HUNTSMAN

Port Neches Performance Products

Integrated Contingency Plan

Prepared by

Seebald & Associates International

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[redacted]

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1.0 1.0 Plan Introduction Elements

1.1 Purpose and Scope of Plan Coverage

This plan was written in accordance with the National Response Team's Integrated Contingency Plan (ICP) Guidance and was prepared for Huntsman, LLC Port Neches Performance Products (Huntsman PNPP).

The specific guidelines presented in this plan have been carefully thought out and prepared in accordance with safe practices. This plan has the full approval of management at a level with authority to commit the necessary resources to implement this plan.

The purpose of this plan is to provide a written procedure for directing a plan of action in the event of a release/discharge of oil or oil based products, natural disaster or civilian threat. Adopting such a procedure will allow for a uniform plan of action that will assist in a systematic and orderly manner of coping with the release or incident. This plan of action will minimize confusion and indecision, prevent extensive damage to the facility or injury to personnel, and minimize exposure to personnel within or outside of the facility. Consistent training with this plan will provide the confidence needed for employees to perform their assigned duties.

The overall objective of this plan is to minimize any release that might endanger lives or property, or may jeopardize personnel within or outside of the facility. All personnel, through the use of this plan, will utilize all resources necessary to bring any release under control. In order to prepare for such control, all personnel will be well trained and knowledgeable as to their various roles during a release.

Specifically, this plan:

Identifies the Qualified Individual(s)/Person(s) in Charge (QI/PIC) having full authority to implement this response plan

Requires immediate communication with the appropriate federal officials and persons providing personnel and equipment

Identifies, and ensures by contract or other means approved by the owner/operator, the availability of private personnel and equipment necessary to remove a worst-case discharge and mitigate or prevent a substantial threat of such a discharge

Describes training, equipment testing, periodic unannounced drills, and response actions

1.2 Response Plan Cover Sheet

In accordance with CFR 112.20(h) (11), a Response Plan Cover Sheet must be completed and submitted by owners or operators who are required to prepare and submit a facility-specific response plan. The cover sheet must accompany the response plan as a means to provide the agency with basic information concerning the facility.

1.2.1 PNPP

Owner/operator of facility:	Huntsman, LLC
Facility name:	Port Neches Performance Products
Facility mailing address (street address or route):	P.O. Box 847, Port Neches, Texas 77651
Facility phone number:	409-724-4430 (b) (7)(F) [redacted]
SIC code:	2869
Dun and Bradstreet number:	189049570
(b) (7)(F) [redacted]	[redacted]

Facility distance to navigable water. Mark the appropriate line:

0-1/4 mile:	1/4-1/2 mile:	1/2-1 mile	X	> 1 mile:

Applicability of Substantial Harm Criteria

Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?	YES	X	NO	
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and, within any storage area, does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation?	YES		NO	X
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?	YES	X	NO	
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?	YES		NO	X
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?	YES		NO	X

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and that based on my inquiry of those individuals responsible for obtaining information, I believe that the submitted information is true, accurate and complete.

Signature: _____ Title: Site Manager

Name: Jordan Morgan Date: _____

1.2.2 PNPP Joint Waste Water Treatment Plant

Owner/operator of facility:	Huntsman, LLC
Facility name:	JWWTP Facility
Facility mailing address (street address or route):	P.O. Box 847, Port Neches, Texas 77651
Facility phone number:	409-724-4430
SIC code:	2869
Dun and Bradstreet number:	189049570

(b) (7)(F) [redacted]

(b) (7)(F) [redacted]

Facility distance to navigable water. Mark the appropriate line:

0-1/4 mile:	1/4-1/2 mile:	1/2-1 mile	X	> 1 mile:

Applicability of Substantial Harm Criteria

Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?	YES	NO	X
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and, within any storage area, does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation?	YES	NO	X
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?	YES	NO	X
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Appendix C or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?	YES	NO	X
Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?	YES	NO	X

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and that based on my inquiry of those individuals responsible for obtaining information, I believe that the submitted information is true, accurate and complete.

Signature: _____ Title: Site Manager

Name: Jordan Morgan Date: _____

1.3 Regulatory Applicability

Huntsman has reviewed the National Contingency Plan and the EPA Region VI Regional Integrated Contingency Plan. This plan was written to comply with the following:

PHMSA (Pipeline and Hazardous Materials Safety Administration), DOT

49 CFR 194—Facility Response Plan (FRP)

This regulation applies to an operator of an onshore pipeline that, because of its location, could reasonably be expected to cause substantial harm or significant and substantial harm to the environment by discharging oil into or on any navigable waters of the United States or adjoining shorelines.

US EPA

40 CFR 112.20—Facility Response Plan (FRP)

The EPA regulations require the preparation and implementation of this plan for any non-transportation-related onshore facility that, because of its location, could reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines.

