Proj. _____
Proj # _____
File Code: _____

HEALTH AND SAFETY PLAN
Former Ford Manufacturing Company Mill Site
New York State Department of Environmental Conservation

Shaw Project Number: 134685
Contract Number: D006132

December 2009

Prepared for:

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12110
Prepared by:

Shaw Environmental & Infrastructure Engineering of New York, P.C.
13 British American Boulevard
Latham, NY 12110-1405

Program Manager

Health and Safety Manager

The information in this HASP has been designed for the methods presently contemplated by Shaw Environmental & Infrastructure Engineering of New York, P.C. (Shaw) for execution of the proposed work. Therefore, this HASP may not be appropriate if the work is not performed by or using the methods presently contemplated by Shaw. In addition, as the work is performed, conditions different from those anticipated may be encountered and the HASP may have to be modified. Therefore, Shaw only makes representations or warranties as to the adequacy of the HASP for currently anticipated activities and conditions.

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Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
COC	Contaminants of Concern
CRZ	Contamination Reduction Zone
DOT	Department of Transportation
ERCP	Emergency Response and Contingency Plan
EZ	Exclusion Zone
FID	Flame Ionization Detector
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
HSR	Health and Safety Representative
IDLH	Immediately Dangerous to Life or Health
JSA	Job Safety Analysis
LO/TO	Lockout/Tagout
MHR	Maximum Heart Rate
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PE	Professional Engineer
PEL	Permissible Exposure Limit
PID	Photoionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
REL	Recommended Exposure Limits
SHSO	Site Health and Safety Officer
SM	Site Manager
SS	Site Supervisor
SSO	Site Safety Officer
SZ	Support Zone
TLV	Threshold Limit Values
WBGT	Wet Bulb Globe Temperature

Table 1 Site Emergency Form

Category	Information
Possible Contaminants of Concern	No. 2 fuel oil, Naphthalene, benzene, toluene, ethylbenzene, xylene and coal ash.
Minimum Level of Protection	Level D
Hazard Determination*	See Site Specific Information
Office Telephone	Town of Waterford – 518-237-0422
Site Location Address	127 2nd St. Village of Waterford, NY

**See Section 7.0 of the Master HASP for site emergency contingency procedures. Do not endanger your own life. Survey the situation before taking any action.*

Table 2 Emergency Phone Numbers*

Contact	Phone Number
Ambulance	911
Fire	911
Police	911
Poison Control	1-800-222-1212
Local Shaw Corp. Medical Provider	Access Health Systems
Shaw, Medical Case Manager	Dr. Jerry H. Berke, MD, MPH, Health Resources (781) 935-8581 (direct dial) (800) 350-4511 (toll free)
Hospital Name	Albany Medical Center
Occupational Clinic Name	Access Health Systems
Program Manager	David Stoll 518-785-2362
Project Manager (PM)	Marc Flanagan 518-785-2348
Site Safety & Health Officer (SSHO)	Robert Adams 518-894-1320
Health & Safety Rep (HSR)	Greg McElroy 412-858-1542
Client Contact	Michael P. Mclean
National Response Center	800-424-8802
NYCDEC State Agency	NYDEC Region 5
Shaw Transportation Spill Emergency Information (CHEM-TREC)	800-424-9300
Shaw (Hot Line)	866-299-3445

**In the event of any emergency contact Project Manager (PM) or the Health and Safety Representatives*

Figure1

Site Location: 127 2nd Street, Waterford, NY 12188

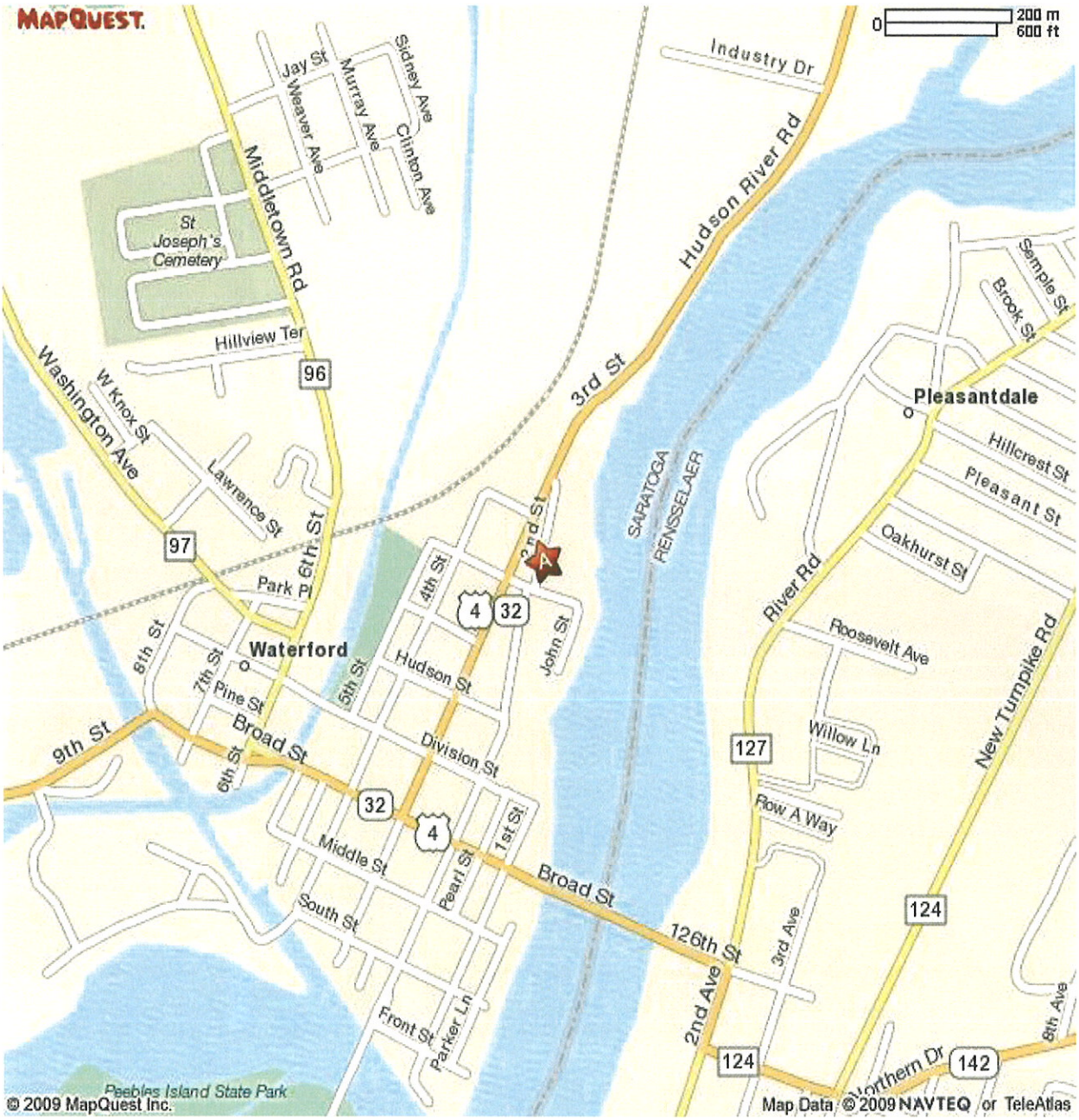
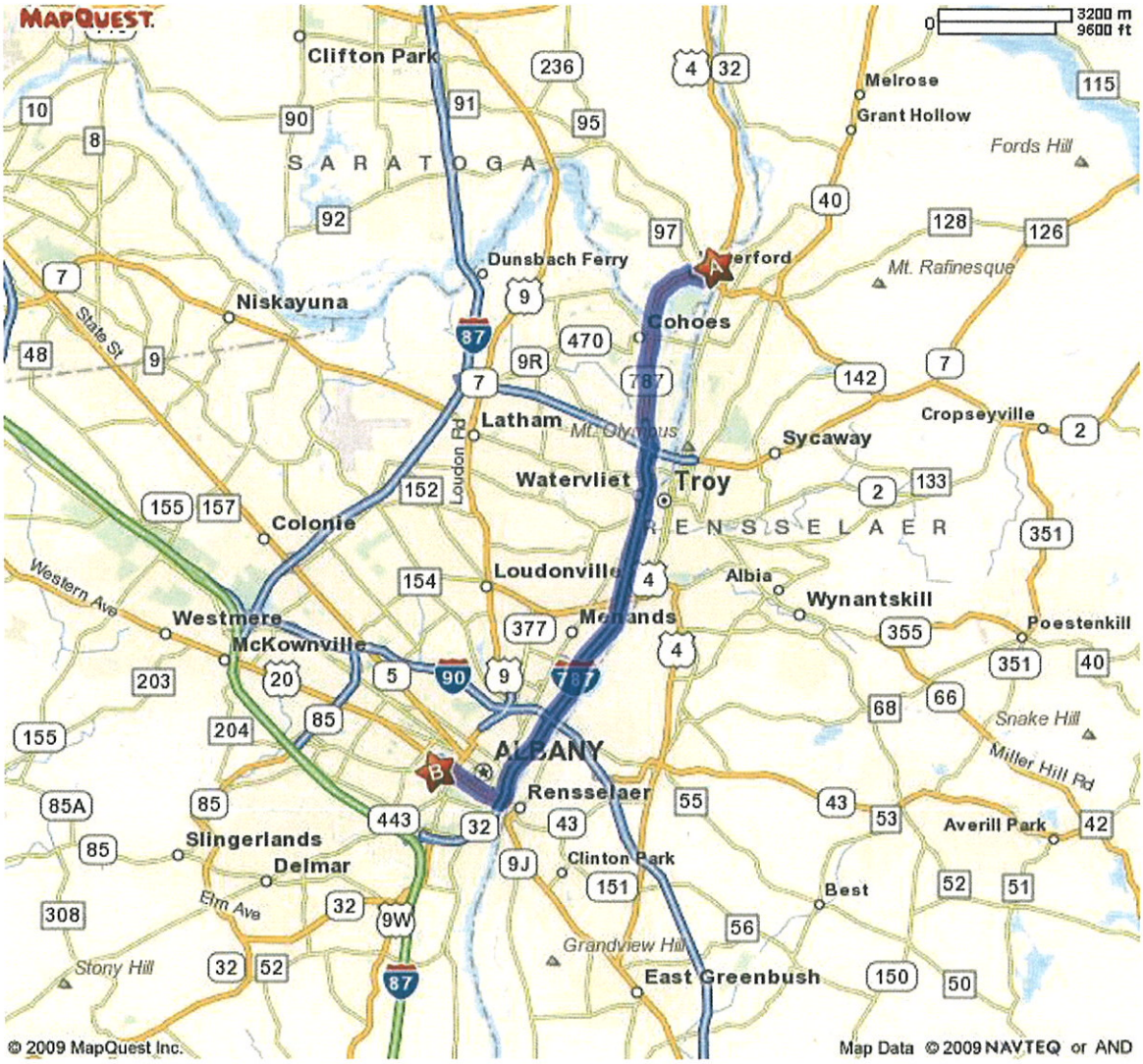


Figure 2
Hospital Map



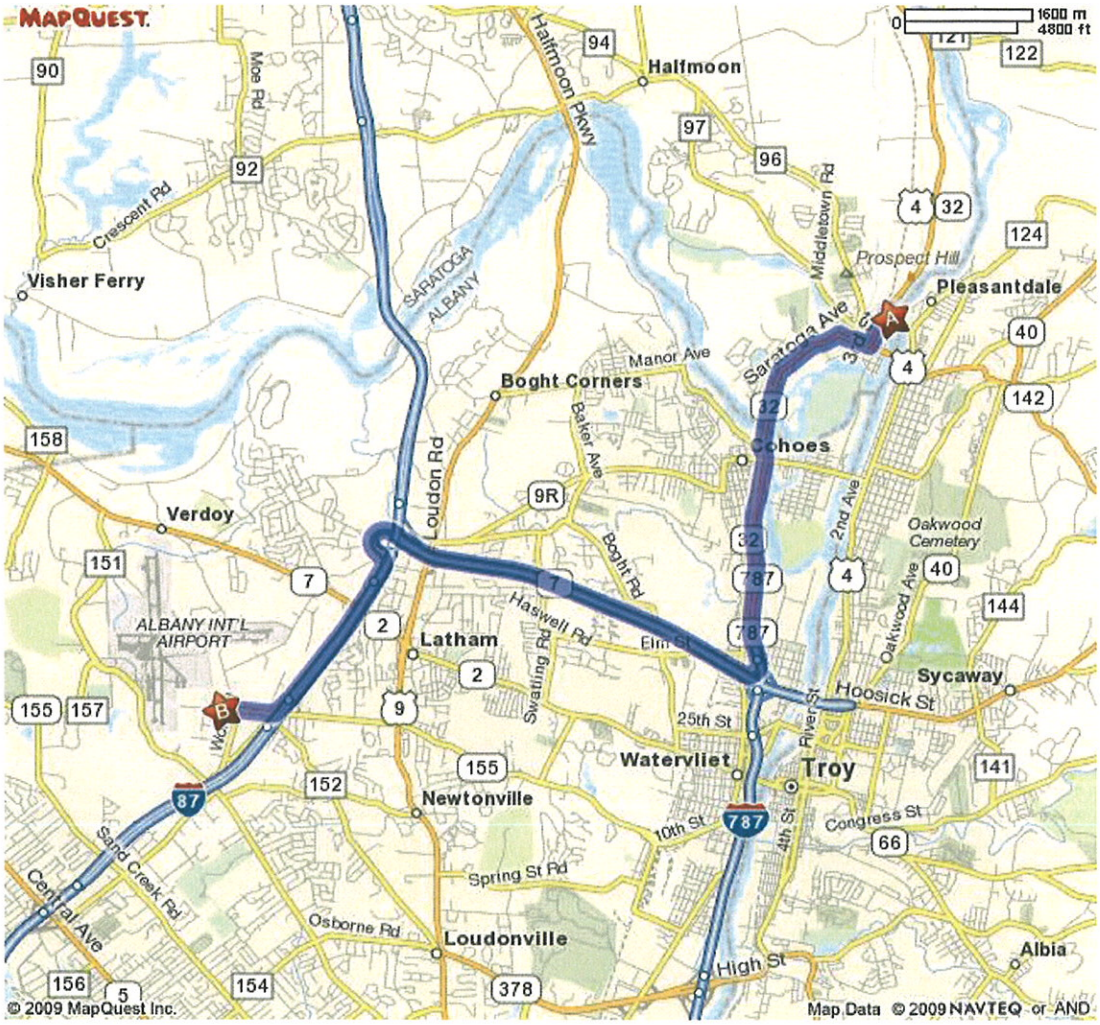
Hospital Directions:

