b>Reactivity:</b>	Reacts violently with strong alkaline substances.
<b>Chemical Stability:</b>	Material is stable under normal conditions.
<b>Possibility of Hazardous Reactions:</b>	Hazardous polymerization does not occur.
<b>Conditions to Avoid:</b>	Avoid contact with strong reducing agents. Strong oxidizing agents. Contact with alkalis.
<b>Incompatible Materials:</b>	Acids. Amines. Alkalies. Metals. Reducing agents. Oxidizing agents.
<b>Hazardous Decomposition Products:</b>	Chlorine. hydrogen chloride By heating and fire, corrosive vapors/gases may be formed.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Ingestion:</b>	Harmful if swallowed.
<b>Inhalation:</b>	Causes severe burns.
<b>Skin Contact:</b>	Causes severe skin burns.
<b>Eye contact:</b>	Causes serious eye damage.

### Information on toxicological effects

#### Acute toxicity (list all possible routes of exposure)

<b>Oral</b>	
<b>Product:</b>	ATEmix (Rat): 581 mg/kg
<b>Dermal</b>	
<b>Product:</b>	No data available.

#### Specified substance(s):

HYDROCHLORIC ACID LD 50 (Mouse): 1,449 mg/kg

**Inhalation**

**Product:** No data available.

**Specified substance(s):**

HYDROCHLORIC ACID LC 50 (Mouse, 1 h): 1108 ppm  
LC 50 (Rat, 1 h): 3124 ppm

**Repeated Dose Toxicity**

**Product:** No data available.

**Skin Corrosion/Irritation**

**Product:** Causes severe skin burns.

**Serious Eye Damage/Eye Irritation**

**Product:** Causes serious eye damage.

**Respiratory or Skin Sensitization**

**Product:** Not a skin sensitizer.

**Carcinogenicity**

**Product:** This substance has no evidence of carcinogenic properties.

**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**

No carcinogenic components identified

**US. National Toxicology Program (NTP) Report on Carcinogens:**

No carcinogenic components identified

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):**

No carcinogenic components identified

**Germ Cell Mutagenicity**

**In vitro**

**Product:** No mutagenic components identified

**In vivo**

**Product:** No mutagenic components identified

**Reproductive Toxicity**

**Product:** No components toxic to reproduction

**Specific Target Organ Toxicity - Single Exposure**

**Product:** Respiratory tract irritation.

**Specific Target Organ Toxicity - Repeated Exposure**

**Product:** None known.

**Aspiration Hazard**

**Product:** Not classified

**Other Effects:** None known.

**12. Ecological information**

**Ecotoxicity:**

**Acute hazards to the aquatic environment:**

**Fish**

**Product:** No data available.

**Specified substance(s):**

HYDROCHLORIC ACID LC 50 (Western mosquitofish (*Gambusia affinis*), 96 h): 282 mg/l Mortality

**Aquatic Invertebrates**

**Product:** No data available.

**Specified substance(s):**

HYDROCHLORIC ACID LC 50 (Green or European shore crab (*Carcinus maenas*), 48 h): 240 mg/l Mortality  
LC 50 (Common shrimp, sand shrimp (*Crangon crangon*), 48 h): 260 mg/l Mortality

**Chronic hazards to the aquatic environment:**

**Fish**

**Product:** No data available.

**Aquatic Invertebrates**

**Product:** No data available.

**Toxicity to Aquatic Plants**

**Product:** No data available.

**Persistence and Degradability**

**Biodegradation**

**Product:** Expected to be readily biodegradable.

**BOD/COD Ratio**

**Product:** No data available.

**Bioaccumulative Potential**

**Bioconcentration Factor (BCF)**

**Product:** No data available on bioaccumulation.

**Partition Coefficient n-octanol / water (log Kow)**

**Product:** No data available.

**Mobility in Soil:**

The product is water soluble and may spread in water systems.

**Other Adverse Effects:**

Large amounts of the product may affect the acidity (pH-factor) in water with possible risk of harmful effects to aquatic organisms.

<p><b>13. Disposal considerations</b></p>
---

**Disposal instructions:**

Discharge, treatment, or disposal may be subject to national, state, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

**Contaminated Packaging:**

No data available.

**14. Transport information**

**DOT**

UN Number: UN 1789  
 UN Proper Shipping Name: Hydrochloric acid  
 Transport Hazard Class(es)  
   Class(es): 8  
   Label(s): 8  
 Packing Group: II  
 Marine Pollutant: No

**IMDG**

UN Number: UN 1789  
 UN Proper Shipping Name: HYDROCHLORIC ACID  
 Transport Hazard Class(es)  
   Class(es): 8  
   Label(s): 8  
   EmS No.: F-A, S-B  
 Packing Group: II  
 Marine Pollutant: No

**IATA**

UN Number: UN 1789  
 Proper Shipping Name: Hydrochloric acid  
 Transport Hazard Class(es):  
   Class(es): 8  
   Label(s): 8  
 Marine Pollutant: No  
 Packing Group: II

**15. Regulatory information**

**US Federal Regulations**

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**  
**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**  
 None present or none present in regulated quantities.

**CERCLA Hazardous Substance List (40 CFR 302.4):**  
 HYDROCHLORIC ACID            Reportable quantity: 5000 lbs.

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**

Acute (Immediate)     Chronic (Delayed)     Fire     Reactive     Pressure Generating

**SARA 302 Extremely Hazardous Substance**

Chemical Identity	RQ	Threshold Planning Quantity
HYDROCHLORIC ACID	5000 lbs.	500 lbs.

**SARA 304 Emergency Release Notification**

Chemical Identity	RQ
HYDROCHLORIC ACID	5000 lbs.

**SARA 311/312 Hazardous Chemical**

<b>Chemical Identity</b>	<b>Threshold Planning Quantity</b>
HYDROCHLORIC ACID	500lbs

**SARA 313 (TRI Reporting)**

<b>Chemical Identity</b>	<b>Reporting threshold for other users</b>	<b>Reporting threshold for manufacturing and processing</b>
HYDROCHLORIC ACID	10000 lbs	25000 lbs.

**Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**

HYDROCHLORIC ACID Reportable quantity: 5000 lbs.

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

HYDROCHLORIC ACID Threshold quantity: 15000 lbs

HYDROCHLORIC ACID Threshold quantity: 5000 lbs

**US State Regulations**

**US. California Proposition 65**

No ingredient regulated by CA Prop 65 present.

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

HYDROCHLORIC ACID Listed

**US. Massachusetts RTK - Substance List**

HYDROCHLORIC ACID Listed

**US. Pennsylvania RTK - Hazardous Substances**

HYDROCHLORIC ACID Listed

**US. Rhode Island RTK**

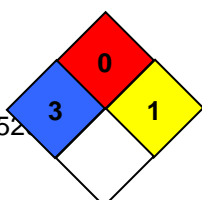
HYDROCHLORIC ACID Listed

**Inventory Status:**

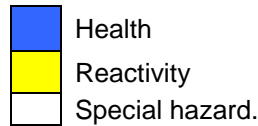
Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EU EINECS List:	On or in compliance with the inventory
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	On or in compliance with the inventory
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Switzerland Consolidated Inventory:	Not in compliance with the inventory.
Japan ISHL Listing:	Not in compliance with the inventory.
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

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

**NFPA Hazard ID**



Flammability



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

**Issue Date:** 02-02-2015

**Revision Date:** No data available.

**Version #:** 4.0

**Further Information:** No data available.

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**Safety Data Sheet**  
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

Revision: 05/12/2015

**LIQUINOX****1 Identification of the Substance/mixture and of the Company/Undertaking****1.1 Product identifier**Trade name: **LIQUINOX**

Application of the substance / the preparation: Hand detergent.

**1.2 Relevant identified uses of the substance or mixture and uses advised against:**

No additional information available.

**1.3 Details of the supplier of the Safety Data Sheet****Manufacturer/Supplier:**

Alconox, Inc.  
30 Glenn St., Suite 309  
White Plains, NY 10603  
Phone: 914-948-4040



Further information obtainable from: Product Safety Department.

**1.4 Emergency telephone number:**

ChemTel Inc.: (800)255-3924, +1 (813)248-0585

**2 Hazards Identification****2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008:**

Classification according to Directive 67/548/EEC or Directive 1999/45/EC:



GHS07

*Skin Irrit. 2, H315: Causes skin irritation.***Information concerning particular hazards for human and environment:**

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

**Classification system:**

The classification is according to the latest editions of the EU-lists, and extended by company and literature data

**2.2 Label elements****Labelling according to Regulation (EC) No 1272/2008:**

The product is classified and labelled according to the CLP regulation.

**Hazard pictograms:**

GHS07

**Signal word:** Warning**Hazard-determining components of labelling:**

Alkyl benzene sulfonic acid, sodium salt.

# Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
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## LIQUINOX

**Hazard statements:**

H315: Causes skin irritation.

**Precautionary statements:**

P332+P313: If skin irritation occurs: Get medical advice/attention.

P302+P352: IF ON SKIN: Wash with plenty of soap and water.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

**Other Hazard description:****WHMIS-classification and symbols:**

D2B - Toxic material causing other toxic effects

**NFPA ratings (scale 0 - 4)**

Health = 1

Fire = 0

Reactivity = 0

**HMIS-ratings (scale 0 - 4)**

HEALTH	1	
FIRE	0	
REACTIVITY	0	

Health = 1

Fire = 0

Reactivity = 0

**2.3 Other hazards****Results of PBT and vPvB assessment**

PBT: Not applicable.

vPvB: Not applicable.

**3 Composition/Information on Ingredients****3.2 Chemical characterization:** Mixture**Description:** Hazardous ingredients of mixture listed below.

Identifying Nos.	Description	Wt. %
CAS: 68081-81-2	Alkyl benzene sulfonic acid, sodium salt	10 - 25%
CAS: 1300-72-7 EINECS: 215-090-9	Sodium xylene sulphonate	2.5 - 10%
CAS: 84133-50-6	Alcohol Ethoxylate	2.5 - 10%
CAS: 68603-42-9 EINECS: 271-657-0	Coconut diethanolamide	2.5 - 10%
CAS: 17572-97-3 EINECS: 241-543-5	Ethylenediaminetetraacetic acid, tripotassium salt	2.5 - 10%

**Additional information:** For the wording of the listed risk phrases refer to section 16.



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**LIQUINOX****4 First Aid Measures****4.1 Description of first aid measures****General information:**

Take affected persons out into the fresh air.

**After inhalation:**

Supply fresh air; consult doctor in case of complaints.

**After skin contact:**

Immediately wash with water and soap and rinse thoroughly for 30 minutes. If skin irritation continues, consult a doctor.

**After eye contact:**

Remove contact lenses if worn.

Rinse opened eye for at least 30 minutes under running water, lifting upper and lower lids occasionally. Immediately consult a doctor.

**After swallowing:**

Do not induce vomiting; call for medical help immediately. Rinse out mouth and then drink plenty of water.

A person vomiting while laying on their back should be turned onto their side.

**4.2 Most important symptoms and effects, both acute and delayed:**

Irritating, all routes of exposure.