US EPA

40 CFR 264.50 – RCRA Contingency Plans

RCRA requires that all owners and operators of all hazardous waste facilities have a contingency plan which is designed to minimized hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

OSHA

29 CFR 1910.38—Emergency Action Plan (EAP)

The EAP portion has been prepared in accordance with the Occupational Health and Safety Administration regulation, Part 1910.38–Emergency Action Plan. Specifically, this plan outlines fire, evacuation, operations and notification procedures.

USCG

33 CFR 154, Subpart F – Response Plans for Oil Facilities

The USCG regulations require all marine transportation-related facilities that could reasonably be expected to cause harm by discharging oil into navigable waters and adjoining shorelines to prepare a facility response plan incorporating specific criteria to determine the appropriate response resources.

Texas GLO

TAC Title 31, Part 1, Chapter 19—Oil Spill Prevention and Response

The OSPRA regulations require the preparation and implementation of a Discharge Prevention and Response Plan seaward of the GLO Line of Demarcation for facilities located within 100 yards of coastal waters. Facilities must apply for, and obtain, an Oil Spill Prevention and Response Certificate from the GLO prior to beginning operation.

1.4 Plan Distribution

Plan Number	Plan Holder	Location
1	Site Manager	Port Neches Performance Products/JWWTP
2	Qualified Individual	Port Neches Performance Products/JWWTP
3	Alternate Qualified Individual	Port Neches Performance Products/JWWTP
4	Central Control	Port Neches Performance Products/JWWTP
5	Environmental Manager, or designee	Port Neches Performance Products/JWWTP
6	Corporate Office	The Woodlands, Texas
7 (cd)	Environmental Protection Agency (EPA) Region 6	Dallas, Texas
8 & 9 (cd)	U.S. Department of Transportation	Washington, DC
10	Port Neches Fire Department	Port Neches, Texas
11	Groves Fire Department	Groves, Texas
12	Jefferson County LEPC	Beaumont, Texas
13	U.S. Coast Guard	Port Neches, Texas
14	Texas General Land Office	Beaumont, Texas
15	Renewable Biofuels, LLC	Houston, Texas

1.5 Plan Review and Revision

PHMSA, DOT—FRP

If new or different operating conditions or information would substantially affect the implementation of a response plan, the owner/operator must immediately modify the plan to address such a change and, within 30 days of making the change, submit the change to PHMSA. Examples of changes in operating conditions that would cause a significant change to the plan are as follows:

New pipeline construction or purchase

Different worst case discharge volume

Change in commodities transported

Change in cleanup contractors

Change in the Qualified Individual(s)

Change in an NCP/ACP that has a significant impact on the appropriateness of response equipment or response strategies

Change in response procedures

Change in ownership

The QI will incorporate post drill evaluation results and post incident evaluation results into this plan within 90 days. If a worst case discharge occurs on the pipeline, the plan will be evaluated for effectiveness. The plan will be reviewed and resubmitted to PHMSA within five years of the last plan approval date. Modifications to the plan will be included on the Revision Record included as **Table 1A**. Updated materials will also be submitted to all non-regulatory holders of the plan (refer to **Section 1.4**).

EPA—FRP

The owner or operator of a facility shall revise and resubmit revised portions of the response plan within 60 days of each facility change that materially may affect the response to a worst case discharge, including:

A change in the facility's configuration that materially alters the information included in the response plan

A change in the type of oil handled, stored, or transferred that materially alters the required response resources

A material change in capabilities of the oil spill removal organizations(s) that provide equipment and personnel to respond to discharges of oil

A material change in the facility's spill prevention and response equipment or emergency response procedures

Any other changes that materially affect the implementation of the response plan

The EPA-issued facility identification number shall be provided along with any revisions submitted to the Regional Administrator. Plan revisions will be documented in the Revision Record included as **Table 1A.**

EPA—RCRA

The contingency plan must be reviewed, and immediately amended, if necessary, whenever:

The facility permit is revised

The plan fails in an emergency

The facility changes – in its design, construction, operation, maintenance, or other circumstances – in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency

The list of emergency coordinators changes

The list of emergency equipment changes

OSHA—ERP

The owner/operator will review the emergency action plan with each employee covered by the plan in a timely manner:

When the plan is developed or the employee is assigned initially to a job

When the employee's responsibilities under the plan change

When the plan is changed

The owner/operator will inform employees upon initial assignment to a job of the fire hazards to which

they are exposed. The owner/operator will also review with each employee those parts of the fire prevention plan necessary for self-protection.