North on 2ns St toward 3rd St/ US-4/NY-32. 0.1 mi
Turn Left onto 3rd St/ US-4/NY-32. 0.4 mi
Turn Right onto Broad ST/ NY-32. 0.1 mi
Keep Left at the fork to continue on NY-32 Broad St. 0.2 mi
Turn Left onto NY-32/9th St. Continue to follow NY-32. 1.4 mi
Turn Slight Left onto NY-787 S. 2.6 mi
NY 787 S necomes I-787 S. 7.2 mi
Take the Madison Ave exit, exit 3B toward US-20 W/ Port of Albany. 0.1 mi
Stay Straight to go onto Madison Ave. 1.3 mi
Turn Left onto New Scotland Ave. 0.2 mi
End at 43 New Scotland Ave. 0.0 mi

Hospital Information:

Category	Information
Name:	Albany Medical Center
Address:	43 New Scotland Ave,
City, State:	Albany, NY
Phone:	518-262-3125
Emergency Phone:	518-262-3131

Figure 3
Occupational Clinic Map



Occupational Clinic Directions

Go North on 2nd ST toward 3rd St/US-4/NY-32. 0.1 mi
Turn Left onto 3rd ST/US-4/NY-32. 0.4 mi
Turn Right onto Broad St/ NY-32. 0.1 mi
Keep Left at the fork to continue on NY-32/Broad St.0.2 mi
Turn Slight Left onto NY-32/ 9th St. S. 1.4 mi
Turn Slight Left onto NY-787 S. 2.1 mi
Take the RT-7 W exit, Exit 9W, toward Schenectady/I-87/ Saratoga Springs. 0.2 mi
Merge onto NY-7 W. 4.2 mi
Merge onto I-87 S via the exit on the Left toward Albany. 1.4 mi
Take the RT-155 E exit, Exit 5, toward Latham. 0.2 mi
Turn Slight Right onto NY-155/ Watervliet Shaker Rd. Continue to follow Watervliet-Shaker Rd. 0.5 mi
776A Watervliet-Shaker Rd is on the left.

Occupational Clinic Information:

Category	Information
Name:	Access Health Systems
Address:	776A Watervliet-Shaker Rd.
City, State:	Latham, NY
Phone:	518 782-2200
Emergency Phone:	518-786-1875

1.0 Introduction

The policy of Shaw Environmental, Inc. (Shaw) is to provide a safe and healthful work environment for all employees. Shaw considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency and shortcuts. Shaw believes that all accidents and injuries are preventable. Shaw will take every reasonable step to reduce the possibility of injury, illness, or accident.

This Site Specific Health and Safety Plan's (HASP) provides the site specific information required in the Master HASP. The objective is to help establish safe working conditions at the site. Safety procedures and protective equipment are chosen according to potential hazards. Specific hazard control methods have been evaluated and selected to minimize the potential of accident or injury.

This HASP prescribes the procedures that must be followed during specific site activities. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM).

The provisions of this plan and the Master HASP are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of this plan. All project participants will attend a pre-job briefing where the contents of this HASP will be discussed. Project staff assigned to this project must sign the Agreement and Acknowledgement Sheet (see Appendix A) to confirm that they understand and agree to abide by the provisions of this plan.

All work will comply with the Occupational Safety and Health Act (OSHA) standard, "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120), Shaw Health and Safety Procedures, and other federal, state, and local procedures that require the development and implementation of a HASP. Generation of this document certifies that the workplace has been evaluated for hazards. A hazard assessment has been performed and the adequacy of the personal protective equipment (PPE) selected was evaluated as required by 29 CFR 1910.132(d), 1910.134, 1926.25, and 1926.55, and is duly noted by the signature(s) and date appearing on the cover page of this document.

1.1 Site Description/Background Information

The site once housed the Ford Manufacturing/Reis Knitting Company Mill, a large textile mill complex that primarily manufactured men's knit underwear. The Ford Manufacturing Company, founded on December 15, 1891, was the fourth oldest manufacturing plant in Waterford. It was incorporated by John W. Ford and was first located at 37 Fourth Street. Sometime between 1891 and 1895 the structure burned down and a new factory was built on Second Street in August, 1896. Between the years of 1897 and 1934 the mill underwent a series of changes and expansions including the addition of a dye house in 1909.

Robert Reis and Company bought the Ford Mill in October, 1919 and built a large addition to the south in 1924. Drawings of the mill indicate that the fuel for the complex was coal and the power source was electricity.

Robert Reis and Company were major suppliers for the U.S. Government during WWII using 90% of the plant to produce wool and cotton blend garments for the U.S. Navy. The mill complex was later used for warehouse space. They continued to operate the knitting mill through the 1960's. Portions of the building were demolished in the 1970's. The site was purchased by the Water Commissioners of the Town of Waterford in 1986 and the remainder of the site was cleared in 1990.

Twelve soil borings were advanced on the site in the summer of 2005 in preparation for construction of the new water treatment plant. Several of these borings encountered black silty sand, fuel oil odor, and coal ash. A 20,000 gallon storage tank (~10 feet in diameter by 36 feet long) that contained approximately 3,000 gallons of fuel oil was discovered. This tank was removed by Town personnel. A second 20,000 gallon tank reportedly exists at the site according to discussions with site personnel and information provided to Shaw.

Test pits were dug on the site in October of 2007 as part of a Supplemental Phase 1B archeological investigation requested by the Office of Parks, Recreation, and Historic Preservation (OPRHP). Areas of fuel oil contamination were discovered at a depth of 5-6 feet south of the previously identified impacts.

1.2 Scope of Work

The Scope of work includes but is not limited to a geophysical survey, excavation of test pits and related soil sampling, removal of a 20,000 gallon underground storage tank (UST), installation of 8 direct-push borings, completion of these borings as monitoring wells and the collection and

laboratory analysis of groundwater samples from the 8 monitoring wells at the former Ford Manufacturing Company Mill Site located at 127 2nd Street, Village of Waterford, Saratoga County, New York.

1.3 Key Safety Personnel

Shaw will oversee and act accordingly during all phases of the project. The following management structure will be instituted to successfully and safely complete this project.

The following people share responsibility for health and safety at the site. See Section 1.3.1 for a description of the role and responsibility of each.

Program Manager	
David Stoll	(office) 518-785-2362 (cellular) 518-526-2322
Project Manager	
Marc Flanagan	(office) 518-785-2348 (cellular) 518-89-1182
Site Supervisor	
Marc Flanagan	(office) 518-785-2348 (cellular) 518-89-1182
Site Health and Safety Office	
Robert Adams	(office) 518-785-2342 (cellular) 518-894-1320
Client Representative	
Michael P McLean	(office) 518-897-1242
Health and Safety Manager	
Greg McElroy	(office) 412-858-1542
Director, Health & Safety	
Clifford Florczak	(office) 312-499-3503

1.3.1 Responsibilities of Key Personnel

1.3.1.1 Project Manager

The Project Manager (PM) has authority to direct response operations; the PM assumes total control over site activities. In addition, the PM:

- Prepares and organizes background review of the project, the work plan, and the field team.
- Obtains permission for site access and coordinates activities with appropriate officials.
- Sees that the work plan is properly executed and completed on schedule.
- Briefs the Site Supervisor (SS), Site Health and Safety Officer (SHSO), and field personnel on specific assignments.
- Together with the SS and SHSO, ensures that health and safety requirements are met.
- Consults with the Health Safety Representative (HSR) regarding unsafe conditions, incidents, or changes in site conditions or the scope of work.
- Ensures Company Accident/Incident report procedures are followed in the event of any site health and safety issues or incidents (see Appendix B).

1.3.1.2 Site Supervisor

The SS Reports to the PM; has authority to direct response operations and assumes control over on-site activities. In addition the SS:

- Conducts daily safety meetings.
- Executes the work plan and schedule.
- Manages the construction operations.
- In conjunction with the SHSO, conducts periodic field health and safety inspections to ensure compliance with this HASP.
- Enforces safety procedures.
- Coordinates with the SHSO in enforcing worker protection levels.
- Enforces site control.
- Notifies, when necessary, local public emergency officials.
- In conjunction with the SHSO, responsible for following-up on incident reports to the PM.

1.3.1.3 Site Health and Safety Officer

The SHSO advises the PM on all aspects of health and safety on site. The SHSO stops work if site operations threaten worker or public health and safety and informs the HSR of any changes in site conditions or project status. In addition, the SHSO:

- Conducts periodic inspections to assess whether the HASP is being followed.
- Periodically inspects protective clothing and equipment.
- Sees that protective clothing and equipment are properly stored and maintained.
- Controls entry and exit at the access control points.
- Performs air monitoring in accordance with this HASP. Maintains and oversees operation of monitoring equipment and interpretation of data from the monitoring equipment.
- Monitors workers for signs of stress, including heat stress, cold exposure, and fatigue.
- Enforces the "buddy" system.
- Is informed of emergency procedures, evacuation routes, and telephone numbers of the local hospital, poison control center, fire department, and police department.
- Notifies, when necessary, local public emergency officials.
- Communicates incidents promptly to SS and PM.
- Maintains communication with HSR on site activities.
- If applicable, ensures decontamination and disposal procedures are followed.
- Maintains the availability of required equipment.
- Advises appropriate health services and medical personnel of potential exposures.
- Notifies emergency response personnel in the event of an emergency. Coordinates emergency medical care.

1.3.1.4 Work Team

The Work Team reports to the SS for on-site activities. Work parties must comprise at least two people for trench entry. In addition, the Work Team:

- Safely completes on-site tasks required to fulfill the work plan.
- Complies with the HASP.
- Attends and participates in daily safety meetings.
- Notifies the SS and SHSO of suspected unsafe conditions.
- Reports all incidents to the SS and SHSO.

2.0 Hazard Analysis

See Section 2.1 for the chemical hazards caused by groundwater contamination. See Section 2.2 for chemical handling procedures to be followed when handling corrosive materials. JSAs for specific work tasks will be developed in the field. They will be appropriate for site conditions and will be reviewed during daily tailgate safety meetings. Any JSAs developed for ongoing operations will be included in Appendix C. See Section 3.1 for general guide-lines that are common to most projects.

Any change in the scope of work will require an amendment to this HASP. Any task con-ducted beyond the scope of work identified in this HASP must be evaluated using the JSA process. The PM and Site Manager (SM) will be responsible for identifying conditions that are beyond the scope of work and communicating to the HSR. The HSRs will work with the PM and SM to develop JSAs or provide guidance in the development of JSAs. JSAs will be reviewed and approved by the HSR and PM by the HASP amendment prior to initiating the task. See **Appendix B** for the JSA format. The completed JSAs must accompany the HASP.

A JSA, according to Shaw policy and procedure HS045, will be completed daily of each tasks by the site supervisor or foreman responsible for the task(s). The SSO will facilitate the process and help guide the supervisor in correctly assessing each task for the proper hazards and controls. JSAs are completed in-depth at the beginning of each task identified herein, and for new tasks that develop. However, as the work progresses, the JSAs are modified each day to address changes in work practices, site conditions, process changes, or unusual occurrences. If no modifications are necessary, the JSAs must still be completed, noting such. As work changes can happen at any time, these JSAs may be necessary to be modified more than once a day per task.

The supervisor, foreman, and SSO share the responsibility to review these JSAs with the work crew each day and when JSAs are modified on such days. The JSA 045 procedure al-lows for signature of work crews, who must sign the bottom form of the JSA for the task that they are working on, acknowledging that they have been briefed. The JSA process is actually the same as a "safe work permit," where the supervisor or foreman grants permission to work only after the initial assessment of hazards has been made and proper work controls or injury minimization measures have been communicated and understood by affected workers.

Although daily JSAs capture the changes that may occur throughout the project, the changes that are made shall be used to update the initial JSA (045) weekly or bi-weekly. This is important, especially for long-term projects, in that it serves to maintain an up-to-date JSA for reference and/or training/orientation purposes.

Although this HASP and the Master HASP contain the safety requirements for the identified work tasks, this process is critical to identifying changes in the hazard scenario or identifying new hazards that need to be addressed. If there are any questions regarding this process or assistance is required, contact the local health and safety manager or Project CIH.

2.1 Contaminants of Concern Profile

See Table 4 for a summary profile of the hazards and control measures to follow for the contaminants of concern (COC). This profile is based on recent site history and site characterization. For more detailed and specific information, always refer to the Material Safety Data Sheet (MSDS) or equivalent information for the compound (see Appendix D).

Table 3 Contaminants of Concern Profile

Contaminant	Physical/Chemical Characteristics (Target Organs/ Route of Entry)	OSHA PELs TWA (STEL)	ACGIH TLVs TWA (STEL)	NIOSH REL TWA (STEL)
No. 2 Fuel Oil	Red or reddish/orange liquid.	5 mg/m³	0.2 mg/m³ A2 skin	
Naphthalene	White Crystals (solid) component of No.2 Fuel Oil.	10 ppm TWA	10 ppm/ 15 ppm STEL	250ppm IDLH
Benzene	Colorless Liquid	5 ppm TWA/ 1 STEL	2.5 ppm/ 0.5 STEL	
Ethylbenzene	Colorless Liquid	125 ppm/100 STEL	125 ppm/100 STEL	125 ppm/100 STEL
Toluene	Colorless Liquid	300 ppm/200 STEL		150 ppm/100 STEL
Xylene	Colorless Liquid		150 ppm/100 STEL	
Coal Ash	Grayish powder	15 ppm	10 ppm	

Ca – Substances that NIOSH considers to be potential occupational carcinogens
C – Ceiling
NIOSH – National Institute for Occupational Safety and Health
OSHA – Occupational Safety and Health Administration
PEL – Permissible exposure limit
REL – Recommended exposure limit
STEL – Short-term exposure limit
TWA – Time-weighted average
TLV – Threshold limit values

2.2 Personal Protective Equipment (PPE)

The minimum level of PPE should be selected according to the hazards that may be encountered during site activities. Only PPE that meets the following American National Standards Institute (ANSI) standards are to be worn. At a minimum, all workers will wear the following protection while working on the site:

- Eye protection - ANSI Z87.1-1989.
- Head protection - ANSI Z89.1-1986.
- Foot protection - ANSI Z41-1991.
- Traffic vest in high traffic areas and around heavy equipment.