**4.3 Indication of any immediate medical attention and special treatment needed:**

No additional information available.

**5 Firefighting Measures****5.1 Extinguishing media:****Suitable extinguishing agents:**

CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**5.2 Special hazards arising from the substance or mixture:**

No additional information available.

**5.3 Advice for firefighters:****Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

**6 Accidental Release Measures****6.1 Personal precautions, protective equipment and emergency procedures:**

Ensure adequate ventilation.

Particular danger of slipping on leaked/spilled product.

**6.2 Environmental precautions:**

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

**6.3 Methods and material for containment and cleaning up:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Clean the affected area carefully; suitable cleaners are: Warm water

Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

**6.4 Reference to other sections:**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information

**7 Handling and Storage****7.1 Precautions for safe handling:**

No special precautions are necessary if used correctly.

**Information about fire - and explosion protection:**

No special measures required.

# Safety Data Sheet

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GHS

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## LIQUINOX

### 7.2 Conditions for safe storage, including any incompatibilities:

#### Storage:

**Requirements to be met by storerooms and receptacles:** No special requirements.

**Information about storage in one common storage facility:** No special requirements.

**Further information about storage conditions:** None

### 7.3 Specific end use(s): No additional information available.

## 8 Exposure Controls/Personal Protection

### 8.1 Control parameters

#### Ingredients with limit values that require monitoring at the workplace:

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

**Additional information:** The lists valid during the making were used as basis.

### 8.2 Exposure controls:

#### Personal protective equipment:

##### General protective and hygienic measures:

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

##### Respiratory protection:

Not required under normal conditions of use.

##### Protection of hands:



Protective gloves

The glove material has to be impermeable and resistant to the product. Selection of the glove material should be based on the penetration time, rates of diffusion and the degradation of the glove material.

##### Material of gloves:

The selection of a suitable gloves does not only depend on the material, but also on the quality, and varies from manufacturer to manufacturer.

##### Penetration time of glove material:

The exact break through time has to be determined by the manufacturer of the protective gloves. DO NOT exceed the breakthrough time set by the Manufacturer.

##### For long term contact, gloves made of the following materials are considered suitable:

Butyl rubber, BR

Nitrile rubber, NBR

Natural rubber (NR)

Neoprene gloves

##### Eye protection:



Safety glasses

Goggles recommended during refilling.

**Body protection:** Protective work clothing

# Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

Revision: 05/12/2015

## LIQUINOX

### 9 Physical and Chemical Properties

#### 9.1 Information on basic physical and chemical properties:

##### General Information:

##### Appearance:

Form:	Liquid
Color:	Light Yellow
Odor:	Odorless
Odor threshold:	Not determined.
pH-value:	8.5

##### Change in condition:

Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	100°C

Flash point: Not applicable.

Flammability (solid, gaseous): Not applicable.

Ignition temperature: Not applicable.

Decomposition temperature: Not determined.

Self-igniting: Product is not selfigniting.

Danger of explosion: Product does not present an explosion hazard.

##### Explosion limits:

Lower:	Not determined.
Upper:	Not determined.

Vapor pressure at 20°C: 23 hPa

Density: 1.08 g/cm<sup>3</sup>

Relative density: Not determined.

Vapor density: Not determined.

Evaporation rate: Not determined.

Solubility in / Miscibility with water: Fully miscible.

Segregation coefficient (n-octanol/water): Not determined.

##### Viscosity:

Dynamic:	Not determined.
Kinematic:	Not determined.

##### Solvent content:

Organic solvents:	Not determined.
Solids content:	Not determined.

9.2 Other information: No additional information available.

### 10 Stability and Reactivity

#### 10.1 Reactivity:

#### 10.2 Chemical stability:

##### Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

#### 10.3 Possibility of hazardous reactions:

Reacts with strong oxidizing agents. Reacts with strong acids.

#### 10.4 Conditions to avoid:

No additional information available.

#### 10.5 Incompatible materials:

No additional information available.

# Safety Data Sheet

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GHS

Effective date: 05/12/2015

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## LIQUINOX

**10.6 Hazardous decomposition products:**

Carbon monoxide and carbon dioxide  
Sulphur oxides (SO<sub>x</sub>)  
Nitrogen oxides

## 11 Toxicological Information

**11.1 Information on toxicological effects:****Toxicity data:** Toxicity data is available for mixture:**Primary irritant effect:****On the skin:** Irritating to skin and mucous membranes.**On the eye:** Strong irritant with the danger of severe eye injury.**Sensitization:** No sensitizing effects known.**Additional toxicological information:**

The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version: Irritant

## 12 Ecological Information

**12.1 Toxicity:****Aquatic toxicity:** No additional information available.**12.2 Persistence and degradability:** Biodegradable.**12.3 Bioaccumulative potential:** Does not accumulate in organisms.**12.4 Mobility in soil:** No additional information available.**Additional ecological information:****General notes:**

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Must not reach sewage water or drainage ditch undiluted or un-neutralized.

**12.5 Results of PBT and vPvB assessment:****PBT:** Not applicable.**vPvB:** Not applicable.**12.6 Other adverse effects:** No additional information available.

## 13 Disposal Considerations

**13.1 Waste treatment methods:****Recommendation:**

Smaller quantities can be disposed of with household waste.

Small amounts may be diluted with plenty of water and washed away. Dispose of bigger amounts in accordance with Local Authority requirements.

The surfactant used in this product complies with the biodegradability criteria as laid down in Regulation (EC) No. 648/2004 on detergents. Data to support this assertion are held at the disposal of the competent authorities of the Member States and will be made available to them, at their direct request or at the request of a detergent manufacturer.

**Uncleaned packaging:****Recommendation:** Disposal must be made according to official regulations.**Recommended cleansing agents:** Water, together with cleansing agents, if necessary.

## 14 Transport Information

**14.1 UN-Number:**

DOT, ADR, ADN, IMDG, IATA:

Not Regulated

**14.2 UN proper shipping name:**

DOT, ADR, IMDG, IATA:

Not Regulated

**Safety Data Sheet**  
 according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
 GHS

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**LIQUINOX**
**14.3 Transport hazard class(es):**

DOT, ADR, IMDG, IATA:

Class:	Not Regulated
Label:	-

**14.4 Packing group:**

DOT, ADR, IMDG, IATA: Not Regulated

**14.5 Environmental hazards:**

Marine pollutant: No

**14.6 Special precautions for user:**

Not applicable.

**14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.

UN "Model Regulation": Not Regulated

**15 Regulatory Information**
**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:****United States (USA):****SARA:****Section 355 (extremely hazardous substances):** None of the ingredient is listed.**Section 313 (Specific toxic chemical listings):** None of the ingredient is listed.**TSCA (Toxic Substances Control Act):** All ingredients are listed.**Proposition 65 (California):****Chemicals known to cause cancer:** None of the ingredient is listed.**Chemicals known to cause reproductive toxicity for females:** None of the ingredient is listed.**Chemicals known to cause reproductive toxicity for males:** None of the ingredient is listed.**Chemicals known to cause developmental toxicity:** None of the ingredient is listed.**Carcinogenic Categories:****EPA (Environmental Protection Agency):** None of the ingredient is listed.**TLV (Threshold Limit Value established by ACGIH):** None of the ingredient is listed.**NIOSH-Ca (National Institute for Occupational Safety and Health):** None of the ingredient is listed.**OSHA-Ca (Occupational Safety & Health Administration):** None of the ingredient is listed.**Canadá:****Canadian Domestic Substances List (DSL):** All ingredients are listed.**Canadian Ingredient Disclosure list (limit 0.1%):** None of the ingredient is listed.**Canadian Ingredient Disclosure list (limit 1%):** None of the ingredient is listed.**15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.
**16 Other Information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Relevant phrases:**

H315: Causes skin irritation.

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according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and  
GHS

Effective date: 05/12/2015

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**LIQUINOX****Abbreviations and Acronyms:**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.  
IMDG: International Maritime Code for Dangerous Goods.  
DOT: US Department of Transportation.  
IATA: International Air Transport Association.  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.  
ACGIH: American Conference of Governmental Industrial Hygienists.  
NFPA: National Fire Protection Association (USA).  
HMIS: Hazardous Materials Identification System (USA).  
WHMIS: Workplace Hazardous Materials Information System (Canada).  
VOC: Volatile Organic Compounds (USA, EU).  
LC50: Lethal concentration, 50 percent.  
LD50: Lethal dose, 50 percent.

**SDS Created by:**

Global Safety Management, Inc.  
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Tampa, FL, 33647  
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Website: [www.GSMSDS.com](http://www.GSMSDS.com)

# SAFETY DATA SHEET

Methanol (Methyl Alcohol)

## Section 1. Identification

<b>GHS product identifier</b>	: Methanol (Methyl Alcohol)
<b>Chemical name</b>	: methanol
<b>Other means of identification</b>	: Methyl alcohol
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>Synonym</b>	: Methyl alcohol
<b>SDS #</b>	: 001065
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>Emergency telephone number (with hours of operation)</b>	: 1-866-734-3438

## Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: FLAMMABLE LIQUIDS - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (respiratory tract) - Category 1

### GHS label elements

**Hazard pictograms**



**Signal word**

: Danger

**Hazard statements**

: Highly flammable liquid and vapor.  
May displace oxygen and cause rapid suffocation.  
Corrosive to the respiratory tract.

### Precautionary statements

**General**

: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

**Prevention**

: Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor.

**Response**

: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

**Storage**

: Store locked up. Store in a well-ventilated place. Keep cool.

**Disposal**

: Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Date of issue/Date of revision**

: 5/20/2015.

**Date of previous issue**

: 10/16/2014.

**Version** : 0.04

1/14

## Section 2. Hazards identification

**Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

**Substance/mixture** : Substance  
**Chemical name** : methanol  
**Other means of identification** : Methyl alcohol

### CAS number/other identifiers

**CAS number** : 67-56-1  
**Product code** : 001065

Ingredient name	%	CAS number
methanol	100	67-56-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.  
**Inhalation** : May cause respiratory irritation.  
**Skin contact** : No known significant effects or critical hazards.