USCG-FRP

The owner or operator of a facility must review the plan annually within on month of the anniversary date of USCG approval of the plan. The owner or operator must revise and resubmit revised portions of the response plan within 30 days of each facility change that materially may affect the implementation of the plan, including:

A change in the facility's configuration that significantly affects the information included in the plan

A change in the type of oil handled that affects the required response resources

A change in the names or capabilities of the Oil Spill Removal Organization (OSRO)

Revisions to personnel and telephone number lists do not require USCG approval however the USCG and all other holders of the response plan shall be advised of the revisions and provided a copy of the revisions as they occur

TGLO Discharge Prevention and Response Plan (DPRP)

Facilities must apply for an Oil Spill Prevention and Response Certificate from the GLO prior to beginning operation. After the GLO determines the application is administratively complete, the GLO will contact the facility operator to schedule an on-site inspection and review of their Discharge Prevention and Response Plan. The Plan must support the facility's current operations and must be developed in accordance with Title 31, Part 1, Chapter 19, Subchapter B, Rule §19.13—Requirements for Discharge Prevention and Response Plans.

The GLO will issue an Oil Spill Prevention and Response Certificate with a term of five years from the date of issuance. Each Certificate will be assigned an identification number, which will allow the facility operator to review and amend the facility information on the GLO's Oil Spill Prevention and Response Program interactive website. The identification number will be sent to the person who signed the application form, along with instructions on how to update and renew the certificate.

The Certificate becomes void when there is a change in the operator, or when the facility changes its operations in a manner that increases its facility classification level. These changes will require the operator to update the Discharge Prevention and Response Plan and apply for a new Certificate. Plan revision will be documented in the Revision Record included as **Table 1A**.

Table 1A
Revision Record

Date of original printing: August 11, 1994 Document Revision and Change Request

Rev.	Date	Section Altered	Description of Change
1	11/1/94	3-2, 3-14, 5-1, 5-2, 5-5, 6-1, 6-2, 6-14	R.W. Stegall - home address and telephone changes
2	1/13/95	iv, v, viii, ix, 1-2, 1-3, 1-10, 1-16, 1-20, 1-21, 1-27, 1-29, 2-1, 2-2, 2-3, 3-3, 3-4, 3-14, 5-1, 5-2, 5-6, 6-1, 6-2, 6-14, 7-1, 7-2, Section 8, 9-7, 9-8, 9-9, 10-1, 10-2, 10-3, 10-4, 11-1, 11-6, 11-7, 11-8, 14-12, 14-13, 14-14, Exhibits 1.1, 1.2, 5.1, 6.1, 7.1, and 10.1, Appendices A, B, G, H, I, and J, Figures 2.2, 2.4, 5.3, 6.6 and 9.1	EPA's request for additional information
3	4/24/97	Entire manual reformatted	Format manual to "One Plan", recalculate Worst-Case Discharge Volume, recalculated Fixed Facility Release Frequency, recalculate Response Planning Volumes, recalculate Small and Medium Case Discharge Volumes, revise Incident Command System and Emergency Action Plan, insert new FRP Cover Sheet, delete OSRO Contracts and Equipment Lists, insert LOI from OSRO, make manual consistent with ACP.
3A	08/14/98	I-22, I-24, I-26, I-27, II-4, II-5, III-1-14, III-2-12, III-2-13, III-2-16, III-2-17, III-2-18, III-3-3, III-3-4, III-3-5, III-3-6, III-3-13, III-3-26, III-3-30, III-3-31, III-3-32, III-3-33, III-3-53, III-3-54, III-3-55, III-3-58, III-3-60, III-3-68, III-3-100, III-3-152, III-3-153, III-3-159, III-3-161, III-3-163, III-3-165, III-6-3, III-6-4, III-7-12, III-7-14, III-7-22, III-8-1, III-8-2, III-8-5, III-8-6, III-8-16, III-8-17	Annual review and revision per J. Williams, and Carl Huckaby
4	08/31/98	Converted to PDF format.	Entire manual converted to PDF format per John Williams.
4a	01/15/99	III-2-12, III-2-13, III-2-21, III-3-6, III-3-7, III-3-100, III-6-1, III-6-3, III-6-4, III-6-5, III-8-3, III-8-4a	Quarterly review and revision per John Williams
4b	05/04/99	I-3, I-4, I-22, I-24, I-26, I-27, III-2-12, III-2-20, III-3-6, III-6-3	Incident Commander Change per John Williams
4c	06/29/99	I-1, I-2, I-3, I-4, I-5, I-6, I-7, I-7a, I-14, I-21, I-22, I-23, I-24, I-25, I-26, I-27, I-27a, II-1, II-4, II-5, II-6, II-7, II-8, III-1--1, III-1-3, III-1-4, III-1-5a, III-1-5b, III-1-11a, III-1-13a, III-1-13b, III-1-14, III-1-17, III-1-18, III-2-3, III-2-4, III-2-6, III-2-7, III-2-8, III-2-8a, III-2-10, III-2-11, III-2-12, III-2-13, III-2-14, III-2-18, III-2-20, III-3-6, III-3-11, III-3-12, III-3-14, III-3-16, III-3-20, III-3-21, III-2-22, III-2-23, III-3-28, III-3-38, III-3-38a, III-3-38b, III-3-38c, III-3-38d, III-3-38e, III-3-38f, III-3-38g, III-3-38h, III-3-46, III-3-75, III-3-76, III-3-77, III-3-101, III-3-102, III-3-129,III-3-131,III-4-1, III-6-3, III-6-4, III-6-5, III-8-13	Quarterly review and revision per John Williams with RMP updates and revisions per Robert Sharpley.
4d	01/16/01	IIII-1-14, III-1-15, III-2-4, III-2-12, III-2-13, III-2-15, III-2-16, III-2-18, III-2-21, III-2-22, III-3-3, III-3-24, III-3-88, III-3-89, III-3-131, III-3-137, III-3-138, III-3-139, III-3-140, III-3-142, III-3-144, III-3-147, III-3-150, III-3-151, III-3-152, III-3-153, III-5-2, III-5-6, III-6-4, III-6-5, III-8-30, III-8-31	Review and revisions per John Williams and prepared by Scott R. Sipole