2.2.1 Project Specific Equipment

See Table 7 for PPE requirements for sites; see Table 8 for task-specific level requirements. Level D is the minimum acceptable level for sites where petroleum hydrocarbons are the COC. Upgrade to Modified Level D occurs when there is a possibility that contaminated media can contact the skin or work uniform. Upgrade to Level C occurs when the results of air monitoring reveals that action levels have been exceeded. Upgrade to Level B occurs when the results of air monitoring reveals action levels have been exceeded (site personnel must have met training requirements). Wear hearing protection when there are high noise levels. Workers must maintain proficiency in the use and care of PPE that is to be worn.

Table 4 Personal Protection Equipment

Level	Requirements
Level D	Work uniform Steel-toed boots Approved safety glasses or goggles Hard hat
Modified Level D-1	Level D Nitrile gloves.
Modified Level D-2	Level D PE-coated Tyvek suit. Nitrile outer and inner liner gloves. Latex booties or rubber overboots. Hearing protection (muffs and/or plugs). Fluorescent vest is required.
Modified Level D-3	Modified Level D-2 PE-coated Tyvek suit. Nitrile outer and inner liner gloves. Latex booties or rubber over boots. Face shield Face shield, goggles, metatarsal/leg guards for high pressure washing
Level C	Level D and Modified Level D-2. NIOSH/MSHA-approved full-face respirator with organic vapor/acid gas oil proof high efficiency (P100) cartridges.
Level B	Level D and Modified Level D NIOSH/MSHA approved full-face positive pressure demand supplied air respirator, either airline or self-contained.

Prior to using, all equipment must be inspected to ensure proper working condition.

Table 5 Task Specific Air Monitoring/PPE Summary

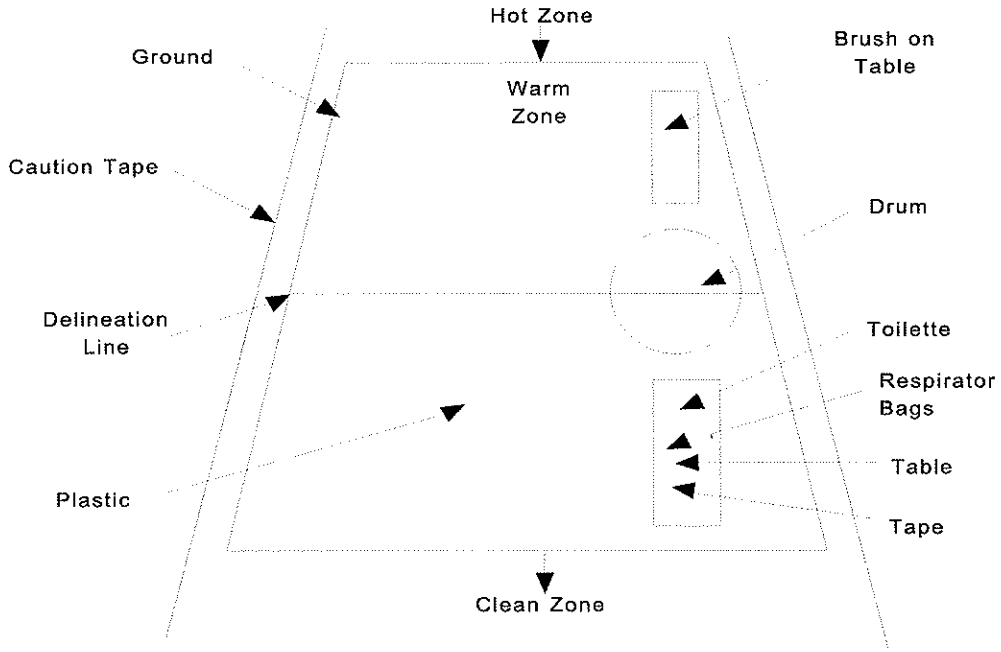
Job Task	PPE Level	Instrument	Frequency
Soil and Groundwater sample collection	Modified Level D-1	PID	Start up of work at each task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached.
Monitoring Well Installation.	Level D	PID and LEL	Start up of work at each task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached.
Remediation system installation	Level D or modified Level D-1	PID and LEL	Air monitoring required during any digging or drilling at start up of work at each task location, then every 30 – 60 minutes based upon air monitoring results. Monitor 15 minutes to continuously if action levels have been reached.
General site duties, system O&M, operation of equipment, etc.	Level D	N/A	N/A

Note 1: "Start up of work at each new task location" means to monitor the air quality at each new operation on the site. The breathing zone is the area inside a 1-foot radius around the head.

Note 2: A downgrade in the air monitoring program must be approved by the SHSO and HSR.

FIGURES

Figure 4
Contamination Reduction Zone



APPENDICES

Appendix A

Safety Plan Acknowledgement Form

I have read the site-safety plan for this site and fully understand its contents.

Date	Name	Company

Appendix B

H&S Site Logs And Forms

SITE ENTRY LOG

Date: ______________________________ Client: ______________________________

Location: ______________________________ Job No.: ______________________________

Name	Representing	Time In	Time Out

TAILGATE SAFETY MEETING FORM

Project Name/Number:_____ Date:_____ Time: _____

Client:_____

Work Activities:_____

Hospital Name/Address:_____

Hospital Phone No.:_____ Ambulance Phone No.:_____

Safety Topics Presented

Chemical Hazards:_____

_____

Physical Hazards:_____

_____

Personal Protective Equipment:

Activity:_____ PPE Level:_____

Activity:_____ PPE Level:_____

Activity:_____ PPE Level:_____

Activity:_____ PPE Level:_____

Activity:_____ PPE Level:_____

New Equipment:_____

Other Safety Topic(s):_____

Attendees

PRINTED NAME	SIGNATURE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting conducted by:

_____ _____

REAL TIME AIR MONITORING LOG
(PID/FID/LEL/O2)

Project Name _____Project Location_____Project No._____

Date	Analyst	Time	Manufacturer Model/Serial No.	Concentration (Units)	Location/Activity

PID/FID DETECTOR
CALIBRATION LOG

Project Name_____ Project No._____ Date_____

Calibrated by_____ Instrument: Mfg/Model/Serial No._____

Time	Probe Type	Battery Charged (Y/N)	Calibration Standard	Calibration Standard Concentration (ppm)	Span Setting	Meter Scale Setting	Zeroed (Y/N)	Expected Meter Reading (ppm)	Actual Meter Reading (ppm)

COMBUSTIBLE GAS/OXYGEN METER CALIBRATION LOG

Project Name_____ Project No._____ Date_____

Calibrated by_____ Instrument: Mfg/Model/Serial No._____

Time	Battery Charged (Y/N)	Audible Alarm Check (Y/N)		Zero Checked (Y/N)		Calibration Standard	Calibration Standard (%)		Actual Meter Reading (%)		Ambient Air Rezero Check	
		LEL	O_2	LEL (0%)	O_2 (20.8%)		LEL	O_2	LEL	O_2	LEL (0%)	O_2 (20.8%)

COLORIMETRIC DETECTOR TUBE LOG

Project Name_____ Project No._____ Date_____

Pump Type, Mfg/Model/Serial No._____ Sampled by_____

Time	Detector Tube Type/ (Expiration Date)	Measurable Range	Pump Leak Test (Y/N)	Pump Strokes	Measured Concentration	Comments

REAL TIME AEROSOL MONITORING LOG

Project Name_____ Project No._____ Date_____

Sampled By	Instrument Type (Mfg/Model/ Serial No.)	Battery Charged (Y/N)	Zeroed (Y/N)	Sample Time		Sample Readings (mg/m^3)			Comments
				Start	Finish	TWA	Shift Average	Direct	

General Weather Conditions:_____

Shaw®

Equipment Services Group

VEHICLE INSPECTION

UNIT NO: _____ **DATE:** _____
MILEAGE: _____ **CURRENT PROJECT NO:** _____
VEHICLE TYPE: _____ **LICENSE NUMBER:** _____
INSPECTED BY: _____ **FUEL FRONT:** _____
EMPLOYEE NUMBER: _____ **FUEL REAR:** _____

For Authorized Repairs On Donlen Vehicles, Call 1-800-323-1483

RETAIN THIS INSPECTION DOCUMENT IN PROJECT FILES

PRE-TRIP _____ **Yes / No** **DAILY (USACE Project)** _____ **Yes / No**

N / A = NOT APPLICABLE **C** = COMMENTS **O** = OKAY **N** = NEEDS ATTENTION

_____	Exterior / Interior Clean	_____	Engine Oil, Oil Pressure
_____	Lights: Head-Tail-Turn-Stop-Emergency-Backup	_____	Transmission Oil & Drive Line
_____	Operating Controls / Gauges	_____	Radiator / Cooling System
_____	Battery / Starter / Horn	_____	Exhaust / Muffler
_____	Air Conditioner / Heater / Defroster	_____	Front Axle / Steering / Suspension System
_____	Back-up Alarm (Trucks)	_____	Donlen Coupon Book
_____	Windshield, Other Glass, Wipers / Washers	_____	First Aid Kit
_____	Mirrors: Inside-Outside (Convex - trucks)	_____	Fire Extinguisher (mounted/accessible/charged)
_____	Insurance Card & Accident Report Kit	_____	Emergency Flares or Reflective Markers
_____	Emergency Phone Number List	_____	Tires / Wheels / Rims
_____	Map to Urgent Care Facility & Hospital	_____	Spare Tire, Jack, Lug Wrench
_____	Current Registration, Plates	_____	Frame / Bumpers
_____	Service Brakes, Emergency/Parking Brakes	_____	Seat Belts (One for Each Passenger)
_____	Trailer Aux Brake Controller/Electrical Connection	_____	Visible Damage to Body
_____	Coupling Devices/Safety Chain Anchor Point	_____	Driver Safety Notification Sticker
_____	Wheel Chocks (When Equipped With Trailer)	_____	Other, Please Enter Comments Below

Was Unit Serviced? Y / N **DATE** **MILES**

COMMENTS: _____

I am authorized to operate this vehicle. _____ Initials

I am licensed to operate this vehicle. _____ Initials

INSPECTORS SIGNATURE: **DATE:**

REPORT ALL DEFICIENCIES TO YOUR SUPERVISOR

Unit #	_____	**Start Date**	_____
Mileage	_____	**Project #**	_____
Vehicle Type	_____	**License #**	_____
Inspected By	_____	**Fuel Front**	_____
Employee #	_____	**Fuel Rear**	_____

DAILY VEHICLE INSPECTION (Weekly Log)

For Authorized repairs on Donlen Vehicles, Call 1-800-323-1483

N/A = Not Applicable C = Comments O = Okay N = Needs Attention	**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**	**FRI**
Exterior/Interior Clean							
Lights: Head-Tail-Turn-Stop-Emergency-Back Up							
Operating Controls/ Gauges							
Battery/ Starter/ Horn							
Air Conditioner/ Heater/ Defroster							
Back-up Alarm (Trucks)							
Windshield, Other Glass, Wipers/Washer							
Mirrors: Inside-Outside (Convex-Trucks)							
Insurance Card & Accident Report Kit							
Emergency Phone Number List							
Map to Urgent Care Facility & Hospital							
Current Registration, Plates							
Service Brakes, Emergency/Parking Brake							
Trailer Aux. Brake Controller/Electrical Connection							
Coupling Devices/Safety Chain Anchor Point							
Wheel Chocks (When Equipped with Trailer)							

N/A = Not Applicable C = Comments O = Okay N = Needs Attention	SAT	SUN	MON	TUE	WED	THU	FRI
Engine Oil, Oil Pressure							
Transmission Oil & Drive Line							
Radiator/Cooling System							
Exhaust/ Muffler							
Front Axle/Steering/Suspension System							
Donlen Coupon Book							
First Aid Kit							
Fire Extinguisher (mounted/accessible/charged)							
Emergency Flares or Reflective Markers							
Tires/Wheels/Rims							
Spare Tire, Jack, Lug Wrench							
Frame/Bumpers							
Seat Belts (One for Each Passenger)							
Visible Damage to Body							
Driver Safety Notification Sticker							
Other, Please Enter Comments Below							
Was Unit Serviced? Yes/ No	Date Serviced				Miles		

Comments:

I have been authorized and I am licensed to operate this vehicle.

INSPECTORS SIGNATURE: **DATE:**

PLEASE REPORT ALL DEFICIENCIES TO YOUR SUPERVISOR

RETAIN THIS INSPECTION DOCUMENT IN PROJECT FILES

Supervisor's Employee Injury Report

EMPLOYEE INFORMATION

Employee's Social Security Number:			Claim Number:
Employee's Full Name:			Case Number from Log:
Home Address:			Home Phone Number:
Male:	Female	Date of Birth:	Hire Date:
Dependents:		Dependents Under 18:	Marital Status:
Occupation:			Department Name:
State Hired:	Currently Weekly Wage:		Hourly Wage:
Hours/Days Worked Per Week:	Days Per Week		Hours Worked Per Day:
Employment Stats:			Employee ID No.: N/A
Salaried Continued:		Paid For Date of Injury:	
Ever Injured on the Job:		Supervisor Name & Phone:	

EMPLOYER INFORMATION

Employer Name: **The Shaw Group, Inc.**

Work Location:	Project Number:
Contact Name: John Mollere	Telephone Number: **(800) 747-3322, Ext.572**
Employer SIC:	Employer Location Code:
Employer FED ID:	Employer Code: N/A

Nature of Business:

Policy Number:

ACCIDENT INFORMATION

Date and Time of Injury:	Time Employee Began Work:
Person Accident Reported to:	Date and Time Reported to Employer:
Did the Accident Occur at the Work Location:	If no, where did the accident occur?

Accident Address:

What was the Employee doing just before the Incident Occurred?

Give a Full Description of the Accident: (Be as Complete As Possible)

What object or substance directly harmed the employee?

Are Other WC Claims Involved?

INJURY INFORMATION

Which Part of the Body Was Injured? (E.g. Head, Neck, Arm Leg)?

What Was the Nature of Injury? (E.g. Fracture, Sprain, Laceration)?