## Section 4. First aid measures

**Frostbite** : Try to warm up the frozen tissues and seek medical attention.

**Ingestion** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Eye contact** : No specific data.

**Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing

**Skin contact** : No specific data.

**Ingestion** : No specific data.

### Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments** : No specific treatment.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

**Suitable extinguishing media** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.

**Unsuitable extinguishing media** : Do not use water jet.

**Specific hazards arising from the chemical** : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

**Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

## Section 7. Handling and storage

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
methanol	<p><b>ACGIH TLV (United States, 3/2012).</b>  <b>Absorbed through skin.</b>            STEL: 328 mg/m<sup>3</sup> 15 minutes.            STEL: 250 ppm 15 minutes.            TWA: 262 mg/m<sup>3</sup> 8 hours.            TWA: 200 ppm 8 hours.</p> <p><b>NIOSH REL (United States, 1/2013).</b>  <b>Absorbed through skin.</b>            STEL: 325 mg/m<sup>3</sup> 15 minutes.            STEL: 250 ppm 15 minutes.            TWA: 260 mg/m<sup>3</sup> 10 hours.            TWA: 200 ppm 10 hours.</p> <p><b>OSHA PEL (United States, 6/2010).</b>            TWA: 260 mg/m<sup>3</sup> 8 hours.            TWA: 200 ppm 8 hours.</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b>  <b>Absorbed through skin.</b>            STEL: 325 mg/m<sup>3</sup> 15 minutes.            STEL: 250 ppm 15 minutes.            TWA: 260 mg/m<sup>3</sup> 8 hours.            TWA: 200 ppm 8 hours.</p>

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

**Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

## Section 8. Exposure controls/personal protection

- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Liquid. [CLEAR, COLORLESS, FLAMMABLE, POISONOUS LIQUID WITH CHARACTERISTIC PUNGENT ODOR]
- Color** : Colorless. Clear.
- Molecular weight** : 32.05 g/mole
- Molecular formula** : C-H4-O
- Boiling/condensation point** : 64.7°C (148.5°F)
- Melting/freezing point** : -97.8°C (-144°F)
- Critical temperature** : Not available.
- Odor** : Characteristic.
- Odor threshold** : Not available.
- pH** : Not available.
- Flash point** : Closed cup: 9.7°C (49.5°F)
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Evaporation rate** : 2.1 (butyl acetate = 1)
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Lower: 6%  
Upper: 44%
- Vapor pressure** : 16.9 kPa (126.963291808 mm Hg) [room temperature]
- Vapor density** : 1.1 (Air = 1)
- Specific Volume (ft<sup>3</sup>/lb)** :
- Gas Density (lb/ft<sup>3</sup>)** : Not available.

## Section 9. Physical and chemical properties

<b>Relative density</b>	: 0.79
<b>Solubility</b>	: Not available.
<b>Solubility in water</b>	: 1000 g/l
<b>Partition coefficient: n-octanol/water</b>	: -0.77
<b>Auto-ignition temperature</b>	: 455°C (851°F)
<b>Decomposition temperature</b>	: Not available.
<b>SADT</b>	: Not available.
<b>Viscosity</b>	: Dynamic (room temperature): 0.544 to 0.59 mPa·s (0.544 to 0.59 cP)

## Section 10. Stability and reactivity

<b>Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	: The product is stable.
<b>Possibility of hazardous reactions</b>	: Under normal conditions of storage and use, hazardous reactions will not occur.
<b>Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
<b>Incompatibility with various substances</b>	: Extremely reactive or incompatible with the following materials: oxidizing materials.
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Hazardous polymerization</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
methanol	LC50 Inhalation Gas.	Rat	145000 ppm	1 hours
	LC50 Inhalation Gas.	Rat	64000 ppm	4 hours

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
methanol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	40 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-

#### Sensitization

Not available.

#### Mutagenicity

**Date of issue**/Date of revision : 5/20/2015. **Date of previous issue** : 10/16/2014. **Version** : 0.04 7/14

## Section 11. Toxicological information

Not available.

### Carcinogenicity

Not available.

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
methanol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.  
**Inhalation** : May cause respiratory irritation.  
**Skin contact** : No known significant effects or critical hazards.  
**Ingestion** : No known significant effects or critical hazards.

### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : No specific data.  
**Inhalation** : Adverse symptoms may include the following:  
 respiratory tract irritation  
 coughing  
**Skin contact** : No specific data.  
**Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

## Section 11. Toxicological information

<b>General</b>	: No known significant effects or critical hazards.
<b>Carcinogenicity</b>	: No known significant effects or critical hazards.
<b>Mutagenicity</b>	: No known significant effects or critical hazards.
<b>Teratogenicity</b>	: No known significant effects or critical hazards.
<b>Developmental effects</b>	: No known significant effects or critical hazards.
<b>Fertility effects</b>	: No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Not available.

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
methanol	-0.77	<10	low

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations








**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

### United States - RCRA Toxic hazardous waste "U" List

## Section 13. Disposal considerations

Ingredient	CAS #	Status	Reference number
Methanol (I); Methyl alcohol (I)	67-56-1	Listed	U154

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN1230	UN1230	UN1230	UN1230	UN1230
<b>UN proper shipping name</b>	METHANOL	METHANOL	METHANOL	METHANOL	METHANOL
<b>Transport hazard class(es)</b>	3 	3 	3 	3 (6.1)  	3 (6.1)  
<b>Packing group</b>	II	II	-	II	II
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<p><b>Reportable quantity</b> 5000 lbs / 2270 kg [759.08 gal / 2873.4 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.</p> <p><b>Limited quantity</b> Yes.</p> <p><b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: 1 L</p> <p><b>Cargo aircraft</b> Quantity limitation: 60 L</p> <p><b>Special provisions</b> IB2, T7, TP2</p>	<p><b>Explosive Limit and Limited Quantity Index</b> 1</p> <p><b>Passenger Carrying Road or Rail Index</b> 1</p> <p><b>Special provisions</b> 43</p>	-	-	<p><b>Passenger and Cargo Aircraft</b>Quantity limitation: 1 L</p> <p><b>Cargo Aircraft Only</b> Quantity limitation: 60 L</p> <p><b>Limited Quantities - Passenger Aircraft</b> Quantity limitation: 1 L</p>

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user** : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

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



## Section 15. Regulatory information

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
**United States inventory (TSCA 8b)**: This material is listed or exempted.

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Fire hazard  
 Immediate (acute) health hazard

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
methanol	100	Yes.	No.	No.	Yes.	No.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	methanol	67-56-1	100
<b>Supplier notification</b>	methanol	67-56-1	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

**Massachusetts** : This material is listed.

**New York** : This material is listed.

**New Jersey** : This material is listed.

**Pennsylvania** : This material is listed.

### California Prop. 65

**WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

## Section 15. Regulatory information

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
methanol	No.	Yes.	No.	No.

**Canada inventory** : This material is listed or exempted.

### International regulations

#### International lists

- Australia inventory (AICS):** This material is listed or exempted.
- China inventory (IECSC):** This material is listed or exempted.
- Japan inventory:** This material is listed or exempted.
- Korea inventory:** This material is listed or exempted.
- Malaysia Inventory (EHS Register):** Not determined.
- New Zealand Inventory of Chemicals (NZIoC):** This material is listed or exempted.
- Philippines inventory (PICCS):** This material is listed or exempted.
- Taiwan inventory (CSNN):** Not determined.

**Chemical Weapons Convention List Schedule I Chemicals** : Not listed

**Chemical Weapons Convention List Schedule II Chemicals** : Not listed

**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

### Canada

#### WHMIS (Canada)

- : Class B-2: Flammable liquid
- Class D-1B: Material causing immediate and serious toxic effects (Toxic).
- Class D-2A: Material causing other toxic effects (Very toxic).
- Class D-2B: Material causing other toxic effects (Toxic).
- CEPA Toxic substances:** This material is not listed.
- Canadian ARET:** This material is not listed.
- Canadian NPRI:** This material is listed.
- Alberta Designated Substances:** This material is not listed.
- Ontario Designated Substances:** This material is not listed.
- Quebec Designated Substances:** This material is not listed.

## Section 16. Other information

**Canada Label requirements** : Class B-2: Flammable liquid  
 Class D-1B: Material causing immediate and serious toxic effects (Toxic).  
 Class D-2A: Material causing other toxic effects (Very toxic).  
 Class D-2B: Material causing other toxic effects (Toxic).

### Hazardous Material Information System (U.S.A.)

Health	1
Flammability	3
Physical hazards	0

## Section 16. Other information

**Caution:** HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### [National Fire Protection Association \(U.S.A.\)](#)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### [History](#)

**Date of printing** : 5/20/2015.

**Date of issue/Date of revision** : 5/20/2015.

**Date of previous issue** : 10/16/2014.

**Version** : 0.04

**Key to abbreviations** :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- UN = United Nations
- ACGIH – American Conference of Governmental Industrial Hygienists
- AIHA – American Industrial Hygiene Association
- CAS – Chemical Abstract Services
- CEPA – Canadian Environmental Protection Act
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
- CFR – United States Code of Federal Regulations
- CPR – Controlled Products Regulations
- DSL – Domestic Substances List
- GWP – Global Warming Potential
- IARC – International Agency for Research on Cancer
- ICAO – International Civil Aviation Organisation
- Inh – Inhalation
- LC – Lethal concentration
- LD – Lethal dosage
- NDSL – Non-Domestic Substances List
- NIOSH – National Institute for Occupational Safety and Health

## Section 16. Other information

TDG – Canadian Transportation of Dangerous Goods Act and Regulations  
TLV – Threshold Limit Value  
TSCA – Toxic Substances Control Act  
WEEL – Workplace Environmental Exposure Level  
WHMIS – Canadian Workplace Hazardous Material Information System

### References

: Not available.

✔ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



# Fisher Scientific

Part of Thermo Fisher Scientific

## SAFETY DATA SHEET

Creation Date 12-Mar-2009

Revision Date 28-Nov-2016

Revision Number 5

### 1. Identification

**Product Name** Nitric acid (65 - 70%)

**Cat No. :** A198C-212, A200-212, A200-212LC, A200-500, A200-500LC, A200-612GAL, A200C-212, A200S-212, A200S-212LC, A200S-500, A200SI-212, A467-1, A467-2, A467-250, A467-500, A483-212; S719721

**Synonyms** Azotic acid; Engraver's acid; Aqua fortis

**Recommended Use** Laboratory chemicals.

**Uses advised against** No Information available

**Details of the supplier of the safety data sheet**

**Company**  
Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

**Emergency Telephone Number**  
CHEMTREC®, Inside the USA: 800-424-9300  
CHEMTREC®, Outside the USA: 001-703-527-3887

### 2. Hazard(s) identification

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Oxidizing liquids	Category 3
Corrosive to metals	Category 1
Skin Corrosion/Irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

**Label Elements**

**Signal Word**  
Danger

**Hazard Statements**  
May intensify fire; oxidizer  
May be corrosive to metals  
Causes severe skin burns and eye damage  
May cause respiratory irritation

**Precautionary Statements****Prevention**

Do not breathe dust/fume/gas/mist/vapors/spray  
 Wash face, hands and any exposed skin thoroughly after handling  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Use only outdoors or in a well-ventilated area  
 Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
 Keep/Store away from clothing/ other combustible materials  
 Take any precaution to avoid mixing with combustibles  
 Keep only in original container

**Response**

Immediately call a POISON CENTER or doctor/physician

**Inhalation**

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

**Skin**

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 Wash contaminated clothing before reuse

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

**Ingestion**

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

**Fire**

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam for extinction

**Spills**

Absorb spillage to prevent material damage

**Storage**

Store locked up  
 Store in a well-ventilated place. Keep container tightly closed  
 Store in corrosive resistant polypropylene container with a resistant inliner  
 Store in a dry place

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition / information on ingredients

Component	CAS-No	Weight %
Nitric acid	7697-37-2	65 - 70
Water	7732-18-5	30 - 35

### 4. First-aid measures

**General Advice**

Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

**Eye Contact**

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use. Call a physician immediately.
<b>Inhalation</b>	If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove from exposure, lie down. Call a physician immediately.
<b>Ingestion</b>	Do not induce vomiting. Never give anything by mouth to an unconscious person. Clean mouth with water. Call a physician immediately.
<b>Most important symptoms/effects</b>	Causes burns by all exposure routes. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated
<b>Notes to Physician</b>	Treat symptomatically

## 5. Fire-fighting measures

<b>Suitable Extinguishing Media</b>	CO <sub>2</sub> , dry chemical, dry sand, alcohol-resistant foam.
<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	Not applicable
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	No information available
<b>Explosion Limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Oxidizing Properties</b>	Oxidizer
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

### Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Oxidizer: Contact with combustible/organic material may cause fire. May ignite combustibles (wood paper, oil, clothing, etc.).

### Hazardous Combustion Products

Nitrogen oxides (NO<sub>x</sub>) Thermal decomposition can lead to release of irritating gases and vapors

### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

### NFPA

<b>Health</b> 4	<b>Flammability</b> 0	<b>Instability</b> 0	<b>Physical hazards</b> OX
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## 6. Accidental release measures

<b>Personal Precautions</b>	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment.
<b>Environmental Precautions</b>	Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.
<b>Methods for Containment and Clean Up</b>	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Sweep up and shovel into suitable containers for disposal.

## 7. Handling and storage

**Handling** Use only under a chemical fume hood. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not ingest. Do not breathe vapors or spray mist. Keep away from clothing and other combustible materials.

**Storage** Keep containers tightly closed in a cool, well-ventilated place. Do not store near combustible materials.

## 8. Exposure controls / personal protection

### Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Nitric acid	TWA: 2 ppm STEL: 4 ppm	(Vacated) TWA: 2 ppm (Vacated) TWA: 5 mg/m <sup>3</sup> (Vacated) STEL: 4 ppm (Vacated) STEL: 10 mg/m <sup>3</sup> TWA: 2 ppm TWA: 5 mg/m <sup>3</sup>	IDLH: 25 ppm TWA: 2 ppm TWA: 5 mg/m <sup>3</sup> STEL: 4 ppm STEL: 10 mg/m <sup>3</sup>
Component	Quebec	Mexico OEL (TWA)	Ontario TWA/STEL
Nitric acid	TWA: 2 ppm TWA: 5.2 mg/m <sup>3</sup> STEL: 4 ppm STEL: 10 mg/m <sup>3</sup>	TWA: 2 ppm TWA: 5 mg/m <sup>3</sup> STEL: 4 ppm STEL: 10 mg/m <sup>3</sup>	TWA: 2 ppm STEL: 4 ppm

#### Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

**Engineering Measures** Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

### Personal Protective Equipment

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Tightly fitting safety goggles. Face-shield.

**Skin and body protection** Long sleeved clothing.

**Respiratory Protection** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Hygiene Measures** Keep away from food, drink and animal feeding stuffs. When using, do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. For environmental protection remove and wash all contaminated protective equipment before re-use. Wear suitable gloves and eye/face protection.

## 9. Physical and chemical properties

<b>Physical State</b>	Liquid
<b>Appearance</b>	Clear Colorless, Light yellow
<b>Odor</b>	Strong Acrid
<b>Odor Threshold</b>	No information available
<b>pH</b>	< 1.0 (0.1M)
<b>Melting Point/Range</b>	-41 °C / -41.8 °F
<b>Boiling Point/Range</b>	Not applicable
<b>Flash Point</b>	Not applicable



Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	0.94 kPa (20°C)
Vapor Density	No information available
Specific Gravity	1.40
Solubility	miscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	HNO <sub>3</sub>
Molecular Weight	63.02

## 10. Stability and reactivity

Reactive Hazard	Yes
Stability	Oxidizer: Contact with combustible/organic material may cause fire.
Conditions to Avoid	Incompatible products. Combustible material. Excess heat. Exposure to air or moisture over prolonged periods.
Incompatible Materials	Combustible material, Strong bases, Reducing agents, Metals, Powdered metals, Organic materials, Aldehydes, Alcohols, Cyanides, Ammonia, Strong reducing agents
Hazardous Decomposition Products	Nitrogen oxides (NO <sub>x</sub> ), Thermal decomposition can lead to release of irritating gases and vapors
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

## 11. Toxicological information

### Acute Toxicity

#### Product Information

##### Oral LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

##### Dermal LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

##### Vapor LC50

Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

#### Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nitric acid	Not listed	Not listed	LC50 = 2500 ppm. (Rat) 1h
Water	-	Not listed	Not listed

**Toxicologically Synergistic Products** No information available

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Irritation** Causes severe burns by all exposure routes

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Nitric acid	7697-37-2	Not listed	Not listed	Not listed	Not listed	Not listed
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed

**Mutagenic Effects** No information available

<b>Reproductive Effects</b>	No information available.
<b>Developmental Effects</b>	No information available.
<b>Teratogenicity</b>	No information available.
<b>STOT - single exposure</b>	Respiratory system
<b>STOT - repeated exposure</b>	None known
<b>Aspiration hazard</b>	No information available
<b>Symptoms / effects, both acute and delayed</b>	Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated
<b>Endocrine Disruptor Information</b>	No information available
<b>Other Adverse Effects</b>	The toxicological properties have not been fully investigated.

## 12. Ecological information

### Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Nitric acid	Not listed	LC50: = 72 mg/L, 96h (Gambusia affinis)	Not listed	Not listed

**Persistence and Degradability** Miscible with water Persistence is unlikely based on information available.  
**Bioaccumulation/ Accumulation** No information available.

**Mobility** Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Nitric acid	-2.3

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

### DOT

UN-No UN2031  
 Proper Shipping Name NITRIC ACID  
 Hazard Class 8  
 Subsidiary Hazard Class 5.1  
 Packing Group II

### TDG

UN-No UN2031  
 Proper Shipping Name NITRIC ACID  
 Hazard Class 8  
 Subsidiary Hazard Class 5.1  
 Packing Group II

### IATA

UN-No UN2031  
 Proper Shipping Name NITRIC ACID  
 Hazard Class 8  
 Subsidiary Hazard Class 5.1  
 Packing Group II

**IMDG/IMO**

UN-No	UN2031
Proper Shipping Name	NITRIC ACID
Hazard Class	8
Subsidiary Hazard Class	5.1
Packing Group	II

**15. Regulatory information**

All of the components in the product are on the following Inventory lists: X = listed

**International Inventories**

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Nitric acid	X	X	-	231-714-2	-		X	X	X	X	X
Water	X	X	-	231-791-2	-		X	-	X	X	X

**Legend:**

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

**U.S. Federal Regulations**

TSCA 12(b) Not applicable

**SARA 313**

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Nitric acid	7697-37-2	65 - 70	1.0

**SARA 311/312 Hazard Categories**

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	Yes

**CWA (Clean Water Act)**

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Nitric acid	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Nitric acid	-	TQ: 500 lb

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive

Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Nitric acid	1000 lb	1000 lb

**California Proposition 65** This product does not contain any Proposition 65 chemicals

#### U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Nitric acid	X	X	X	X	X
Water	-	-	X	-	-

#### U.S. Department of Transportation

Reportable Quantity (RQ): Y  
 DOT Marine Pollutant N  
 DOT Severe Marine Pollutant N

#### U.S. Department of Homeland Security

This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Nitric acid	2000 lb STQ

#### Other International Regulations

**Mexico - Grade** No information available

#### Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

**WHMIS Hazard Class** C Oxidizing materials  
 E Corrosive material  
 D2B Toxic materials



### 16. Other information

**Prepared By** Regulatory Affairs  
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**Revision Summary** This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

#### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**

# Safety Data Sheet Portland Cement

## Section 1. Identification

<b>GHS product identifier:</b>	Portland Cement
<b>Chemical name:</b>	Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.
<b>Other means of identification:</b>	Cement, ASTM Type I, II, III, V, Portland Limestone Cement, Hydraulic Cement, CSA Type GU, GUb, GUL, MS, MH, MHL, HE, HEL, LH, LHL, HS
<b>Relevant identified uses of the substance or mixture and uses advised against:</b>	Building materials, construction, a basic ingredient in concrete.
<b>Supplier's details:</b>	Lehigh White Cement Company 7660 Imperial Way, Allentown, PA 18195 (610) 366-4600
<b>Emergency telephone number (24 hours):</b>	<b>CHEMTREC: (800) 424-9300</b>

## Section 2. Hazards Identification

Overexposure to portland cement can cause serious, potentially irreversible skin or eye damage in the form of chemical (caustic) burns, including third degree burns. The same serious injury can occur if wet or moist skin has prolonged contact exposure to dry portland cement.

<b>OSHA/HCS status:</b>	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture:</b>	SKIN CORROSION/IRRITATION – Category 1 SERIOUS EYE DAMAGE/EYE IRRITATION – Category 1 SKIN SENSITIZATION – Category 1 CARCINOGENICITY/INHALATION – Category 1A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] – Category 3

### GHS label elements

**Hazard pictograms:**



<b>Signal word:</b>	Danger
<b>Hazard statements:</b>	Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause respiratory irritation. May cause cancer.

<b>Precautionary statements:</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Use outdoors in a well ventilated area. Wash any exposed body parts thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Contaminated clothing must not be allowed out of the workplace.
<b>Prevention:</b>	
<b>Response:</b>	If exposed or concerned: Immediately get medical advice/attention if you feel unwell or irritation or rash occurs. If on skin: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If in eyes: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do. If inhaled: Remove person to fresh air and keep comfortable for breathing. If swallowed: Rinse mouth. Do not induce vomiting.
<b>Storage:</b>	Restrict or control access to stockpile areas (store locked up). Engulfment hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bulk truck or other storage container or vessel that stores or contains cement without an effective procedure for assuring safety. Store in a well ventilated area. Keep container tightly closed.
<b>Disposal:</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.

**Hazards not otherwise classified (HNOC):** None known

**Supplemental Information:** Respirable Crystalline Silica (RCS) may cause cancer. Repeated inhalation of respirable crystalline silica (quartz) may cause lung cancer according to IARC and NTP; ACGIH states that it is a suspected cause of cancer. Other forms of RCS (e.g., tridymite and cristobalite) may also be present or formed under certain industrial processes.

### Section 3. Composition/information on ingredients

**Substance/mixture:** Mixture

**Chemical Name:** Calcium compounds, calcium silicate compounds, and other calcium compounds containing iron and aluminum make up the majority of this product.

### CAS number/other identifiers

Ingredient name	%	CAS number
Portland Cement	100%	65997-15-1
<b>The structure of Portland cement may contain the following in some concentration ranges:</b>		
Calcium oxide	A-B	1305-78-8
Quartz	C-D	14808-60-7
Hexavalent chromium*	E-F	18450-29-9
<b>Portland cement also contains gypsum, limestone and magnesium oxide in various concentrations. However, because these components are not classifiable as a hazard under Title 29 Code of Federal Regulations 1910.1200, they are not required to be listed in this section.</b>		
Gypsum	G-H	13397-24-5
Limestone	I-J	1317-65-3
Magnesium oxide	K-L	1309-48-4

Any concentration shown as a range is to protect confidentiality or is due to process variation.