Part of Body Location: (e.g. Left, Right, Upper, Lower)?

Injury Description:

Source of Injury:	Is Employee Hospitalized?
Lost Time: If Yes, What was First Full Day Out:	
Date Last Day Worked:	Date Disability Began: N/A
Date Returned to Work:	Estimated Return Date: N/A

If the Employee Died, When did Death Occur? (Date)

MEDICAL INFORMATION

Initial Medical Treatment:	ER Treated & Released: Y or N	Hospitalized Overnight as In Patient: Y or N

Hospital - Name, Address, Phone Number:

Clinic - Name, Address, Phone Number:

Name of Physician or Health Care Professional?

WITNESS INFORMATION

Were There Any Witnesses?

If Yes, List Names and How to Contact Them:

ADDITIONAL COMMENTS & INFORMATION

REPORT PREPARED BY

Name:		Title:
Signature:	Date:	Phone:

REPORT ALL WORKER'S COMPENSATION INJURIES TO SHAW CLAIMS DEPARTMENT

FAX REPORT WITHIN 24 HOURS OF INCIDENT TO 225-932-2636.

INCIDENT INVESTIGATION REPORT

*** MUST BE COMPLETED WITHIN 72 HOURS ***

Investigation Date _____ Date of Incident _____

Employee Name _____

Supervisor Name _____

Project Number/Name _____ / _____

Location of Incident _____

Incident Classification

Injury:	☐ First Aid	Vehicle:	☐ Chargeable	DOT	☐ DOT Vehicle
	☐ OSHA Recordable		☐ Non-Chargeable		☐ DOT Reportable
	☐ Lost Workday				
	☐ Restricted Workday	Near Miss: ☐		General Liability ☐	

Description (Provide facts, describe how incident occurred, provide diagram [on back] or photos)

_____

_____

Analysis 1 (What unsafe acts or conditions contributed to the incident?)

_____

_____

Analysis 2 (What systematic or management deficiencies contributed to incident?)

_____

_____

Corrective Action(s) (List corrective action items, responsible person, scheduled completion date)

_____

_____

Witnesses (Attach statements or indicate why unavailable)

_____

_____

Investigated By _____ _____ _____

Print Name Signature

Project/Location Mgr. _____ _____ _____

Print Name Signature

(Attach Additional Pages if Needed)

VEHICLE ACCIDENT REPORT

Commercial Vehicles

SHAW LOCATION

SHAW SUBSIDIARY NAME | LOCATION CODE | PHONE

BUSINESS ADDRESS | CITY | STATE | ZIP

SHAW VEHICLE

VEHICLE YEAR, MAKE, MODEL | VEHICLE VIN | LICENSE PLATE NUMBER/STATE

TRAILER YEAR, MAKE, MODEL | TRAILER VIN | LICENSE PLATE NUMBER/STATE

DESCRIPTION OF DAMAGE TO VEHICLE

DATE, TIME, AND PLACE

DATE OF ACCIDENT

TIME ☐ AM ☐ PM

EXACT LOCATION OF ACCIDENT OR LOSS (include cross-streets, mile-markers, etc.)

DRIVER OF SHAW VEHICLE

DRIVER'S NAME AND ADDRESS | PHONE NUMBER

DRIVER'S LICENSE NUMBER/STATE | SEX | DATE OF BIRTH | SOCIAL SECURITY | WORK PHONE

ACCIDENT INFORMATION

DRIVER'S DESCRIPTION OF ACCIDENT

ILLUSTRATE HOW ACCIDENT OCCURRED (LABEL VEHICLES AND STREET NAMES)

WERE POLICE INVOLVED? ☐ YES ☐ NO

DEPARTMENT NAME:

CITATIONS ISSUED: ☐ YES ☐ NO

TO WHOM:

WITNESS NAME

WITNESS ADDRESS | PHONE:

ADDITIONAL COMMENTS

VEHICLE ACCIDENT REPORT

Commercial Vehicles

Page 2

OTHER (NON-SHAW) VEHICLES INVOLVED

VEHICLE 1

OWNER NAME SEX

OWNER ADDRESS, CITY, STATE, ZIP

HOME PHONE BUSINESS PHONE

DOB AGE SOCIAL SECURITY NUMBER

VEHICLE YEAR, MAKE, MODEL LICENSE PLATE/STATE

TRAILER YEAR, MAKE MODEL LICENSE PLATE/STATE

VEHICLE VIN

INSURANCE COMPANY POLICY NUMBER

OPERATOR NAME SEX

OPERATOR ADDRESS, CITY, STATE, ZIP

HOME PHONE BUSINESS PHONE

DRIVER'S LICENSE NO./STATE

DOB AGE SOCIAL SECURITY NO.

PASSENGER NAME INJURED? ☐ YES ☐ NO

PASSENGER NAME INJURED? ☐ YES ☐ NO

WAS VEHICLE PARKED?

DESCRIPTION OF DAMAGE TO VEHICLE:

ANY DAMAGE TO PROPERTY OTHER THAN VEHICLES (building, fence, sign, etc.)?

PROPERTY OWNER NAME

PROPERTY OWNER ADDRESS, CITY, STATE, ZIP

HOME PHONE: BUSINESS PHONE:

DESCRIPTION OF DAMAGE TO PROPERTY

VEHICLE 2

OWNER NAME SEX

OWNER ADDRESS, CITY, STATE, ZIP

HOME PHONE BUSINESS PHONE

DOB AGE SOCIAL SECURITY NUMBER

VEHICLE YEAR, MAKE, MODEL LICENSE PLATE/STATE

TRAILER YEAR, MAKE MODEL LICENSE PLATE/STATE

VEHICLE VIN

INSURANCE COMPANY POLICY NUMBER

OPERATOR NAME SEX

OPERATOR ADDRESS, CITY, STATE, ZIP

HOME PHONE BUSINESS PHONE

DRIVER'S LICENSE NO./STATE

DOB AGE SOCIAL SECURITY NO.

PASSENGER NAME INJURED? ☐ YES ☐ NO

PASSENGER NAME INJURED? ☐ YES ☐ NO

WAS VEHICLE PARKED?

DESCRIPTION OF DAMAGE TO VEHICLE:

ANY DAMAGE TO PROPERTY OTHER THAN VEHICLES (building, fence, sign, etc.)?

PROPERTY OWNER NAME

PROPERTY OWNER ADDRESS, CITY , STATE, ZIP

HOME PHONE: BUSINESS PHONE:

DESCRIPTION OF DAMAGE TO PROPERTY

GENERAL LIABILITY, PROPERTY DAMAGE, AND LOSS REPORT

PROJECT/LOCATION _____ PROJECT NO. _____ DATE _____

)DRESS _____

HOW DID DAMAGE OR LOSS OCCUR? _____

_____

_____

DESCRIPTION AND VALUE ($) OF DAMAGED/LOST/STOLEN PROPERTY: _____

_____

LOCATION OF DAMAGED/LOST/STOLEN PROPERTY (Before Loss): _____

_____

DATE AND TIME OF DAMAGE, LOSS, OR THEFT: Date: _____ Time: _____ a.m. / p.m.

OWNER OR DAMAGED/LOST/STOLEN PROPERTY:

Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

INJURED PARTIES (Also complete a Supervisor's Employee Injury Report if a Company Employee):

1. Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

Description of Injury _____

WITNESSES:

1. Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

2. Name _____ Phone No. (_____) _____

Address _____ City _____

Employer and Address _____

WERE PICTURES TAKEN? ☐ YES ☐ NO

WERE POLICE NOTIFIED? ☐ YES ☐ NO DEPT. _____ REPORT NO. _____

COMPLETED BY:

_____ _____ _____

(Print name) (Signature) (Date)

PROJECT/LOCATION MANAGER:

_____ _____ _____

(Print name) (Signature) (Date)

REPORT MUST BE CALLED IN OR FAXED TO:

CORPORATE CLAIMS DEPARTMENT (PHONE: 225.932.2527, FAX: 225.932.2636)

WITHIN 24 HOURS, OR NOT LATER THAN NEXT BUSINESS DAY

ACCIDENT REVIEW BOARD

DATE:	LOCATION:
BOARD MEMBERS:	
ACCIDENT DATE:	EMPLOYEE(S) INVOLVED IN INCIDENT:
INVESTIGATION COMPLETE: YES ☐ NO ☐	ACCIDENT CLASSIFICATION:

THE FOLLOWING INFORMATION MUST BE PROVIDED BY THE REVIEW BOARD FOR THIS INCIDENT (PRINT):

SUPERVISOR:_____ **PROJECT/LOCATION MGR.:** _____

CAUSE OF ACCIDENT:

ACTION BY BOARD*:

* ALL ACTIONS BY THE ACCIDENT REVIEW BOARD ARE SUBJECT TO FINAL REVIEW BY THE HUMAN RESOURCES AND LEGAL DEPARTMENTS.

ACCEPTED:	
_____ (Employee Signature)	_____ (Supervisor Signature)
APPROVED:	REJECTED FOR:
_____ (Project/Location Manager)	_____
APPROVED:	REJECTED FOR:
_____ (Business Line Health and Safety Manager or Designee)	_____
APPROVED:	REJECTED FOR:
_____ (Business Line Vice President)	_____

Employee Witness Statement

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

This form should be completed by every employee working in the crew of the injured employee and by every other employee with knowledge of events or circumstances involved in the incident.

This information is being solicited from you so that the company can accurately assess the reported incident to avoid similar occurrences in the future. Describe only the facts for which you have personal knowledge. If you have no knowledge of the incident, write "no knowledge".

Company _____

Exact Location of Incident/Accident _____

Name of Injured Employee _____

Date of Incident/Accident _____ Time _____ am pm

Date of this Statement _____ Time _____ am pm

Time your shift begins? Time _____ am pm Ends _____ am pm

Witness Information:

- Name _____
- Home Phone No. _____
- Home Address _____
- County _____ Zip _____

Witness' Supervisor Name _____

If not employed by Shaw, enter name of company _____

Company Phone Number _____

Did You See the Incident/Accident? _____

How Far From You (approx., in feet) Did the Incident/Accident Occur? _____

Stating Only Factual Information, Describe in Detail What Happened and Include Any Applicable Events Leading to the Incident/Accident.

_____

_____

_____

I certify that, to the best of my knowledge, all of the above information is complete, accurate and factual. I acknowledge that the intentional falsification or altering of facts or making misleading statements may be grounds for disciplinary action.

_____ _____

'itness Signature/Date Print Name

Injured Employee Statement

MUST BE COMPLETED WITHIN 24 HOURS OF THE INCIDENT

This form should be completed by the injured employee involved in the incident. Describe only the facts for which you have personal knowledge. If you have no knowledge of a particular question, write "no knowledge".

Company _____

Exact Location of Incident/Accident _____

Name of Injured Employee _____

Date of Incident/Accident _____ Time _____ am pm

Date of this Statement _____ Time _____ am pm

Time your shift begins? Time _____ am pm Time your shift ends? Time _____ am pm

Name of Known Witnesses:

Name _____

Name _____

Name _____

Name _____

Your Immediate Supervisors Name _____

If not employed by Shaw, enter name of company and phone number _____

ve you had a prior injury similar to this injury? _____

Was it while you were at work? _____

What date did the prior injury occur? _____

Stating Only Factual Information, Describe in Detail What Happened and Include Any Applicable Events Leading to the Incident/Accident.

_____

_____

_____

_____

I certify that, to the best of my knowledge, all of the above information is complete, accurate and factual. I acknowledge that the intentional falsification or altering of facts or making misleading statements may be grounds for disciplinary action.

_____ _____

Signature/Date Print Name

Incident Reporting and Management Procedure - Commercial & State/Local Programs

	Action	Who? *When*?	Under what circumstances?	How?	Notes:
1.	Notify Supervisor for all incidents **(no matter how minor)**	Injured person, first person recognizing incident, driver/passenger, or employee causing damage **Immediately**	**All incidents no matter how minor**	In person or by telephone	
2.	For ***life-threatening injuries/illnesses*** - contact local emergency personnel For ***non life-threatening injuries/illnesses*** - transport injured person to doctor at an occupational medical facility For ***vehicle accidents*** – make scene safe, notify police, aid injured parties For ***equipment/property damage*** - make scene safe, prevent further damage or injuries	Site Supervisor **Immediately (concurrently with next step if injury or illness)** Site Supervisor **Immediately (concurrently with next step if injury or illness)** Driver/passenger **Immediately** Employee causing damage Immediately	– In case of serious injury or illness requiring off-site medical care	– Via ambulance – – – Via vehicle	– Site Supervisor or Site Safety Officer must immediately go to emergency care facility. – – – Site Supervisor or Site Safety Officer must transport and stay with injured person until released from care
3.	Notify CORE **(for injuries/illnesses to Shaw employees only)**	Site Supervisor *Immediately, prior to transporting the injured employee, unless injuries are life threatening*	♦ Serious injury requiring off-site medical care ♦ If employee states that he/she has been exposed to any chemical or biological substance	**877347-7429** **Note: Outside Continental US call : 781-935-8581**	♦ Not required for temporary agency and contract labor ♦ Provide name of injured employee, name and phone # of treating medical facility, description of the incident ♦ CORE will help with medical facility coordination and follow-up care
4.	Notify Regional EHS Manager	Site Supervisor *Immediately (concurrently with providing transportation to occupational medical facility or EMS transport to hospital)*	All incidents	– See C&S/L Incident Notification and Communication Contact List (attached)	♦ Contact should be made prior to sending the individual for medical care ♦ Regional EHS Manager will notify Clifford Florczak as appropriate

Incident Reporting and Management Procedure – Commercial & State/Local (continued)