\*Hexavalent chromium is included due to dermal sensitivity associated with the component.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

### Section 4. First aid measures

#### Description of necessary first aid measures

**Eye Contact:** Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Chemical burns must be treated promptly by a physician.

**Inhalation:** Seek medical help if coughing or other symptoms persist. Inhalation of large amounts of portland cement requires immediate medical attention. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If the individual is not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in a recovery position and get medical attention immediately. Maintain an open airway.

**Skin Contact:** Get medical attention immediately. Heavy exposure to portland cement dust, wet concrete or associated water requires prompt attention. Quickly remove contaminated clothing, shoes, and leather goods such as watchbands and belts. Quickly and gently blot or brush away excess portland cement. Immediately wash thoroughly with lukewarm, gently flowing water and non-abrasive pH natural soap. Seek medical attention for rashes, burns, irritation, dermatitis and prolonged unprotected exposure to wet cement, cement mixtures or liquids from wet cement. Burns should be treated as caustic burns. Portland cement causes skin burns with little warning. Discomfort or pain cannot be relied upon to alert a person to a serious injury. You may not feel pain or the severity of the burn until hours after the exposure. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure.

**Ingestion:** Get medical attention immediately. Call a poison center or physician. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING unless directed to do so by medical personnel. Remove victim to fresh air and keep at rest in a

position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. Stop giving water if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

## Most important symptoms/effects, acute and delayed potential acute health effects

<b>Eye contact:</b>	Causes serious eye damage.
<b>Inhalation:</b>	May cause respiratory irritation.
<b>Skin contact:</b>	Causes severe burns. May cause an allergic skin reaction.
<b>Ingestion:</b>	May cause burns to mouth, throat and stomach.

## Over-exposure signs/symptoms

<b>Eye contact:</b>	Adverse symptoms may include the following: pain, watering and redness.
<b>Inhalation:</b>	Adverse symptoms may include the following: respiratory tract irritation and coughing.
<b>Skin contact:</b>	Adverse symptoms may include the following: pain or irritation, redness and blistering may occur, skin burns, ulceration and necrosis may occur.
<b>Ingestion:</b>	Adverse symptoms may include the following: stomach pains.

## Indication of immediate medical attention and special treatment needed, if necessary

<b>Notes to physician:</b>	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments:</b>	Not applicable.
<b>Protection of first-aiders:</b>	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

<b>Suitable extinguishing media:</b>	Use an extinguishing agent suitable for the surrounding fire.
<b>Unsuitable extinguishing media:</b>	Do not use water jet or water-based fire extinguishers.
<b>Specific hazards arising from the chemical:</b>	No specific fire or explosion hazard.
<b>Hazardous thermal decomposition Products:</b>	Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides and metal oxide/oxides.
<b>Special protective actions for fire-fighters:</b>	Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
<b>Special protective equipment for fire-fighters:</b>	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

<b>For non-emergency personnel:</b>	No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
<b>For emergency responders:</b>	For personal protective clothing requirements, please see Section 8.
<b>Environmental precautions:</b>	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.



Inform the relevant authorities if the product has entered the environment, including waterways, soil or air. Materials can enter waterways through drainage systems.

## Methods and materials for containment and cleaning up

<b>Small spill:</b>	Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of waste material by using a licensed waste disposal contractor.
<b>Large spill:</b>	Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place dust in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Large spills to waterways may be hazardous due to alkalinity of the product. Dispose of waste material using a licensed waste disposal contractor. Note: see section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

<b>Protective measures:</b>	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure by obtaining and following special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material and keep the container tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
<b>Advice on general occupational hygiene:</b>	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
<b>Conditions for safe storage, including any incompatibilities:</b>	A key to using the product safely requires the user to recognize that portland cement reacts chemically with water to produce calcium hydroxide which can cause severe chemical burns. Every attempt should be made to avoid skin and eye contact with cement. Do not get portland cement inside boots, shoes or gloves. Do not allow wet, saturated clothing to remain against the skin. Promptly remove clothing and shoes that are dusty or wet with cement mixtures. Launder/clean clothing and shoes before reuse. Do not enter a confined space that stores or contains portland cement unless appropriate procedures and protection are available. Portland cement can build up or adhere to the walls of a confined space and then release or fall suddenly (engulfment).

## Section 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
Cement, portland, chemicals	<b>ACGIH TLV (United States, 3/2012)</b> TWA: 1 mg/m <sup>3</sup> 8hours. Form: Respirable fraction
	<b>NIOSH REL (United States, 6/2009)</b> TWA: 5 mg/m <sup>3</sup> 10 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 10 hours. Form: Total
	<b>OSHA PEL (United States, 6/2010)</b> TWA: 5mg/m <sup>3</sup> . 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> . 8 hours. Form: Total dust

<b>Calcium oxide</b>	<p><b>ACGIH TLV (United States, 3/2012)</b> TWA: 2 mg/m<sup>3</sup> 8 hours</p> <p><b>NIOSH REL (United States, 6/2009)</b> TWA: 2mg/m<sup>3</sup> 10 hours.</p> <p><b>OSHA PEL (United States, 6/2010)</b> TWA: 5 mg/m<sup>3</sup> 8 hours.</p>
<b>Limestone</b>	<p><b>NIOSH REL (United States, 6/2009)</b> TWA: 5 mg/m<sup>3</sup> 10 hours. Form: Respirable fraction TWA: 10 mg/m<sup>3</sup> 10 hours. Form: Total</p> <p><b>OSHA PEL (United States, 6/2010)</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m<sup>3</sup> 8 hours. Form: Total dust</p>
<b>Magnesium oxide</b>	<p><b>ACGIH TLV (United States, 3/2012)</b> TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Inhalable fraction</p> <p><b>OSHA PEL (United States, 6/2010)</b> TWA: 15 mg/m<sup>3</sup> 8 hours. Form: Total particulates</p>
<b>Quartz</b>	<p><b>ACGIH TLV (United States, 3/2012)</b> TWA: 0.025 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction</p> <p><b>NIOSH REL (United States, 6/2009)</b> TWA: 0.05 mg/m<sup>3</sup> 10 hours. Form: Respirable dust</p> <p><b>OSHA PEL Z-3 (United States, 9/2005)</b> TWA: 10 mg/m<sup>3</sup> divided by % SiO<sub>2</sub> + 2: Respirable TWA: 30 mg/m<sup>3</sup> divided by % SiO<sub>2</sub> + 2: Total</p>
<b>Calcium sulfate (gypsum)</b>	<p><b>ACGIH TLV (United States, 3/2012)</b> TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction</p> <p><b>NIOSH REL (United States, 6/2009)</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m<sup>3</sup> 8 hours. Form: Total dust</p> <p><b>OSHA PEL Z-1 (United States, 2/2006)</b> TWA: 5 mg/m<sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m<sup>3</sup> 8 hours. Form: Total dust</p>

**Appropriate engineering controls:** Use only with adequate ventilation. If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

**Environmental exposure controls:** Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

## Individual protection measures

**Hygiene measures:** Clean water should always be readily available for skin and (emergency) eye washing. Periodically wash areas contacted by portland cement with a pH neutral soap and clean, uncontaminated water. If clothing becomes saturated with portland cement, garments should be removed and replaced with clean, dry clothing.

**Eye/face protection:** To prevent eye contact, wear safety glasses with side shields, safety goggles or face shields when handling dust or wet cement. Wearing contact lenses when working with cement is not recommended.

## Skin protection

<b>Hand protection:</b>	Use impervious, waterproof, abrasion and alkali-resistant gloves. Do not rely on barrier creams in place of impervious gloves. Do not get portland cement inside gloves.
<b>Body protection:</b>	Use impervious, waterproof, abrasion and alkali-resistant boots and protective long-sleeved and long-legged clothing to protect the skin from contact with wet portland cement. To reduce foot and ankle exposure, wear impervious boots that are high enough to prevent portland cement from getting inside them. Do not get portland cement inside boots, shoes, or gloves. Remove clothing and protective equipment that becomes saturated with cement and immediately wash exposed areas of the body.
<b>Other skin protection:</b>	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.
<b>Respiratory protection:</b>	Use properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product, and assigned protection factor of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

<b>Physical State:</b>	Solid. [Powder]	<b>Lower and Upper explosive flammable limits</b>	Not applicable
<b>Color:</b>	Gray or white	<b>Vapor pressure:</b>	Not applicable
<b>Odor:</b>	Odorless	<b>Vapor density:</b>	Not applicable
<b>Odor threshold:</b>	Not available	<b>Relative density:</b>	2.3 to 3.1
<b>pH:</b>	>11.5 [Conc. (% w/w): 1%]	<b>Solubility:</b>	Slightly soluble in water
<b>Melting point:</b>	Not available	<b>Solubility in water:</b>	0.1 to 1%
<b>Boiling point:</b>	>1000°C (>1832°F)	<b>Partition coefficient: n-octanol/water:</b>	Not applicable
<b>Flash point:</b>	Not flammable. Not combustible	<b>Auto-ignition temperature:</b>	Not applicable
<b>Burning time:</b>	Not available	<b>Decomposition temperature:</b>	Not available
<b>Burning rate:</b>	Not available	<b>SADT:</b>	Not available
<b>Evaporation Rate:</b>	Not applicable	<b>Viscosity:</b>	Not applicable
<b>Flammability (solid, gas):</b>	Not applicable		

## Section 10. Stability and reactivity

<b>Reactivity:</b>	Reacts slowly with water forming hydrated compounds, releasing heat and producing a strong alkaline solution until reaction is substantially complete.
<b>Chemical Stability:</b>	The product is stable.
<b>Possibility of hazardous reactions:</b>	Under normal circumstances of storage and use, hazardous reactions will not occur.
<b>Conditions to avoid:</b>	No specific data.
<b>Incompatible materials:</b>	Reactive or incompatible with the following materials: oxidizing materials, acids, aluminum and ammonium salt. Portland cement is highly alkaline and will react with acids to produce a violent, heat-generating reaction. Toxic gases or vapors may be given off depending on the acid involved. Reacts with acids, aluminum metals and ammonium salts. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silicates dissolve readily in hydrofluoric acid producing a corrosive gas-silicon tetrafluoride.
<b>Hazardous decomposition products:</b>	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

<b>Acute toxicity:</b>	Portland Cement LD50/LC50 = Not available
<b>Irritation/Corrosion:</b>	<b>Skin:</b> May cause skin irritation. May cause serious burns in the presence of moisture. <b>Eyes:</b> Causes serious eye damage. May cause burns in the presence of moisture.

**Sensitization:** **Respiratory:** May cause respiratory tract irritation.  
**Mutagenicity:** May cause sensitization due to the potential presence of trace amounts of hexavalent chromium.  
 There are no data available.

**Carcinogenicity:**  
 Classification below:

Product/ingredient name	OSHA	IARC	ACGIH	NTP
Cement, portland, chemicals	-	-	A4	-
Quartz	-	1	A2	Known to be a human carcinogen.

**Reproductive toxicity:** There are no data available.  
**Teratogenicity:** There are no data available.

**Specific target organ toxicity (single exposure)**

Name	Category	Route of Exposure	Target Organs
Calcium oxide	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation
Cement, portland, chemicals	Category 3	Inhalation and skin contact	Respiratory tract irritation, skin irritation

**Specific target organ toxicity (repeated exposure)**

Name	Category	Route of Exposure	Target Organs
Quartz	Category 1	Inhalation	Respiratory tract and kidneys

**Aspiration hazard:** There are no data available.

## Information on the likely routes of exposure

**Potential acute health effects:**  
**Eye contact:** Causes serious eye damage.  
**Inhalation:** May cause respiratory irritation.  
**Skin contact:** Causes severe burns. May cause an allergic skin reaction.  
**Ingestion:** May cause burns to mouth, throat and stomach.

**Symptoms related to the physical, chemical and toxicological characteristics:**  
**Eye contact:** Adverse symptoms may include the following: pain, watering, redness.  
**Inhalation:** Adverse symptoms may include the following: respiratory tract irritation, coughing  
**Skin contact:** Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, skin burns, ulcerations and necrosis may occur  
**Ingestion:** Adverse symptoms may include the following: stomach pains

**Delayed and immediate effects and also chronic effects from short and long term exposure:**  
**Short term exposure**  
 Potential immediate effects: No known significant effects or critical hazards.  
 Potential delayed effects: No known significant effects or critical hazards.

**Long term exposure**  
 Potential immediate effects: No known significant effects or critical hazards.  
 Potential delayed effects: No known significant effects or critical hazards.

**Potential chronic health effects:**  
**General:** Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. If sensitized to hexavalent chromium, a severe allergic dermal reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity:** Portland cement is not classifiable as a human carcinogen. Crystalline silica is considered a hazard by inhalation. IARC has classified crystalline silica as a Group 1 substance, carcinogenic to humans. This classification is based on the findings of laboratory animal studies (inhalation and implantation) and epidemiology studies that were considered sufficient for carcinogenicity. Excessive exposure to crystalline silica can cause silicosis, a non-cancerous lung disease.

**Mutagenicity:** No known significant effects or critical hazards.

**Teratogenicity:** No known significant effects or critical hazards.

**Developmental effects:** No known significant effects or critical hazards.

**Fertility effects:** No known significant effects or critical hazards.

**Numerical measures of toxicity:** Acute toxicity estimates: There are no data available.

## Section 12. Ecological Information

### Toxicity

Product/ingredient name	Result	Species	Exposure
Calcium oxide	Chronic NOEC 100 mg/L Fresh water	Fish-Oreochromis niloticus-Juvenile (Fledgling, Hatchling, Weanling)	46 days

**Persistence and degradability:** There are not data available.  
**Bioaccumulative potential:** There are not data available.  
**Mobility in soil:** Soil/water partition coefficient (Koc): Not available.  
**Other adverse effects:** No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods:** The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Untreated waste should not be released to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe manner. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff, and contact with soil, waterways, drains and sewers.

## Section 14. Transportation information

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	None	None	None
Additional information	-	-	-

**Special precautions for user:** Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.  
 Not available.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:**

## Section 15. Regulatory Information

**TSCA 6 final risk management:** Chromium, ion (Cr6+)

**United States inventory (TSCA 8b):** Cements are considered to be statutory mixtures under TSCA. CAS 65997-15-1 is included on the TSCA inventory.

**CERCLA:** This product is not listed as a CERCLA substance

**Clean Air Act Section 112 (b): Hazardous Air Pollutants (HAPs) –** Not listed

**Clean Air Act Section 602: Class I Substances -** Not listed

**Clean Air Act Section 602: Class II Substances -** Not listed

**DEA List I Chemicals: (Precursor Chemicals) –** Not listed

**DEA List II Chemicals: (Essential Chemicals) –** Not listed

### SARA 311/312

**Classification:** Immediate (acute) health hazard  
Delayed (chronic) health hazard

#### Composition/information on ingredients

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Calcium oxide	A-B	No	No	No	Yes	No
Quartz	>0.1	No	No	No	No	Yes
Chromium, ion (Cr6+)	<0.1	No	No	No	Yes	Yes

### SARA 313

	Product name	CAS number	%
Form R-Report requirements	Chromium, ion (Cr6+)	8540-29-9	<0.1

### State regulations

**Massachusetts:**

The following components are listed: cement, portland, chemicals, limestone

**New York:**

None of the components are listed.

**New Jersey:**

The following components are listed: cement, portland, chemicals, gypsum, limestone

**Pennsylvania:**

The following components are listed: cement, portland, chemicals, gypsum, limestone

### California Prop. 65

**WARNING:** This product contains crystalline silica and chemicals (trace metals) known to the State of California to cause cancer, birth defects or other reproductive harm. California law requires the above warning in the absence of definitive testing to prove the defined risks do not exist.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Quartz	Yes	No	No	No
Chromium, ion (Cr6+)	Yes	Yes	0.001µg/day (inhalation)	8.2 micrograms/day (ingestion)

### International regulations

**International lists:**

**Canadian Domestic Substances List (DSL):** Portland cement is included on the DSL.

**Mexico Inventory (INSQ):** All components are listed or exempted.

## Section 16. Other Information

**Date of issue:** May 21, 2015  
**Version:** May 21, 2015  
**Revised Section(s):** N/Ap

### Notice to reader

While the information provided in this safety data sheet is believed to provide a useful summary of the hazards of portland cement as it is commonly used, the sheet cannot anticipate and provide all of the information that might be needed in every situation. Inexperienced product users should obtain proper training before using this product. In particular, the data furnished in this sheet do not address hazards that may be posed by other materials mixed with portland cement to produce portland cement products. Users should review other relevant material safety data sheets before working with this portland cement or working on portland cement products, for example, portland cement concrete.

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY Lehigh Hanson, except that the product shall conform to contracted specifications. The information provided herein was believed by the Lehigh Hanson to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of product and to determine the suitability of the product for its intended use. Buyer's exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

### Abbreviations

ACGIH — American Conference of Governmental Industrial Hygienists  
CAS — Chemical Abstract Service  
CERCLA — Comprehensive Emergency Response and Comprehensive Liability Act  
CFR — Code of Federal Regulations  
DOT — Department of Transportation  
GHS — Globally Harmonized System  
HEPA — High Efficiency Particulate Air  
IATA — International Air Transport Association  
IARC — International Agency for Research on Cancer  
IMDG — International Maritime Dangerous Goods  
NIOSH — National Institute of Occupational Safety and Health  
NOEC — No Observed Effect Concentration  
NTP — National Toxicology Program  
OSHA — Occupational Safety and Health Administration  
PEL — Permissible Exposure Limit  
REL — Recommended Exposure Limit  
RQ — Reportable Quantity  
SARA — Superfund Amendments and Reauthorization Act  
SDS — Safety Data Sheet  
TLV — Threshold Limit Value  
TPQ — Threshold Planning Quantity  
TSCA — Toxic Substances Control Act  
TWA — Time-Weighted Average  
UN — United Nations

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**APPENDIX C: JOB HAZARD ANALYSIS**

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## Job Hazard Analysis

### Environmental Assessment & Remediations 225 Atlantic Avenue, Patchogue, NY 11772

<b>Site:</b> DEC-COLLEGE POINT OIL LAGOON	<b>Date Created:</b> 02/13/2018
<b>Job Task:</b> Temporary Soil Vapor Monitoring Point Installations	<b>Development Team:</b> IH, JH
<b>Review Team:</b> JH	<b>Review Date:</b>
<b>Minimum Required Equipment:</b>	
Reflective vest	Nitrile gloves
Hard hat	Work gloves
Steel toed boots	Goggles
Hearing protection	Protective clothing

Job Step	Potential Accidents or Hazards	Quality/Safe Work Practices
Vehicle Operation	<p>Collision (vehicle or object)</p> <p>Getting vehicles stuck or decreased mobility in an emergency</p> <p>Personnel being struck</p>	<p>Use spotters when backing up vehicles and equipment. Spotters are required when backing, but they may be necessary for forward moving vehicles too. Inspect the work area by walking around the vehicle and equipment to identify any potential striking hazards. Insure back up alarms are functioning properly if vehicle or equipment is so equipped.</p> <p>Inspect the work area prior to moving vehicles. Use a spotter, as described above. Consider whether a tire repair contact or trip management plan needs to be prepared prior to Site activities. Use an alternate route, if possible, when road hazards are present.</p> <p>All field personnel are to wear ANSI high visibility vests. Reflective hard hats must also be worn when working around operating vehicles, machinery, or along active roadways. Be aware of surroundings and locations of personnel when operating vehicle.</p>
General Field Activities	<p>Slips, trips, falls</p> <p>Dangerous animals and vegetation</p>	<p>Be aware of your surroundings (rough terrain, debris, unstable surfaces, etc). Wear boots/shoes with skid resistant soles and steel-toes. Practice good housekeeping.</p> <p>Identify and avoid toxic plants such as poison ivy. If identified, warn others of location. Wear long sleeves. Be alert for dangerous animals such as raccoons, aggressive dogs, or dangerous insects.</p>

Temp. VMP Installation - JHA

	<p>Muscle strain</p> <p>Heat/cold stress</p> <p>Misuse of hand tools (slips, falls, abrasions, cuts, eye injuries)</p> <p>Exposure to potentially contaminated media</p>	<p>Do not lift objects/equipment heavier than you are capable of lifting without assistance (ie &gt;50 lbs). Keep back straight and bend at the knee. Keep object close to body and avoid twisting. Use mechanical assistance and tools as necessary.</p> <p>Wear proper attire. Takes breaks as necessary to stay warm/cool off. Keep hydrated.</p> <p>Ensure proper training has been conducted prior to using a particular piece of equipment. Ensure proper inspection of said equipment prior to use. Mark all faulty equipment and remove from use. Wear appropriate PPE as required for the type of tool used.</p> <p>All employees to have 40-hr OSHA HAZWOPER training with current 8-hr refresher. Wear goggles and nitrile gloves when handling potentially contaminated equipment such as water meters. Follow decontamination procedures outlined in the HASP. Review and understand MSDS for potential contaminants. No eating, drinking, or smoking is permitted in work area. Remove PPE and wash hands before eating or drinking. Implement work zone air monitoring as outlined in the HASP. Decontaminate equipment between boring locations.</p>
<p>Generator Use</p>	<p>Electrocution</p> <p>Fire and explosion</p> <p>Asphyxiation/exhaust</p>	<p>Always use grounded equipment and keep electrical equipment away from water. Inspect power cables for signs of wear or fraying. Replace any equipment or cables that show signs of wear. Do not use equipment with missing covers or exposed/frayed wires. Repairs to be made by qualified technicians only.</p> <p>Allow unit to cool 5-10 minutes prior to refueling. Avoid spills during refueling. Check that an operable fire extinguisher is present on support vehicle. Store gas only in dedicated fuel containers. Keep gas containers away from heat sources. No smoking is permitted onsite.</p>