Action	Who? *When?*	Under what circumstances?	How?	Notes:
5. Contact Shaw Notification Hotline/Help Desk	Site Supervisor *As soon as possible. Prior to sending an individual for medical treatment*	♦ Illness and/or injury (doctors cases and above) ♦ Property damage (damage > $2,500.00) ♦ Vehicle accidents (All) ♦ Criminal activity (i.e. bomb threat, theft) ♦ Natural disaster (all) ♦ Explosion and/or fires (damage > $2,500.00 or result in injury) ♦ Environmental spills/releases (incidents that requires regulatory notification or have an offsite impact) ♦ Regulatory agency visit ♦ Fatalities	Shaw Notification Hotline/Help Desk Phone Number **866-299-3445** **Note: Outside the Continental US call** **225-215-5056**	
6. Complete forms: ***Injuries and illnesses*** ♦ Authorization for Release of Protected Medical Information ♦ Authorization for Treatment of Occupational Injury/Illness ♦ Return-To-Work Examination Form ***and*** fax to CORE ***and*** fax to Loss Prevention Manager (Casey Parker)	Injured employee and medical facility personnel (Site Supervisor is responsible for verifying forms are completed) *Prior to leaving medical facility*	♦ Serious injury requiring off-site medical care ♦ If employee states that he/she has been exposed to any chemical or biological substance	Fax to CORE at 225-292-8986 Fax to Loss Prevention Manager (Casey Parker at 225-987-3080)	Site Supervisor or Site Safety Officer must take these forms with him/her to occupational medical facility or hospital (Contained in HS 020)

	Action	Who? *When?*	Under what circumstances?	How?	Notes:
7.	Call Project Manager and notify of incident	Site Supervisor *As soon as reasonably possible*		–	Project Manager will report incident to upper levels of Operations/Business Line Management
8.	Call back Regional EHS Manager to report on status of ***injured/ill employee***	Site Supervisor *Prior to employee leaving medical facility*	All injuries and illnesses requiring off-site medical care	– See C&S/L Incident Notification and Communication Contact List (attached)	
9.	Complete forms: ***OSHA Recordable Cases*** Supervisor's Employee Injury/Illness Report Form Injured Employee Statement Witness Statement Form(s) ***First Aid Cases*** Supervisor's Employee Injury/Illness Report Injured Employee Statement Witness Statement Form(s) **Fax completed forms** to Shaw Corporate Claims and Regional EHS Manager and CORE.	♦ Site Supervisor ♦ Witnesses *As soon as possible – no later than 24 hours*	All injuries, illnesses, and first aide cases	Shaw Corporate Claims Department Fax (225-932-2636) CORE Fax 225-292-8986 See C&S/L Incident Notification and Communication Contact List (attached)	Site Supervisor should have these forms with him/her at all times (Contained in HS 020)
10.	Complete forms: ***Chargeable Vehicle Accidents*** Vehicle Accident Report Witness Statement Form(s) Driving Record Certification (Procedure HS800) ***Non-Chargeable Vehicle Accidents*** Vehicle Accident Report Witness Statement Form(s)	♦ Site Lead / Supervisor ♦ Witnesses *As soon as possible – no later than 24 hours*	All vehicle accidents and /or all property damage	Shaw Corporate Claims Department (225-932-2636) See C&S/L Incident Notification and Communication	Supervisor should have these forms with him/her at all times (Contained in HS 020)

	Equipment, Property Damage and General Liability Incidents Equipment, Property Damage and General Liability Loss Report Witness Statement Form(s) **Fax completed forms** to Shaw Corporate Claims and Regional EHS Manager.		Contact List (attached)
11.	Perform "Accident Review Board" (ARB) and fax to Regional EHS Manager.	Site Supervisor/Project Manager *Within 10 days of incident*	OSHA Recordable Cases Chargeable Vehicle Accidents	ARB must include: Regional Vice President, Project Manager, Employee's Direct Supervisor, Regional EHS Manager, and Employee(s) involved in the incident. Lost time injuries will require Jeff Jenkins and Clifford Florczak

C&S/L INCIDENT NOTIFICATION AND COMMUNICATION CONTACT LIST

Project Number: _____ Project / Office / Facility Location: _____

Note: Notifications to operations chain will be verbal and as soon as reasonably possible, but no later than 24-hours following the incident

Name	Phone Number(s)	Fax Number	E-mail
Shaw Notification Hotline / Helpdesk	866-299-3445 225-215-5056 (Outside Continental US)	N/A	N/A
CORE	877-347-7429	225-292-8986	
Shaw Corporate Claims Department		225-932-2636	
EHS Manager – Barry Conaway	609-588-6394 (office) / 609-510-1134 (cell)	609-689-7771	barry.conaway@shawgrp.com
EHS Manager – Rob Elfrink	314-436-7390 ext. 225 (office) / 314-220-7980 (cell)	314-436-8587	rob.elfrink@shawgrp.com
EHS Manager – Greg McElroy	412-858-1542 (office) / 412-759-5302 (cell)	419-425-6039	greg.mcelroy@shawgrp.com
CSL EHS Director, Central & NE– Clifford Florczak	312-499-3503 (office-Chicago) 708-260-1266 (office) 708-308-6200 (cell)	312-499-3505	clifford.florczak@shawgrp.com.
CSL West/ Federal ERC EHS Director – Dave Mummert	419-425-6129 (office) / 419-348-1544 (cell)	419-425-6039	dave.mummert@shawgrp.com
CSL Gulf/Southeast Federal Infrastructure EHS Director – Andrew Johnson	513-782-4972 (office) / 859-393-4346 (cell)	N/A	andrew.johnson@shawgrp.com
Loss Prevention Manager - Casey Parker	225-932-2763 (office) / 225-405-1246 (cell)	225-987-3080	casey.parker@shawgrp.com
Shaw E&I Health & Safety Director - Troy Allen	225-932-2579 (office) / 225-229-1759 (cell)	225-987-3454	troy.allen@shawgrp.com
Project/Office Manager			
District/Business Line Manager (s) August Arrigo Tim Kemper	 631-472-4000 ext 223 (office) / 516-650-4836 (cell) 508-497-6162 (office) / 617-515-3004 (cell)	 631-472-4077 508-435-9641	 august.arrigo@shawgrp.com tim.kemper@shawgrp.com
Vice President, Commercial Construction - John Wilpert	609-588-6302 (office)	609-588-6399	john.wilpert@shawgrp.com
Central /NE Regional Vice President - Thomas Donovan	312-499-3510 (office)		thomas.donovan@shawgrp.com

Appendix C

Job Safety Analyses (JSAs)

JOB SAFETY ANALYSIS

SUPERVISION/FOREMAN
Consider the following and check the items which apply to the job, then review with the work crew.

PERMITS
- ☐ Required
- ☐ Cold Work
- ☐ Hot Work
- ☐ Entry Permit
- ☐ All Conditions Met
- ☐ Signed Off When Complete
- ☐ Other

PERSONAL PROTECTIVE EQUIP. (PPE)
- ☐ Type of Gloves
- ☐ Composition of Gloves
- ☐ Special Purpose Gloves
- ☐ Tyvek Suit
- ☐ Acid Suit /Slicker Suit
- ☐ Rubber Boots
- ☐ Mono Goggles (vented/non-vented)
- ☐ Face Shield
- ☐ Respirator
- ☐ Fresh Air
- ☐ Ear Protection
- ☐ Safety Harness
- ☐ Burning Goggles
- ☐ Other

TOOLS
- ☐ Current Inspection
- ☐ Proper Tools for the Job
- ☐ Good Tool Condition
- ☐ Qualifications
- ☐ Other

EMERGENCY EQUIPMENT
- ☐ Fire Extinguishers
- ☐ Safety Shower
- ☐ Evacuation Route
- ☐ Other

WELDING
- ☐ Flashburns
- ☐ Combustibles
- ☐ Spark Containment
- ☐ Shields
- ☐ Grounding
- ☐ Water Hose
- ☐ Fire Extinguisher
- ☐ Fire Blanket
- ☐ Fire Watch
- ☐ Sewer Covers
- ☐ Other

OVERHEAD WORK
- ☐ Barricades
- ☐ Signs
- ☐ Hole Cover
- ☐ Handrail
- ☐ Other

ELECTRICAL
- ☐ Locked & Tagged out
- ☐ Try Start/Stop Switch
- ☐ GFCI Test
- ☐ Assured Grounding
- ☐ Extension Cord Inspection
- ☐

LIFTING
- ☐ Forklift
- ☐ Cherry Picker
- ☐ Load Chart
- ☐ Angle
- ☐ Crane
- ☐ Chainfall
- ☐ Proper Rigging Practices
- ☐ Manual Lifting
- ☐ Condition of Equipment
- ☐ Operator Certificate

HAZARDS (ENVIRONMENTAL)
- ☐ Electrical Shock
- ☐ Heat Stress
- ☐ Heavy Objects
- ☐ Hot/Cold Surf. Or Mat.
- ☐ Inadequate Lighting
- ☐ Line Breaking
- ☐ Noise
- ☐ Poor Access/Egress
- ☐ Sharp Objects
- ☐ Other

HAZARDS/CHEMICALS
- ☐ Chemical Burn Shin/Eyes
- ☐ Flammable
- ☐ Ingestion
- ☐ Inhalation
- ☐ Skin Contamination

HAZARDS/BODY
- ☐ Fall Potential
- ☐ Pinch Points
- ☐ Slip-Trip Potential
- ☐ Other

OTHER WORK IN AREA
- ☐ Others Working Overhead
- ☐ Type Work Others Doing
- ☐ PPE Due to Other Work
- ☐ Other

ACCESS
- ☐ Scaffold (properly inspected)
- ☐ Ladder (Tied off)
- ☐ Manlift
- ☐ Personnel Basket (inspected & approved)
- ☐ Operator Training
- ☐ Special Provisions
- ☐ Other

Confined Space
Know the Following:
1) Possible hazards within the confined space
2) First signs of exposure
3) How to summons help
4) How to track personnel
5) Entering and exiting the confined space
6) Maintain contact with all entrants by voice or visual
7) Do not attempt to rescue unless you are a part of a coordinated effort
8) Remain at entry point assume no duties with take you from there.

JOB SAFETY ANALYSIS

Location of Job (Unit/Location on Project):		
Required PPE:	**Safety Access/ Location**	Supervisor of Work:
	Safe Haven:	JSA Prepared By:
	Wind Direction:	Are other crews in area?
Pre-Job Preparation Fill out JSA Review JSA (EVERYONE) Sign JSA (EVERYONE)	Evacuation Route: Assembly Point:	New: / Revised:

Job Task (What are You Doing)	**Audit the Job** Audit Time:
Potential Hazards	**Supervisors Comments**
Recommended Action or Procedure	**Supervisor's Initials:**

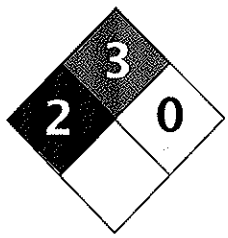
Crew Name Signatures:		

For JSA Forms, Please Refer To:

http://shawnet3.shawgrp.com/sites/eihs/Activity%20Hazard%20Analysis/Forms/AllItems.aspx

Appendix D
MSDS Definitions, Material Safety Data Sheets (MSDS)

ScienceLab.com
Chemicals & Laboratory Equipment



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Benzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Benzene

Catalog Codes: SLB1564, SLB3055, SLB2881

CAS#: 71-43-2

RTECS: CY1400000

TSCA: TSCA 8(b) inventory: Benzene

CI#: Not available.

Synonym: Benzol; Benzine

Chemical Name: Benzene

emical Formula: C6-H6

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

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
Benzene	71-43-2	100

Toxicological Data on Ingredients: Benzene: ORAL (LD50): Acute: 930 mg/kg [Rat]. 4700 mg/kg [Mouse]. DERMAL (LD50): Acute: >9400 mg/kg [Rabbit]. VAPOR (LC50): Acute: 10000 ppm 7 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of eye contact (irritant), of inhalation. Hazardous in case of skin contact (irritant, permeator), of ingestion. Inflammation of the eye is characterized by redness, watering, and itching.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC.
MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE].
The substance is toxic to blood, bone marrow, central nervous system (CNS).
The substance may be toxic to liver, Urinary System.
peated 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 immediately.

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 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. 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: 497.78°C (928°F)

Flash Points: CLOSED CUP: -11.1°C (12°F). (Setaflash)

Flammable Limits: LOWER: 1.2% UPPER: 7.8%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat.
Slightly flammable to flammable in presence of oxidizing materials.
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.
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:
Extremely flammable liquid and vapor. Vapor may cause flash fire.
Reacts on contact with iodine heptafluoride gas.

Dioxygenyl tetrafluoroborate is as very powferful oxidant. The addition of a small particle to small samples of benzene, at ambient temperature, causes ignition.
Contact with sodium peroxide with benzene causes ignition.
Benzene ignites in contact with powdered chromic anhydride.
Vigorous or incandescent reaction with hydrogen + Raney nickel (above 210 C) and bromine trifluoride.

Special Remarks on Explosion Hazards:
Benzene vapors + chlorine and light causes explosion.
Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate.
Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion.
Interaction of nitryl perchlorate with benzene gave a slight explosion and flash.
The solution of permanganic acid (or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene.
Peroxodisulfuric acid is a very powferful oxidant. Uncontrolled contact with benzene may cause explosion.
Mixtures of peroxomonsulfuric acid with benzene explodes.

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. 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. 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: 0.5 STEL: 2.5 (ppm) from ACGIH (TLV) [United States]
TWA: 1.6 STEL: 8 (mg/m3) from ACGIH (TLV) [United States]
TWA: 0.1 STEL: 1 from NIOSH
A: 1 STEL: 5 (ppm) from OSHA (PEL) [United States]
WA: 10 (ppm) from OSHA (PEL) [United States]
TWA: 3 (ppm) [United Kingdom (UK)]
TWA: 1.6 (mg/m3) [United Kingdom (UK)]
TWA: 1 (ppm) [Canada]
TWA: 3.2 (mg/m3) [Canada]
TWA: 0.5 (ppm) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor:
Aromatic. Gasoline-like, rather pleasant.
(Strong.)

Taste: Not available.

Molecular Weight: 78.11 g/mole

Color: Clear Colorless. Colorless to light yellow.

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

Boiling Point: 80.1 (176.2°F)

Melting Point: 5.5°C (41.9°F)

tical Temperature: 288.9°C (552°F)

Specific Gravity: 0.8787 @ 15 C (Water = 1)

Vapor Pressure: 10 kPa (@ 20°C)

Vapor Density: 2.8 (Air = 1)

Volatility: Not available.

Odor Threshold: 4.68 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 2.1

Ionicity (in Water): Not available.

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

Solubility:
Miscible in alcohol, chloroform, carbon disulfide oils, carbon tetrachloride, glacial acetic acid, diethyl ether, acetone.
Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

tability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles.