Temp. VMP Installation - JHA

		Use generator only in well ventilated areas. Keep generator downwind of work area.
Drilling Location/Setup	<p>Drilling into underground utilities</p> <p>Striking overhead lines or objects with drill mast</p> <p>Rig/equipment damage, personnel injury</p>	<p>NY811 shall be notified of drilling activities and proposed locations several days prior to beginning work. All utilities shall be located via GPR and conductive means, marked, and verified prior to beginning work. All locations shall be pre-cleared to 5-feet below grade surface.</p> <p>Observe overhead lines, tree limbs, or other objects before raising mast. Anticipate radius of sweep going up and coming down and plan appropriately. Position drill rig no closer than 15 feet from overhead power lines.</p> <p>Trained operator shall inspect rig and equipment prior to beginning work. Inspect any hydraulic hoses for leaks and proper connections.</p>
DPT Drilling (General)	<p>Physical injury from moving parts of machinery, including changeout of drill rods.</p> <p>Muscle strain</p> <p>Weather extremes/lightning</p> <p>Noise/hearing damage</p>	<p>Avoid moving parts if machinery. Keep fingers, hands, and arms away from moving parts and pinch points. Do not wear loose-fitting clothing or items such as rings and watches that could get caught in moving parts. Wear work gloves, hard hat, and steel-toed boots at all times. Keep all drill bits secured when not in use. Rig is only to be operated by trained personnel. Follow "show me your hands" protocol.</p> <p>Do not lift objects/equipment heavier than you are capable of lifting without assistance (ie &gt;50 lbs). Keep back straight and bend at the knee. Keep object close to body and avoid twisting. Use mechanical assistance and tools as necessary.</p> <p>Be aware of weather forecast. Do not raise mast or operate equipment if lightning is present.</p> <p>Hearing protection shall be worn at all times during hammer operation.</p>

## Job Hazard Analysis

### Environmental Assessment & Remediations 225 Atlantic Avenue, Patchogue, NY 11772

<b>Site:</b> DEC-COLLEGE POINT OIL LAGOON	<b>Date Created:</b> 02/13/2018
<b>Job Task:</b> Environmental Sampling	<b>Development Team:</b> IH, JH
<b>Review Team:</b> JH	<b>Review Date:</b>
<b>Minimum Required Equipment:</b>	
Reflective vest Hard hat Steel toed boots	Nitrile gloves Goggles Protective clothing

Job Step	Potential Accidents or Hazards	Quality/Safe Work Practices
Vehicle Operation	<p>Collision (vehicle or object)</p> <p>Getting vehicles stuck or decreased mobility in an emergency</p> <p>Personnel being struck</p>	<p>Use spotters when backing up vehicles and equipment. Spotters are required when backing, but they may be necessary for forward moving vehicles too. Inspect the work area by walking around the vehicle and equipment to identify any potential striking hazards. Insure back up alarms are functioning properly if vehicle or equipment is so equipped.</p> <p>Inspect the work area prior to moving vehicles. Use a spotter, as described above. Consider whether a tire repair contact or trip management plan needs to be prepared prior to Site activities. Use an alternate route, if possible, when road hazards are present.</p> <p>All field personnel are to wear ANSI high visibility vests. Reflective hard hats must also be worn when working around operating vehicles, machinery, or along active roadways. Be aware of surroundings and locations of personnel when operating vehicle.</p>
General Field Activities	<p>Slips, trips, falls</p> <p>Dangerous animals and vegetation</p>	<p>Be aware of your surroundings (rough terrain, debris, unstable surfaces, etc). Wear boots/shoes with skid resistant soles and steel-toes. Practice good housekeeping.</p> <p>Identify and avoid toxic plants such as poison ivy. If identified, warn others of location. Wear long sleeves. Be alert for dangerous animals such as raccoons, aggressive dogs, or dangerous insects.</p>

Environmental Sampling - JHA

	<p>Muscle strain</p> <p>Heat/cold stress</p> <p>Misuse of hand tools (slips, falls, abrasions, cuts, eye injuries)</p> <p>Vehicle/pedestrian encroachment</p>	<p>Do not lift objects/equipment heavier than you are capable of lifting without assistance (ie &gt;50 lbs). Keep back straight and bend at the knee. Keep object close to body and avoid twisting. Use mechanical assistance and tools as necessary.</p> <p>Wear proper attire. Takes breaks as necessary to stay warm/cool off. Keep hydrated.</p> <p>Ensure proper training has been conducted prior to using a particular piece of equipment. Ensure proper inspection of said equipment prior to use. Mark all faulty equipment and remove from use. Wear appropriate PPE as required for the type of tool used.</p> <p>Use traffic cones and signage to delineate work zone. All field personnel are to wear ANSI high visibility vests. Reflective hard hats must also be worn when working around operating vehicles, machinery, or along active roadways.</p>
<p>Generator Use</p>	<p>Electrocution</p> <p>Fire and explosion</p> <p>Asphyxiation/exhaust</p>	<p>Always use grounded equipment and keep electrical equipment away from water. Inspect power cables for signs of wear or fraying. Replace any equipment or cables that show signs of wear. Do not use equipment with missing covers or exposed/frayed wires. Repairs to be made by qualified technicians only.</p> <p>Allow unit to cool 5-10 minutes prior to refueling. Avoid spills during refueling. Check that an operable fire extinguisher is present on support vehicle. Store gas only in dedicated fuel containers. Keep gas containers away from heat sources. No smoking is permitted onsite.</p> <p>Use generator only in well ventilated areas. Keep generator downwind of work area.</p>
<p>Groundwater Sampling</p>	<p>Exposure to potentially contaminated media</p>	<p>All employees to have 40-hr OSHA HAZWOPER training with current 8-hr refresher. Wear goggles and nitrile gloves when collecting samples and handling potentially contaminated equipment. Follow decontamination procedures outlined in the HASP. Review and understand MSDS for potential</p>

Environmental Sampling - JHA

	<p>Exposure to sample preservation chemicals</p> <p>Slip/trip hazards</p>	<p>contaminants. No eating, drinking, or smoking is permitted in work area. Remove PPE and wash hands before eating or drinking.</p> <p>Be careful when handling sample containers containing acid or caustic preservatives. Wear goggles and nitrile gloves when handling sample containers. Avoid inhalation of fumes from containers. Open containers in well ventilated areas. Know and understand MSDS for chemicals being handled.</p> <p>Be alert. Position equipment in an orderly and safe fashion. Exercise good housekeeping practices.</p>
<p>Soil Vapor Sampling</p>	<p>Exposure to potentially contaminated media</p> <p>Slip/trip hazards</p> <p>Handling compressed gases</p>	<p>All employees to have 40-hr OSHA HAZWOPER training with current 8-hr refresher. Wear goggles and nitrile gloves when collecting samples and handling potentially contaminated equipment. Follow decontamination procedures outlined in the HASP. Review and understand MSDS for potential contaminants. No eating, drinking, or smoking is permitted in work area. Remove PPE and wash hands before eating or drinking.</p> <p>Be alert. Position equipment in an orderly and safe fashion. Exercise good housekeeping practices.</p> <p>Use caution not to dislodge regulator from apex of tracer gas tank. Store and secure tanks properly.</p>

## Job Hazard Analysis

### Environmental Assessment & Remediations 225 Atlantic Avenue, Patchogue, NY 11772

<b>Site:</b> DEC-COLLEGE POINT OIL LAGOON	<b>Date Created:</b> 02/13/2018
<b>Job Task:</b> Well Installations	<b>Development Team:</b> IH, JH
<b>Review Team:</b> JH	<b>Review Date:</b>
<b>Minimum Required Equipment:</b>	
Reflective vest	Nitrile gloves
Hard hat	Work gloves
Steel toed boots	Goggles
Hearing protection	Protective clothing

Job Step	Potential Accidents or Hazards	Quality/Safe Work Practices
Vehicle Operation	Collision (vehicle or object)	Use spotters when backing up vehicles and equipment. Spotters are required when backing, but they may be necessary for forward moving vehicles too. Inspect the work area by walking around the vehicle and equipment to identify any potential striking hazards. Insure back up alarms are functioning properly if vehicle or equipment is so equipped.
	Getting vehicles stuck or decreased mobility in an emergency	Inspect the work area prior to moving vehicles. Use a spotter, as described above. Consider whether a tire repair contact or trip management plan needs to be prepared prior to Site activities. Use an alternate route, if possible, when road hazards are present.
	Personnel being struck	All field personnel are to wear ANSI high visibility vests. Reflective hard hats must also be worn when working around operating vehicles, machinery, or along active roadways. Be aware of surroundings and locations of personnel when operating vehicle.
General Field Activities	Slips, trips, falls	Be aware of your surroundings (rough terrain, debris, unstable surfaces, etc). Wear boots/shoes with skid resistant soles and steel-toes. Practice good housekeeping.
	Dangerous animals and vegetation	Identify and avoid toxic plants such as poison ivy. If identified, warn others of location. Wear long sleeves. Be alert for dangerous animals such as raccoons, aggressive dogs, or dangerous insects.
	Muscle strain	

Well Installations - JHA

	<p>Heat/cold stress</p> <p>Misuse of hand tools (slips, falls, abrasions, cuts, eye injuries)</p> <p>Exposure to potentially contaminated media</p>	<p>Do not lift objects/equipment heavier than you are capable of lifting without assistance (ie &gt;50 lbs). Keep back straight and bend at the knee. Keep object close to body and avoid twisting. Use mechanical assistance and tools as necessary.</p> <p>Wear proper attire. Takes breaks as necessary to stay warm/cool off. Keep hydrated.</p> <p>Ensure proper training has been conducted prior to using a particular piece of equipment. Ensure proper inspection of said equipment prior to use. Mark all faulty equipment and remove from use. Wear appropriate PPE as required for the type of tool used.</p> <p>All employees to have 40-hr OSHA HAZWOPER training with current 8-hr refresher. Wear goggles and nitrile gloves when handling potentially contaminated equipment such as water meters. Follow decontamination procedures outlined in the HASP. Review and understand MSDS for potential contaminants. No eating, drinking, or smoking is permitted in work area. Remove PPE and wash hands before eating or drinking. Implement work zone air monitoring as outlined in the HASP. Decontaminate equipment between boring locations.</p>
<p>Generator Use</p>	<p>Electrocution</p> <p>Fire and explosion</p> <p>Asphyxiation/exhaust</p>	<p>Always use grounded equipment and keep electrical equipment away from water. Inspect power cables for signs of wear or fraying. Replace any equipment or cables that show signs of wear. Do not use equipment with missing covers or exposed/frayed wires. Repairs to be made by qualified technicians only.</p> <p>Allow unit to cool 5-10 minutes prior to refueling. Avoid spills during refueling. Check that an operable fire extinguisher is present on support vehicle. Store gas only in dedicated fuel containers. Keep gas containers away from heat sources. No smoking is permitted onsite.</p>