Incompatibility with various substances: Highly reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Benzene vapors + chlorine and light causes explosion.
Reacts explosively with bromine pentafluoride, chlorine, chlorine trifluoride, diborane, nitric acid, nitryl perchlorate, liquid oxygen, ozone, silver perchlorate.
Benzene + pentafluoride and methoxide (from arsenic pentafluoride and potassium methoxide) in trichlorotrifluoroethane causes explosion.
Interaction of nitryl perchlorate with benzene gave a slight explosion and flash.
The solution of permanganic acid (or its explosive anhydride, dimaganese heptoxide) produced by interaction of permanganates and sulfuric acid will explode on contact with benzene.
Peroxodisulfuric acid is a very powerful oxidant. Uncontrolled contact with benzene may cause explosion.
Mixtures of peroxomonsulfuric acid with benzene explodes.

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): 930 mg/kg [Rat].
Acute dermal toxicity (LD50): >9400 mg/kg [Rabbit].
Acute toxicity of the vapor (LC50): 10000 7 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC.
MUTAGENIC EFFECTS: Classified POSSIBLE for human. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female [POSSIBLE].
Causes damage to the following organs: blood, bone marrow, central nervous system (CNS).
May cause damage to the following organs: liver, Urinary System.

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (female fertility, Embryotoxic and/or foetotoxic in animal) and birth defects.
May affect genetic material (mutagenic).
May cause cancer (tumorigenic, leukemia))
Human: passes the placental barrier, detected in maternal milk.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes skin irritation. It can be absorbed through intact skin and affect the liver, blood, metabolism,and urinary system.
Eyes: Causes eye irritation.
Inhalation: Causes respiratory tract and mucous membrane irritation. Can be absorbed through the lungs. May affect behavior/Central and Peripheral nervous systems (somnolence, muscle weakness, general anesthetic, and

other symptoms similar to ingestion), gastrointestinal tract (nausea), blood metabolism, urinary system.
Ingestion: May be harmful if swallowed. May cause gastrointestinal tract irritation including vomiting. May affect behavior/Central and Peripheral nervous systems (convulsions, seizures, tremor, irritability, initial CNS stimulation followed by depression, loss of coordination, dizziness, headache, weakness, pallor, flushing), respiration (breathlessness and chest constriction), cardiovascular system, (shallow/rapid pulse), and blood.

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

T Classification: CLASS 3: Flammable liquid.

Identification: : Benzene UNNA: 1114 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: Benzene
California prop. 65 (no significant risk level): Benzene: 0.007 mg/day (value)
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
Connecticut carcinogen reporting list.: Benzene
Connecticut hazardous material survey.: Benzene
Illinois toxic substances disclosure to employee act: Benzene
Illinois chemical safety act: Benzene
New York release reporting list: Benzene
Rhode Island RTK hazardous substances: Benzene
Pennsylvania RTK: Benzene
Minnesota: Benzene
Michigan critical material: Benzene
Massachusetts RTK: Benzene
Massachusetts spill list: Benzene
New Jersey: Benzene
New Jersey spill list: Benzene
Louisiana spill reporting: Benzene
California Director's list of Hazardous Substances: Benzene

TSCA 8(b) inventory: Benzene
SARA 313 toxic chemical notification and release reporting: Benzene
CERCLA: Hazardous substances.: Benzene: 10 lbs. (4.536 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.
R22- Harmful if swallowed.
R38- Irritating to skin.
R41- Risk of serious damage to eyes.
R45- May cause cancer.
R62- Possible risk of impaired fertility.
S2- Keep out of the reach of children.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S39- Wear eye/face protection.
S46- If swallowed, seek medical advice immediately and show this container or label.
S53- Avoid exposure - obtain special instructions before use.

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.

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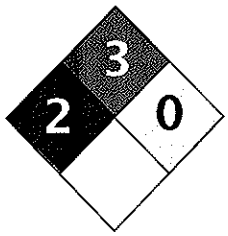

Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Ethylbenzene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylbenzene

Catalog Codes: SLE2044

CAS#: 100-41-4

RTECS: DA0700000

TSCA: TSCA 8(b) inventory: Ethylbenzene

CI#: Not available.

Synonym: Ethyl Benzene; Ethylbenzol; Phenylethane

Chemical Name: Ethylbenzene

Chemical Formula: C8H10

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

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
Ethylbenzene	100-41-4	100

Toxicological Data on Ingredients: Ethylbenzene: ORAL (LD50): Acute: 3500 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant, sensitizer).
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.
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. 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:
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. 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: 432°C (809.6°F)

Flash Points:
CLOSED CUP: 15°C (59°F). (Tagliabue.) OPEN CUP: 26.667°C (80°F) (Cleveland) (CHRIS, 2001)
CLOSED CUP: 12.8 C (55 F) (Bingham et al, 2001; NIOSH, 2001)
CLOSED CUP: 21 C (70 F) (NFPA)

Flammable Limits: LOWER: 0.8% - 1.6%UPPER: 6.7% - 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

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.
Slightly explosive in presence of heat.

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. Vapors may form explosive mixtures with air. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Vapors may form explosive mixtures in air.

Section 6: Accidental Release Measures

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

rge Spill:
.mmable 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 away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. 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:
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). Sensitive to light. Store in light-resistant containers.

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.

sonal 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: 125 (ppm) from OSHA (PEL) [United States]
TWA: 435 STEL: 545 from OSHA (PEL) [United States]
TWA: 435 STEL: 545 (mg/m3) from NIOSH [United States]
TWA: 100 STEL: 125 (ppm) from NIOSH [United States]
TWA: 100 STEL: 125 (ppm) from ACGIH (TLV) [United States]
TWA: 100 STEL: 125 (ppm) [United Kingdom (UK)]
TWA: 100 STEL: 125 (ppm) [Belgium]
TWA: 100 STEL: 125 (ppm) [Finland]
TWA: 50 (ppm) [Norway]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish. Gasoline-like. Aromatic.

ste: Not available.

Molecular Weight: 106.16 g/mole

Color: Colorless.

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

Boiling Point: 136°C (276.8°F)

Melting Point: -94.9 (-138.8°F)

Critical Temperature: 617.15°C (1142.9°F)

Specific Gravity: 0.867 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.66 (Air = 1)

Volatility: 100% (v/v).

Odor Threshold: 140 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in diethyl ether.
Very slightly soluble in cold water or practically insoluble in water.
Soluble in all proportions in Ethyl alcohol.
Soluble in Carbon tetrachloride, Benzene.
Insoluble in Ammonia.
Slightly soluble in Chloroform.
Solubility in Water: 169 mg/l @ 25 deg. C.; 0.014 g/100 ml @ 15 deg. C.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ingnition sources (flames, sparks, static), incompatible materials, light

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials.
Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation.

Toxicity to Animals: Acute oral toxicity (LD50): 3500 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.
May cause damage to the following organs: central nervous system (CNS).

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

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc 50% Kill:
LD50 [Rabbit] - Route: Skin; Dose: 17800 ul/kg
Lowest Published Lethal Dose/Conc:
LDL[Rat] - Route: Inhalation (vapor); Dose: 4000 ppm/4 H

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects (teratogenic) based on animal test data.
May cause cancer based on animals data. IARC evidence for carcinogenicity in animals is sufficient. IARC evidence of carcinogenicity in humans inadequate.
May affect genetic material (mutagenic).

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Can cause mild skin irritation. It can be absorbed through intact skin.
Eyes: Contact with vapor or liquid can cause severe eye irritation depending on concentration. It may also cause conjunctivitis. At a vapor exposure level of 85 - 200 ppm , it is mildly and transiently irritating to the eyes; 1000 ppm causes further irritation and tearing; 2000 ppm results in immediate and severe irritation and tearing; 5,000 ppm is intolerable (ACGIH, 1991; Clayton and Clayton, 1994). Standard draize test for eye irritation using 500 mg resulted in severe irritation (RTECS)
Inhalation: Exposure to high concentrations can cause nasal, mucous membrane and respiratory tract irritation and can also result in chest constriction and, trouble breathing, respiratory failure, and even death. It can also affect behavior/Central Nervous System. The effective dose for CNS depression in experimental animals was 10,000 ppm (ACGIH, 1991). Symptoms of CNS depression include headache, nausea, weakness, dizziness, vertigo, irritability, fatigue, lightheadedness, sleepiness, tremor, loss of coordination, judgement and conciousness, coma, and death. It can also cause pulmonary edema. Inhalation of 85 ppm can produce fatigue, insomnia, headache, and mild irritation of the respiratory tract (Haley & Berndt, 1987).
Ingestion: Do not drink, pipet or siphon by mouth. May cause gastroinestinal/digestive tract irritation with Abdominal pain, nausea, vomiting. Ethylbenzene is a pulmonary aspiration hazard. Pulmonary aspiration of even small amounts of the liquid may cause fatal pneumonitis. It may also affect behavior/central nervous system with

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 14 mg/l 96 hours [Fish (Trout)] (static). 12.1 mg/l 96 hours [Fish (Fathead Minnow)] (flow-through)]. 150 mg/l 96 hours [Fish (Blue Gill/Sunfish)] (static). 275 mg/l 96 hours [Fish (Sheepshead Minnow)]. 42.3 mg/l 96 hours [Fish (Fathead Minnow)](soft water). 87.6mg/l 96 hours [Shrimp].

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:
ste 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: : Ethylbenzene UNNA: 1175 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ethylbenzene
Illinois toxic substances disclosure to employee act: Ethylbenzene
Illinois chemical safety act: Ethylbenzene
New York release reporting list: Ethylbenzene
Rhode Island RTK hazardous substances: Ethylbenzene
Pennsylvania RTK: Ethylbenzene
Minnesota: Ethylbenzene
Massachusetts RTK: Ethylbenzene
Massachusetts spill list: Ethylbenzene
New Jersey: Ethylbenzene
New Jersey spill list: Ethylbenzene
Louisiana spill reporting: Ethylbenzene
ifornia Director's List of Hazardous Substances: Ethylbenzene
CA 8(b) inventory: Ethylbenzene
TSCA 4(a) proposed test rules: Ethylbenzene
TSCA 8(d) H and S data reporting: Ethylbenzene: Effective Date: 6/19/87; Sunset Date: 6/19/97
SARA 313 toxic chemical notification and release reporting: Ethylbenzene

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).
CLASSE D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable.
R20- Harmful by inhalation.
S16- Keep away from sources of ignition - No smoking.
S24/25- Avoid contact with skin and eyes.
S29- Do not empty into drains.

HMIS (U.S.A.):

Health Hazard: 2

re 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:
-Manufacturer's Material Safety Data Sheet.
-Fire Protection Guide to Hazardous Materials, 13th ed., National Fire Protection Association (NFPA)
-Registry of Toxic Effects of Chemical Substances (RTECS)
-Chemical Hazard Response Information System (CHRIS)
-Hazardous Substance Data Bank (HSDB)
-New Jersey Hazardous Substance Fact Sheet
-Ariel Global View
-Reprotext System

Other Special Considerations: Not available.

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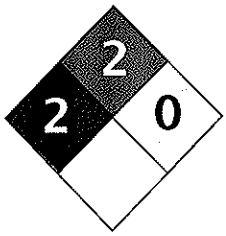

Health	2
Fire	2
Reactivity	0
Personal Protection	E

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: C10H8

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

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, CO2).

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.

rge Spill:
.mmable 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.

sonal 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)
TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [1995]
TWA: 52 STEL: 79 (mg/m3) 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.

... (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:
HA: 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.

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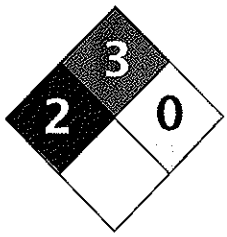


Health	2
Fire	3
Reactivity	0
Personal Protection	H

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

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, CO2).

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_2O_4; $AgClO_4$; BrF_3; 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

gineering Controls:
rovide 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/m3) 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.

ste: 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(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: Cauess mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abraisons. 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, Hypophostatemia), 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 se 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.
S3- 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

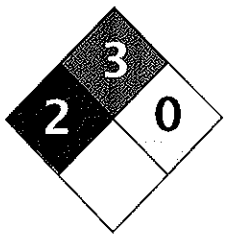
References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:30 PM

Last Updated: 11/06/2008 12:00 PM

ScienceLab.com
Chemicals & Laboratory Equipment



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Xylenes MSDS

Section 1: Chemical Product and Company Identification

Product Name: Xylenes

Catalog Codes: SLX1075, SLX1129, SLX1042, SLX1096

CAS#: 1330-20-7

RTECS: ZE2100000

TSCA: TSCA 8(b) inventory: Xylenes

CI#: Not available.

Synonym: Xylenes; Dimethylbenzene; xylol; methyltoluene

Chemical Name: Xylenes (o-, m-, p- isomers)

emical Formula: C6H4(CH3)2

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

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
Xylenes	1330-20-7	100

Toxicological Data on Ingredients: Xylenes: ORAL (LD50): Acute: 4300 mg/kg [Rat]. 2119 mg/kg [Mouse]. DERMAL (LD50): Acute: >1700 mg/kg [Rabbit].

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: 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, mucous membranes, bone marrow, 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 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: 464°C (867.2°F)

Flash Points: CLOSED CUP: 24°C (75.2°F). (Tagliabue.) OPEN CUP: 37.8°C (100°F).

Flammable Limits: LOWER: 1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

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

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: Vapors may travel to source of ignition and flash back.

Special Remarks on Explosion Hazards:
Vapors may form explosive mixtures with air.
Containers may explode when heated.

May polymerize explosively when heated.
An attempt to chlorinate xylene with 1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione (dichlorohydrantoin) caused a violent explosion

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. 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, 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: 100 (ppm) [Canada]
TWA: 435 (mg/m3) [Canada]
TWA: 434 STEL: 651 (mg/m3) from ACGIH (TLV) [United States]
TWA: 100 STEL: 150 (ppm) from ACGIH (TLV) [United States]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Sweetish.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless. Clear

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

Boiling Point: 138.5°C (281.3°F)

Melting Point: -47.4°C (-53.3°F)

Critical Temperature: Not available.

Specific Gravity: 0.864 (Water = 1)

Vapor Pressure: 0.9 kPa (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 1 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.1

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Soluble in cold water, hot water.
Miscible with absolute alcohol, ether, and many other organic liquids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatibles

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Store away from acetic acid, nitric acid, chlorine, bromine, and fluorine.

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): 2119 mg/kg [Mouse].

Acute dermal toxicity (LD50): >1700 mg/kg [Rabbit].
Acute toxicity of the vapor (LC50): 5000 4 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.
May cause damage to the following organs: blood, kidneys, liver, mucous membranes, bone marrow, 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:
Lowest Lethal Dose:
LDL [Human] - Route: Oral; Dose: 50 mg/kg
LCL [Man] - Route: Oral; Dose: 10000 ppm/6H

Special Remarks on Chronic Effects on Humans:
Detected in maternal milk in human. Passes through the placental barrier in animal. Embryotoxic and/or foetotoxic in animal.
May cause adverse reproductive effects (male and femael fertility (spontaneous abortion and fetotoxicity)) and birth defects based animal data.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Causes skin irritation. Can be absorbed through skin.
Eyes: Causes eye irritation.
Inhalation: Vapor causes respiratory tract and mucous membrane irritation. May affect central nervous system and behavior (General anesthetic/CNS depressant with effects including headache, weakness, memory loss, irritability, dizziness, giddiness, loss of coordination and judgement, respiratory depression/arrest or difficulty breathing, loss of appetite, nausea, vomiting, shivering, and possible coma and death). May also affects blood, sense organs, liver, and peripheral nerves.
Ingestion: May cause gastrointestinal irritation including abdominal pain, vomiting, and nausea. May also affect liver and urinary system/kidneys. May cause effects similar to those of acute inhalation.
Chronic Potential Health Effects:
Chronic inhalation may affect the urinary system (kidneys) blood (anemia), bone marrow (hyperplasia of bone marrow) brain/behavior/Central Nervous system. Chronic inhalation may alsocause mucosal bleeding.
Chronic ingestion may affect the liver and metabolism (loss of appetite) and may affect urinary system (kidney damage)

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: : Xylenes UNNA: 1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Xylenes
Illinois chemical safety act: Xylenes
New York acutely hazardous substances: Xylenes
Rhode Island RTK hazardous substances: Xylenes
Pennsylvania RTK: Xylenes
Minnesota: Xylenes
Michigan critical material: Xylenes
Massachusetts RTK: Xylenes
Massachusetts spill list: Xylenes
New Jersey: Xylenes
New Jersey spill list: Xylenes
Louisiana spill reporting: Xylenes
California Director's List of Hazardous Substances: Xylenes
TSCA 8(b) inventory: Xylenes
SARA 302/304/311/312 hazardous chemicals: Xylenes
SARA 313 toxic chemical notification and release reporting: Xylenes
CERCLA: Hazardous substances.: Xylenes: 100 lbs. (45.36 kg)

Other Regulations:
`HA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
..NECS: 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):
R10- Flammable.
R21- Harmful in contact with skin.
R36/38- Irritating to eyes and skin.
S2- Keep out of the reach of children.
S36/37- Wear suitable protective clothing and
gloves.
S46- If swallowed, seek medical advice
immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

tional 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: 10/11/2005 12:54 PM

Last Updated: 11/06/2008 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

This document has been prepared to comply with OSHA"s Hazard Communication Standard, 29 CFR 1910.1200

45 N.E. Loop 410, Suite 700
San Antonio, Texas 78216
Phone: (210) 349-4069
FAX: (210) 349-8512
E-mail: info@BORAL.com

Boral Material Technologies

BORAL™

Classification: Calcium Aluminum Silicate

IDENTITY: (As used on label and list)	**Emergency Telephone Number:**
Boral Class F Fly Ash	1 (800) 424-9300 (CHEMTREC)

SECTION I – Identity Information

Chemical Name:	**Telephone Number for Information:**
Fly Ash	(210) 349-4069
Chemical Family: Coal Ash	**Date Prepared:** 15-Feb-93
CAS #: 68131-74-8	**Date Revised:** 21-September-07

SECTION II – Product Composition & Information on Ingredients

Ingredients	**CAS#**	**% Weight**	**Exposure Limits**	
			OSHA PEL mg/m^3	**ACGIH TLV** mg/m^3
Calcium Aluminate Silicates	Various	>80%	15	10
Crystalline Silica	14808-60-7	Varies	[10/(%SiO_2+2)] (R) [30/(%SiO_2+2] (T)	0.05
Iron Compounds	Various	Varies	Not Available	Not Available

The above chemistries are provided for industrial hygiene and environmental purposes and are not intended to represent product pecifications. Composition is variable depending on coal source and power plant characteristics. This data has been compiled rom data believed to be reliable. Elements such as aluminum, arsenic, boron, calcium, chromium, cobalt, copper, gold, lead, molybdenum, nickel, silver, tin, titanium, vanadium, and zirconium may be present in trace amounts.

SECTION III – Physical/Chemical Characteristics

Boiling Point (°F) Not Applicable	**Specific Gravity (H_2O=1)** Not Applicable	**NFPA Health** 1
Vapor Pressure (mm Hg.) Not Applicable	**Percent Volatile by Mass (%)** Not Applicable	**NFPA Flammability** 0
Vapor Density (AIR=1) Not Applicable	**Evaporation Rate (Butyl Acetate=1)** Not Applicable	**NFPA Reactivity** 0
Solubility in Water Not Applicable	**pH** 4-12 (1%w/w)	**NFPA Special:**

Appearance and Odor
Grayish powder, odorless

SECTION IV – Fire and Explosion Hazard Data

Flash Point	**LEL**	**UEL**
Not Applicable	Not Applicable	Not Applicable

Extinguishing Media
Not Applicable

Special Fire Fighting Procedures
Not Applicable

Unusual Fire and Explosion Hazards
Not Applicable

SECTION V – Reactivity Data

Materials as shipped are not reactive

SECTION V I – Health Hazard Data

ACUTE EFFECTS OF OVEREXPOSURE:

Eye: May cause irritation by abrasion with dust.

Skin: Dust may cause irritation in hypersensitive individuals.

Inhalation: Dust may cause congestion and irritation in nasal and respiratory passages.

Ingestion: No known acute effects.

CHRONIC EFFECTS OF OVEREXPOSURE:
Excessive exposures to respirable particulate (dust) over an extended period of time may result in the development of pulmonary diseases such as silicosis

CARCINOGENICITY:
The following carcinogenicity classifications for crystalline silica have been established by the following agencies:

OSHA: Not regulated as a carcinogen

IARC: Group 1 carcinogenic in humans

NIOSH: Carcinogen, with no further categorization

NTP: Known Carcinogen

Material may contain crystalline silica, a chemical that has been determined by the agencies listed above to cause cancer and other chemicals known to cause cancer, birth defects and other reproductive harm. Inhalation of dust above established or recommended exposure levels should be avoided by use of proper ventilation and/or use of NIOSH approved respirator

SECTION V II – Precautions for Safe Handling

VENTILATION: Provide adequate ventilation to maintain exposures below the OSHA PEL and ACGIH TLV for crystalline silica and other substances.

RESPIRATORY PROTECTION: None required under PEL. IF PEL is exceeded, use a NIOSH approved half or full-face air purifying respirator with high efficiency particulate air filters.

PROTECTIVE GLOVES: Work gloves as needed

EYE PROTECTION: Recommend Safety goggles or safety glasses. Eye wash stations should be readily accessible.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: As Needed

Steps to be taken in case Material is Released or Spilled:
Clean up for use or disposal. Dampen with water mist to control dust (airborne dust) before removal. Do not use compressed air. If loaded on trucks, wet down material to prevent dusting during transport. Observe local, state, and federal regulations pertinent to reporting requirements.

Waste Disposal Method:
Dispose of in landfill or coal ash disposal pond. Observe local, state and federal regulations. This material in not RCRA hazardous waste.

Precautions to Be Taken in Handling and Storing:
Store in dry conditions. Minimize dust. Avoid creating dust.

SECTION VIII – First Aid and Medical

Skin: Wash with soap and water. If an allergic reaction causes a rash that does not heal within a few days, consult a physician.

Eyes: Flush with running water. Obtain medical assistance if irritation continues.

Ingestion: Do not induce vomiting. See a physician.

Inhalation: Remove from exposure to airborne particulates.

Medical Conditions Aggravated by Exposure:
Excessive dust exposure may aggravate any existing respiratory disorders or diseases. Possible complications or allergies resulting in irritation to skin, eyes, and respiratory tract may occur from excessive exposure to dusts.

Section IX – Other Regulations

RCRA: This material is not an RCRA hazardous waste.
EPCRA Section 311/312: Material as shipped is subject to Section 311/312 reporting.
EPCRA Section 313: Material as shipped is not subject to Section 313, Toxic Chemical Release Inventory reporting requirements.
DOT: Material as shipped is not a hazardous material as per DOT regulations.
UN/NA Code: None
Placard Required: None
Labeling Requirement: None
The information and recommendations set forth herein are based on data we have in our possession and we have reason to believe is accurate. It is, however, the user's responsibility to determine the safety, toxicity, and suitability for his/her own use of the herein described product. Because the actions by others is beyond our control, Boral Material Technologies Inc. makes no warranty expressed or implied regarding accuracy of the data or the results to be obtained from the use thereof.

CITGO No. 2 Fuel Oil, All Grades

Material Safety Data Sheet

CITGO Petroleum Corporation
P.O. Box 4689
Houston, TX 77210

MSDS No. AG2FO
Revision Date 12/31/2007

IMPORTANT: This MSDS is prepared in accordance with 29 CFR 1910.1200. Read this MSDS before transporting, handling, storing or disposing of this product and forward this information to employees, customers and users of this product.

Hazard Rankings

	HMIS	NFPA
Health Hazard	* 2	0
Fire Hazard	2	2
Reactivity	0	0

* = Chronic Health Hazard

Protective Equipment

Minimum Recommended
See Section 8 for Details

Emergency Overview

Physical State Liquid.
Color Red. **Odor** Characteristic, Kerosene-like.

WARNING!
Combustible liquid and vapor. - Can cause flash fire.
Harmful or fatal if swallowed - can enter lungs and cause damage.
Can cause eye, skin or respiratory tract irritation.
May be harmful if inhaled or absorbed through the skin.
Overexposure can cause central nervous system (CNS) depression and/or other target organ effects.
Possible Cancer Hazard (See Section 3)
Harmful to aquatic organisms.

SECTION 1. PRODUCT IDENTIFICATION

Trade Name	CITGO No. 2 Fuel Oil, All Grades	**Technical Contact**	(832) 486-5940
Product Number	Various	**Medical Emergency**	(832) 486-4700
CAS Number	68476-30-2	**CHEMTREC Emergency (United States Only)**	(800) 424-9300
Product Family	Fuels.		
Synonyms	Heating Oil; Home Heating Oil; Furnace Oil; Burner Fuel; Fuel Oil No. 2; No. 2 Heating Oil; K-2 Fuel Oil; Grade 2 Distilate Fuel; High Sulfur Fuel Oil; C9-C25 Petroleum Hydrocarbons		

SECTION 2. COMPOSITION

This product may be composed, in whole or in part, of any of the following refinery streams:

Fuel Oil, No. 2 [CAS No.: 68476-30-2]
Hydrodesulfurized Middle Distillate (petroleum) [CAS No.: 64742-80-9]
Straight-run middle distillate (petroleum) [CAS No.: 64741-44-2]
Hydrodesulfurized Light Catalytic Cracked Distillate (Petroleum) [CAS No.: 68333-25-5]
Kerosene [CAS No.: 8008-20-6]
Hydrodesulfurized Kerosine (Petroleum) [CAS No.: 64742-81-0]
Light catalytic cracked distillate (petroleum) [CAS No.: 64741-59-9]

This product contains the following chemical components:

mponent Name(s)	CAS Registry No.	Concentration (%)

Nonane, all isomers	Mixture	1 - 10
Trimethylbenzenes, all isomers	25551-13-7	0 - 2
·phthalene	91-20-3	0 - 2
·mene	98-82-8	0 - 1
Ethylbenzene	100-41-4	0 - 1

SECTION 3. HAZARDS IDENTIFICATION

Also see Emergency Overview and Hazard Ratings on the top of Page 1 of this MSDS.

Major Route(s) of Entry Skin contact. Inhalation.

Signs and Symptoms of Acute Exposure

Inhalation

Breathing high concentrations may be harmful. Mist or vapor can irritate the throat and lungs. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness.

Eye Contact

This material can cause eye irritation with tearing, redness, or a stinging or burning feeling. Further, it can cause swelling of the eyes with blurred vision. Effects may become more serious with repeated or prolonged contact.

Skin Contact

This material can cause skin irritation. Symptoms include redness, itching, and burning of the skin. This material can be absorbed by the skin and produce central nervous system depression (headache, nausea, fatigue and/or other symptoms including unconsciousness). If the skin is damaged, absorption increases. Prolonged and/or repeated contact may cause severe dermatitis and/or more serious skin disorders. Chronic symptoms may include drying, swelling, scaling, blistering, cracking, and/or severe tissue damage.

Ingestion

If swallowed, this material may irritate the mouth, throat, and esophagus. It can be absorbed into the blood stream through the stomach and intestinal tract. Symptoms may include a burning sensation of the mouth and esophagus, nausea and vomiting. In addition, it can cause central nervous system effects characterized by dizziness, staggering, drowsiness, delirium and/or loss of consciousness.

Because of the low viscosity, this material can enter the lungs directly by aspiration during swallowing or subsequent vomiting. Aspiration of a small amount of liquid can cause severe lung damage and/or death.

Chronic Health Effects Summary

Secondary effects of ingestion and subsequent aspiration into the lungs may cause pneumatocele (lung cavity) formation and chronic lung dysfunction.

This product contains petroleum middle distillates similar to those shown to produce skin tumors on laboratory rodents following repeated application. All tumors appeared during the latter portion of the typical 2-year lifespan of the animals. Certain studies have shown that washing the exposed skin of the test animal with soap and water between treatments greatly reduces the potential tumorigenic effects. These data suggest that good personal hygiene is effective in reducing the risk of this potential adverse health effect.

This material and/or its components have been associated with developmental toxicity, reproductive toxicity, genotoxicity, immunotoxicity, and/or carcinogenicity. Refer to Section 11 of this MSDS for additional health-related information.

Conditions Aggravated by Exposure

Disorders of the following organs or organ systems that may be aggravated by significant exposure to this material or its components include: Skin, Respiratory System, Liver, Kidneys, Central Nervous System (CNS)

Target Organs

May cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS).