Well Installations - JHA

		Use generator only in well ventilated areas. Keep generator downwind of work area.
Mixing Grout / Operating Grout Pump	Dust from bentonite/cement  Pinch point/hand injury	Avoid breathing dust. Position yourself and others upwind when mixing. Use of dust masks is at the discretion of the field members. Use of Tyvek suiting at the discretion of the field members. Add water first.  Wear work gloves over nitrile. Avoid using open blade knives to open bags. Keep non-essential personnel away from mixer. Communicate intent with other personnel and utilize “show me your hands” practices before operating pump.
Concrete/asphalt removal via Jackhammer or Breaker Bar	Flying concrete  Misuse of tools – general injury  Excessive noise	Wear goggles and/or face shield to protect against eye injury. Communicate intentions with other personnel. Establish a control zone to ensure pedestrian traffic and/or vehicles/property are not affected.  Ensure proper training has been conducted prior to using a particular piece of equipment. Ensure proper inspection of said equipment prior to use. Mark all faulty equipment and remove from use. Wear appropriate PPE as required for the type of tool used.  Utilize hearing protection when operating jackhammer. Hearing protection must be worn when working around operating equipment if levels are greater than 85 dba. Establish hand signals for major activities (ie. stop, go, caution, etc).
Concrete Saw/Sawcutter Operation	Misuse of tool – general injury  Excessive noise	Operator shall be properly trained in the use of the tool. Ensure work area is clear of other workers. Inspect saw and blade prior to use. Ensure manufacturer’s protective devices are in place and operational. Inspect and clear anticipated blade path prior to starting saw. Eye protection, heavy-duty gloves, and steel toed boots shall be worn.  Utilize hearing protection when operating jackhammer. Hearing protection must be worn when working around operating equipment if levels are greater than 85 dba. Establish hand signals for major activities (ie. stop, go, caution, etc).

Well Installations - JHA

	<p>Harmful dust / asphyxiation / exhaust / Crystalline Silica Dust Inhalation</p> <p>Fire and explosion</p>	<p>Use watering to minimize dust protection. Use saw only in well ventilated area. Utilize dust masks or P-100 HEPA mask if dust is being generated. Follow “Crystalline Silica Health &amp; Safety Document”.</p> <p>Allow unit to cool 5-10 minutes prior to refueling. Avoid spills during refueling. Check that an operable fire extinguisher is present on support vehicle. Store gas only in dedicated fuel containers. Keep gas containers away from heat sources. No smoking is permitted onsite.</p>
Drilling Location/Setup	<p>Drilling into underground utilities</p> <p>Striking overhead lines or objects with drill mast</p> <p>Rig/equipment damage, personnel injury</p>	<p>NY811 shall be notified of drilling activities and proposed locations several days prior to beginning work. All utilities shall be located via GPR and conductive means, marked, and verified prior to beginning work. All locations shall be pre-cleared to 5-feet below grade surface.</p> <p>Observe overhead lines, tree limbs, or other objects before raising mast. Anticipate radius of sweep going up and coming down and plan appropriately. Position drill rig no closer than 15 feet from overhead power lines.</p> <p>Trained operator shall inspect rig and equipment prior to beginning work. Inspect any hydraulic hoses for leaks and proper connections.</p>
Gravel Pack Installation	Crystalline Silica Dust Inhalation	Use a continuous ‘water delivery system’ to minimize dust protection. Work in well ventilated area. Utilize P-100 HEPA mask during installation. Follow “Crystalline Silica Health & Safety Document”.
Drilling (General)	<p>Physical injury from moving parts of machinery, including changeout of augers/drill pipe and core barrel.</p> <p>Muscle strain</p>	<p>Avoid moving parts if machinery. Keep fingers, hands, and arms away from rotating parts. Do not wear loose-fitting clothing or items such as rings and watches that could get caught in moving parts. Wear work gloves, hard hat, and steel-toed boots at all times. Keep all drill bits secured when not in use. Rig is only to be operated by trained personnel. Follow “show me your hands” protocol.</p> <p>Do not lift objects/equipment heavier than you are capable of lifting without assistance (ie &gt;50 lbs). Keep back straight and bend at the knee. Keep object close to body and</p>

Well Installations - JHA

	Weather extremes/lightning	avoid twisting. Use mechanical assistance and tools as necessary.  Be aware of weather forecast. Do not raise mast or operate equipment if lightning is present.
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**APPENDIX D: ACCIDENT/INCIDENT REPORT FORM**

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Long Island Environmental Assessment, Inc.  
(dba Environmental Assessment & Remediations)

ACCIDENT/INCIDENT REPORT

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Location of Incident: \_\_\_\_\_

Time of Incident: \_\_\_\_\_ Date and Time Reported: \_\_\_\_\_

Who Reported To: \_\_\_\_\_

Police/ Medical Involvement: \_\_\_\_\_

Hospital Name: \_\_\_\_\_

Copy of Police Report Incuded: \_\_\_\_\_ Officers Name: \_\_\_\_\_

Injured/Fatalities: \_\_\_\_\_

Description of Incident: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Long Island Environmental Assessment, Inc.  
(dba Environmental Assessment & Remediations)

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Witness Names: \_\_\_\_\_

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Additional Information: \_\_\_\_\_

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**APPENDIX E: ACKNOWLEDGEMENT**

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I have read the Health & Safety Plan for this site (**EAR SITE ID: DEC-Brooklyn-Spencer**). I understand fully and agree to follow the procedures contained in it.

Employee Name (Print)	Employee Signature	Company	Date

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**APPENDIX C - WASTE TRANSPORTER PERMIT**

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# WASTE TRANSPORTER PERMIT

## GENERAL CONDITIONS

### The permittee must:

1. Carry a copy of this waste transporter permit in each vehicle to transport waste. Failure to produce a copy of the permit upon request is a violation of the permit.
2. Display the full name of the transporter on both sides of each vehicle and display the waste transporter permit number on both sides and rear of each vehicle containing waste. The displayed name and permit number must be in characters at least three inches high and of a color that contrasts sharply with the background.
3. Transport waste only in authorized vehicles. An authorized vehicle is one that is listed on this permit.
4. Submit to the Department a modification application for additions/deletions to the authorized fleet of vehicles. The permittee must wait for a modified permit before operating the vehicles identified in the modification application.
5. Submit to the Department a modification application to add a new waste category or a new destination facility, or to change the current waste or destination facility category. The permittee must wait for a modified permit before transporting new waste types or transporting to new destination facilities.
6. Submit to the Department a modification application for change of address or company name.
7. Comply with requirements for placarding and packaging as set forth in New York State Transportation Law as well as any applicable federal rules and regulations.
8. Contain all wastes in the vehicle so there is no leaking, blowing, or other discharge of waste.
9. Use vehicles to transport only materials not intended for human or animal consumption unless the vehicle is properly cleaned.
10. Comply with requirements for manifesting hazardous waste, regulated medical waste, or low-level radioactive waste as set forth in the New York State Environmental Conservation Law and the implementing regulations. Transporters who provide a pre-printed manifest to a generator/shipper/offeror of regulated waste shall ensure that all information is correct and clearly legible on all copies of the manifest.
11. Deliver waste only to transfer, storage, treatment and disposal facilities authorized to accept such waste. Permittee must demonstrate that facilities are so authorized if requested to do so.
12. Maintain liability insurance as required by New York State Environmental Conservation Law.
13. Maintain records of the amount of each waste type transported to each destination facility on a calendar-year basis. The transporter is obligated to provide a report of this information to the Department at the time of permit renewal, or to any law enforcement officer, if requested to do so.
14. Pay regulatory fees on an annual basis. Non-payment may be cause for revocation or suspension of permit.
15. This permit is not transferrable. A change of ownership will invalidate this permit.
16. This permit does not relieve the permittee from the obligation to obtain any other approvals or permits, or from complying with any other applicable federal, state, or local requirement.
17. **Renewal applications must be submitted no less than 30 days prior to the expiration date of the permit to:**

**New York State Department of Environmental Conservation  
Division of Materials Management, Waste Transporter Program  
625 Broadway, 9<sup>th</sup> Floor  
Albany, NY 12233-7251**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF MATERIALS MANAGEMENT

**PART 364**  
**WASTE TRANSPORTER PERMIT NO. 1A-1036**

Pursuant to Article 27, Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

**PERMIT ISSUED TO:**

ISLAND PUMP & TANK CORP  
40 DOYLE COURT  
EAST NORTHPORT, NY 11731

**PERMIT TYPE:**

- NEW  
 RENEWAL  
 MODIFICATION

CONTACT NAME: FRANK DIANDREA  
COUNTY: SUFFOLK  
TELEPHONE NO: (631)462-2226

EFFECTIVE DATE: 02/07/2017  
EXPIRATION DATE: 02/07/2018  
US EPA ID NUMBER: NYR000191726

**AUTHORIZED WASTE TYPES BY DESTINATION FACILITY: (Continued)**

The Permittee is Authorized to Transport the Following Waste Type(s) to the Destination Facility listed :

Destination Facility	Location	Waste Type(s)	Note
NORTHLAND ENVIRONMENTAL, LLC	PROVIDENCE , RI	Hazardous Industrial/Commercial	
Posillico Materials	Farmingdale , NY	Petroleum Contaminated Soil	
REPUBLIC ENVIRONMENTAL SYSTEMS (TRANSPORTATION GROUP) LLC	HATFIELD , PA	Non-Hazardous Industrial/Commercial Petroleum Contaminated Soil Hazardous Industrial/Commercial	
SUFFOLK CO SD#3 BERGEN POINT STP	WEST BABYLON , NY	Non-Hazardous Industrial/Commercial	
TRADEBE (FORMERLY UNITED RECYCLING INC)	BRIDGEPORT , CT	Non-Hazardous Industrial/Commercial Petroleum Contaminated Soil Hazardous Industrial/Commercial Waste Oil	
TRADEBE TREATMENT & RECYCLING NORTHEAST, LLC	MERIDEN , CT	Non-Hazardous Industrial/Commercial Petroleum Contaminated Soil Hazardous Industrial/Commercial Waste Oil	
Tully Environmental, Inc. d/b/a Clearbrook	Deer Park , NY	Non-Hazardous Industrial/Commercial Petroleum Contaminated Soil Grease Trap Waste Non-Residential Raw Sewage or Sewage-Contaminated Wastes	
VEOLIA ES TECHNICAL SOLUTIONS	FLANDERS , NJ	Non-Hazardous Industrial/Commercial Hazardous Industrial/Commercial	

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
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EFFECTIVE DATE: 02/07/2017  
EXPIRATION DATE: 02/07/2018  
US EPA ID NUMBER: NYR000191726

**AUTHORIZED VEHICLES:**

The Permittee is Authorized to Operate the Following Vehicles to Transport Waste:

(Vehicles enclosed in <>'s are authorized to haul Residential Raw Sewage and/or Septage only)

13 (Thirteen) Permitted Vehicle(s)

NY 18110MG  
NY 38993PC  
NY 38994PC  
NY 38995PC  
NY 38996PC  
NY 38997PC  
NY 53182PC  
NY 60461JV  
NY 81385JW  
NY 85821MD  
NY 85822MD  
NY 92793MD  
NY BF54332  
End of List