:inogenic Potential

This material may contain ethylbenzene and naphthalene at concentrations above 0.1%. IARC has identified ethylbenzene and naphthalene as possibly carcinogenic to humans (Group 2B) based on laboratory animal studies. The NTP has determined that naphthalene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence from studies in experimental animals. NTP has determined that exposure to diesel exhaust particulates, a complex mixture of combustion products of diesel fuel, is reasonably anticipated to be a human carcinogen.

OSHA Hazard Classification is indicated by an "X" in the box adjacent to the hazard title. If no "X" is present, the product does not exhibit the hazard as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

OSHA Health Hazard Classification				OSHA Physical Hazard Classification					
Irritant	X	Sensitizer		Combustible	X	Explosive		Pyrophoric	
Toxic		Highly Toxic		Flammable		Oxidizer		Water-reactive	
Corrosive		Carcinogenic		Compressed Gas		Organic Peroxide		Unstable	

SECTION 4. FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid. For more specific information, refer to Exposure Controls and Personal Protection in Section 8 of this MSDS.

Inhalation

Move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately. Keep the affected individual warm and at rest.

Eye Contact

Check for and remove contact lenses. Flush eyes with cool, clean, low-pressure water for at least 15 minutes while occasionally lifting and lowering eyelids. Do not use eye ointment unless directed to by a physician. Seek medical attention if excessive tearing, irritation, or pain persists.

Skin Contact

Remove contaminated shoes and clothing. Flush affected area with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. Do not use ointments. If skin surface is not damaged, clean affected area thoroughly with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists.

Ingestion

Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Never give anything by mouth to a person who is not fully conscious. Do not leave victim unattended. Seek medical attention immediately.

Notes to Physician

INHALATION: Inhalation overexposure can produce toxic effects. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis. Administer supplemental oxygen with assisted ventilation, as required.

INGESTION: If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.

SECTION 5. FIRE FIGHTING MEASURES

NFPA Flammability Classification	NFPA Class-II combustible liquid.
Flash Point	Closed cup: AP 52°C (AP 125°F). (Pensky-Martens.)
Lower Flammable Limit	AP 0.6 % **Upper Flammable Limit** AP 7.5 %
Autoignition Temperature	>254°C (>489°F)
Hazardous Combustion Products	Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons and oxides of sulfur and nitrogen.
Special Properties	Combustible Liquid! This material releases vapors when heated above ambient temperatures. Vapors can cause a flash fire. Vapors can travel to a source of ignition and flashback. A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. Use only with adequate ventilation. If container is not properly cooled, it can rupture in the heat of a fire.
Extinguishing Media	SMALL FIRE: Use dry chemicals, carbon dioxide, foam, water fog, or inert gas (nitrogen). LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.
Protection of Fire Fighters	Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities of potential fire and explosion hazard if liquid enter sewers or waterways.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8 and Disposal Considerations in Section 13 of this MSDS.

Combustible Liquid! Release can result in a fire hazard. Evacuate all non-essential personnel from release area. Establish a regulated zone with site control and security. Eliminate all ignition sources. Stop the leak if it can done without risk. A vapor-suppressing foam may be used to reduce vapors. Properly bond or ground all equipment used when handling this material. Avoid skin contact. Do not walk through spilled material. Verify that responders are properly trained and wearing appropriate personnel protective equipment. Dike far ahead of a liquid spills. Do not allow released material to entry waterways, sewers, basements, or confined areas. This material will float on water. Absorb or cover with dry earth, sand or other non-combustible material. Use clean, non-sparking tools to collect absorbed material. Place spent sorbent materials, free liquids and other clean-up debris into proper waste containers for appropriate disposal. Certain releases must be reported to the National Response Center (800/424-8802) and state or regulatory authorities. Comply with all laws and regulations.

SECTION 7. HANDLING AND STORAGE

Handling

Combustible Liquid!
A static electrical charge can accumulate when this material is flowing through pipes, nozzles or filters and when it is agitated. A static spark discharge can ignite accumulated vapors particularly during dry weather conditions. Always bond receiving containers to the fill pipe before and during loading. Always keep nozzle in contact with the container throughout the loading process. Do not fill any portable container in or on a vehicle. Special precautions, such as reduced loading rates and increased monitoring, must be observed during "switch loading" operations (i.e., loading this material in tanks or shipping compartments that previously containing gasoline or similar low flash point products).

Fire hazard increases as product temperature approaches its flash point. Keep container closed and drum bungs in place. Remove spillage immediately from walking areas. Do not handle or store near heat, sparks or other potential ignition sources. Do not handle or store with oxidizing agents. Avoid breathing mist or vapor. Never siphon by mouth. Do not taste or swallow. Avoid contact with eyes, skin and clothing. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation to maintain exposure potential below applicable exposure levels. Avoid water contamination. Wash thoroughly after handling. Prevent contact with food or tobacco products.

When performing repairs and maintenance on contaminated equipment, keep unnecessary persons from hazard area. Eliminate heat, flame and other potential ignition sources. Drain and purge equipment, as necessary, to remove material residues. Remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

Do not use this material as fuel for equipment, such as portable heaters, in enclosed areas. Hazardous combustion products can cause death.

Protect the environment from releases of this material. Prevent discharges to surface waters and groundwater. Maintain handling, transfer and storage equipment in proper working order.

Misuse of empty containers can be dangerous. Empty containers may contain material residues which can ignite with explosive force. **Cutting or welding of empty containers can cause fire, explosion, or release of toxic fumes from residues.** Do not pressurize or expose empty containers to open flame, sparks, or heat. Keep container closed and drum bungs in place. All label warnings and precautions must be observed. Return empty drums to a qualified reconditioner. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling, or disposing of empty containers and/or waste residues of this material.

Storage

Store in a cool, dry, well-ventilated place. Keep containers tightly closed. Do not store this product near heat, flame or other potential ignition sources. Do not store with oxidizers. Do not store this product in unlabeled containers. Do not puncture or incinerate containers. Ground all equipment containing this material. All electrical equipment in areas where this material is stored or handled must meet all applicable requirements of the NFPA's National Electrical Code (NEC). Store and transport in accordance with all applicable laws.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Provide ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits indicated below. All electrical equipment should comply with the National Electric Code. An emergency eye wash station and safety shower should be located near the work-station.

Personal Protective Equipment

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations. The following pictograms represent the minimum requirements for personal protective equipment. For certain operations, additional PPE may be required.

Eye Protection	Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing, or spraying of this material. A suitable emergency eye wash water and safety shower should be located near the work station.
Hand Protection	Avoid skin contact. Use heavy duty gloves constructed of chemical resistant materials such as Viton® or heavy nitrile rubber. Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.
Body Protection	Avoid skin contact. Wear long-sleeved fire-retardant garments (e.g., Nomex®) while working with flammable and combustible liquids. Additional chemical-resistant protective gear may be required if splashing or spraying conditions exist. This may include an apron, boots and additional facial protection. If product comes in contact with clothing, immediately remove soaked clothing and shower. Promptly remove and discard contaminated leather goods.
Respiratory Protection	Airborne concentration will determine the level of respiratiory protection required. Respiratory protection is normally not required unless the product is heated or misted. For known or anticipated vapor or mist concentrations above the occupational exposure guidelines (see below), use a NIOSH-approved organic vapor respirator equipped with a dust/mist prefilter if adequate protection is provided. Protection factors vary depending upon the type of respirator used. Respirators should be used in accordance with OSHA requirements (29 CFR 1910.134).
General Comments	Warning! Use of this material in spaces without adequate ventilation may result in generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Occupational Exposure Guidelines

Substance	Applicable Workplace Exposure Levels
Nonane, all isomers	**ACGIH (United States).** TWA: 200 ppm 8 hour(s).
Ethylmethylbenzene, all isomers	Not available.
Diesel exhaust particulate	Not available.
Trimethylbenzenes, all isomers	**ACGIH (United States).** TWA: 25 ppm 8 hour(s).
Naphthalene	**ACGIH (United States). Skin** TWA: 10 ppm 8 hour(s). STEL: 15 ppm 15 minute(s). **OSHA (United States).** TWA: 10 ppm 8 hour(s).
1, 2, 4 Trimethylbenzene	Not available.
Cumene	**ACGIH (United States).** TWA: 50 ppm 8 hour(s). **OSHA (United States). Skin** TWA: 50 ppm 8 hour(s).
Ethylbenzene	**ACGIH (United States).** TWA: 100 ppm 8 hour(s). STEL: 125 ppm 15 minute(s). **OSHA (United States).** TWA: 100 ppm 8 hour(s).
Xylene, all isomers	**ACGIH (United States).** TWA: 100 ppm 8 hour(s). STEL: 150 ppm 15 minute(s). **OSHA (United States).** TWA: 100 ppm 8 hour(s).
Sulfur	**ACGIH (United States, 1996).**

Appendix E
Site Maps

LEGEND

- Site Boundary
- Approx. location of underground fuel tank
- 2005 Boring w/no evidence of Fuel Oil
- 2005 Boring with evidence of Fuel Oil
- 2005 Boring encountered obstacle at 3'
- Approx. location of Fuel Oil contamination found in 2007 Archeological Investigation

FORMER FORD MANUFACTURING MILL SITE ENVIRONMENTAL DATA MAP

VILLAGE OF WATERFORD
SARATOGA COUNTY, NEW YORK

N

50 25 0 50 100 Feet

Prepared by: Delaware Engineering, P.C., Sept. 2007
Source: NYS Digital Ortho Imagery, Spring 2004
Saratoga County Digital Tax Parcels, 2004
Topographic Survey of Lands of Water Commissioners, Charles E. Hartnett, 5/2/2005
Sanborn Fire Insurance Map, 1934

Appendix F
Shaw H&S Procedures Required to be Onsite
(CD Provided In Master HASP)

NOTE: SEI health and safety procedures along with required forms that will be utilized during the project are listed below. A copy the Health and Safety Procedures will be included with this HASP or available electronically.

P-EI-HS001	**Environmental Health and Safety Policy**	08/27/2009
HS003	**Philosophy for Corporate Procedures**	07/09/2009
HS009	**New Employee Orientation Health and Safety Checklist**	06/11/2009
HS010	**Employee Health and Safety Manual**	06/04/2009
HS011	**Safety and Health Rules for Contractor**	03/30/2006
HS012	**Chemical Hygiene Plan**	04/24/2002
HS013	**Health and Safety Procedure Variance**	08/03/2009
HS014	**Severe Weather Policies and Procedures**	03/17/2009
HS018	**Safety Councils**	06/04/2009
HS019	**Injury and Illness Prevention Program**	06/04/2009
HS020	**Accident Prevention Program: Reporting, Investigation and Review**	07/16/2003
HS021a	**Tier 1, SR. Management, Leadership Safety Assessments**	11/01/2007
HS021b	**Tier 2 Management Safety Inspections**	11/01/2007
HS021c	**Accident Prevention Program: Management Safety Inspections**	11/01/2007
HS022	**Accident Prevention Program: Review of New Proposals, Projects, Operations, Construction, and Jobs by Health and Safety**	05/06/2009
HS023	**Accident Prevention Program: Employee Safety Incentives & Team Safety Award Program**	09/01/2007
HS025	**Workplace Anti-Violence Policy**	04/11/2006
HS040	**Stop Work Authority**	03/29/2004
HS041	**Embryo-Fetus Protection Program**	04/24/2002
HS045	**Job Safety Analysis (JSA)**	01/7/2003
HS050	**Employee and Subcontractor Training Requirements**	02/19/2007
HS051	**Tailgate Safety Meetings**	03/17/2009
HS052	**Health and Safety Plans**	03/23/2009
HS060	**Hazard Communication Program**	10/27/2003
HS061	**Hazardous Waste Operations and Emergency Response**	02/06/2004
HS062	**Hazardous Waste Operations (RCRA)**	05/22/2008
HS090	**OSHA Regulatory Inspections**	04/24/2002
HS091	**Reporting of Fatality or Multiple Hospitalization Incidents**	04/24/2002

HS100	**Medical Policies and Procedures**	03/21/2008
HS101	**Drug and Alcohol Testing**	12/19/2008
HS102	**Management of Associate Exposure and Medical Records**	04/24/2002
HS104	**Employee Notification of Industrial Hygiene Monitoring Results**	04/24/2002
HS105	**Occupational Injury/Illness Procedures and Return to Work Following a Non-Occupational Medical Absence**	02/13/2004
HS106	**Medical Service and First Aid**	09/26/2002
HS300	**Confined Spaces**	10/31/2008
HS301	**Fall Protection**	09/26/2002
HS302	**Ladder Safety**	05/06/2009
HS303	**Pressurized Water Cleaning and Cutting Equipment**	05/06/2009
HS304	**Compressed Gas Cylinders**	04/25/2002
HS307	**Excavation and Trenching**	02/13/2004
HS308	**Underground / Overhead Utility Contact Prevention**	02/20/2006
HS309	**Underground Storage Tank Removal**	02/13/2004
HS312	**Electrical Safety**	02/13/2004
HS313	**Fire Protection**	02/13/2004
HS314	**Hot Work**	02/13/2004
HS315	**Control of Hazardous Energy Sources (Lockout/Tagout)**	02/13/2004
HS316	**Drill Rig Operations**	02/13/2004
HS400	**Heat Stress**	05/06/2009
HS401	**Cold Stress**	02/11/2004
HS402	**Hearing Conservation Program**	04/25/2002
HS500	**OSHA Regulated Toxic and Hazardous Substances**	02/13/2004
HS502	**Lead Compliance Plan**	02/13/2004
HS503	**Benzene Compliance Plan**	06/04/2008
HS512	**Handling of Blood or Other Potentially Infectious Material**	04/25/2002
HS600	**Personal Protective Equipment**	03/17/2008
HS601	**Respiratory Protection Program**	04/25/2002
HS700	**Policy and Guidance for Developing Radiation Protection Program**	04/22/2008
HS800	**Motor Vehicle Operation: General Requirements**	10/28/2009
HS810	**Commercial Motor Vehicle Operation and Maintenance**	07/12/2005
HS811	**Compliance Requirements for DOT's Emergency Response Information Telephone Number**	02/19/2007
HS820	**Forklift Operation**	02/13/2004

HS822	**Crane Operations**	04/25/2002
HS823	**Rigging & Lifting**	07/18/2002