4e	02/28/01	I-5	Revisions per John Williams and prepared by Scott R. Sipole
4f	09/18/01	II-9, II-15, III-1-5, III-1-6, III-1-13, III-2-6, III-2-7, III-2-20, III-3-22, III-3-47, III-3-49, III-3-104, III-6-4	Revisions per J.D. Launey
5	12/31/02	Entire manual revised to reflect 40 CFR 112 July 2002 changes.	Revisions per Scott R. Sipole and Todd McLane
6	05/14/04	III-2-14, III-2-15	Revisions per Phillip Schreiber
7	07/18/05	III-5-1	Included training certification language per Phillip Schreiber
8	8/25/05	III-2-14, III-2-15, III-2-16, III-2-17, III-2-18, III-2-19 III-2-21, III-2-23	Review and revisions per Phillip Schreiber
9	01/24/06	III-2-14, III-2-15, III-2-16, III-2-17, III-2-18, III-2-19 III-2-21, III-2-23	Review and revisions per Phillip Schreiber
10	04/10/07	Entire manual revised to reflect JCO split and more user-friendly manual.	Revisions per Martin Novich
11	08/18/08	Sections 1, 2, 4, Appendix A, B, Annex A replaced, updated Appendix D with additional MSDS Sheets.	Revisions to update personnel and include addition of RBF Unit at site.
12	11/04/2010	2.2, 2.6, 2.11.1, 3.1, Figure 2, 4.2, 4.6, 6.3.2, 7.6,, 8.5, 8.5.1, 8.7, Appendix A, Appendix C, Appendix G .	New QI Letters, corrected calculation for Worse Case discharge, new cross-reference for 33CFR154.1030, new spill mitigation procedures, description of QI, new equipment lists for OSRO, additional diagrams in Appendix A, more drawings and detail for the Bio Diesel facility, Appendix C, entirely new Appendix G including new Sensitive Indexes and new response guidelines to protect sensitive areas, new information for disposal plan, New list of Acronyms.

Huntsman will review the plan annually as noted in **Table 1B**.

Table 1B
Annual Review

8/18/08	**Tom Colwell/Mike Miller**	
8/18/09	Tom Colwell/Mike Miller	
8/18/10	Tom Colwell/Mike Miller	

1.6 Management Certification

Huntsman has developed this plan for Port Neches Performance Products to prevent and/or control the spills of oil or hazardous substances. Huntsman herein commits the necessary resources to fully prepare and implement this plan and has obtained through contract the necessary private personnel and equipment to respond, to the maximum extent practicable, to a worst case discharge or substantial threat of such a discharge.

Jordan Morgan

Certifying Representative (Print)

Site Manager

Title

Signature

Date

2.0 Information Summary

2.1 Facility Overview

Facility	Owner and Operator
Port Neches Performance Products	Huntsman, LLC
2701 Spur 136	10003 Woodloch Forest Drive
Port Neches, Texas 77651	The Woodlands, Texas 77380
(409) 722-8381	(713) 235-6000

The following facilities are covered under this ICP:

- Port Neches Performance Products (consisting of Oxides & Olefins, or O&O Facility; Propylene Oxide/Methyl-Tert-Butyl-Ether, or PO/MTBE Facility; and Renewable Biofuels, or RBF facility)
- PNPP Joint Waste Water Treatment Plant, JWWTP
- Dock Facility
- DOT Pipelines

Facility exhibits are included in **Appendix A** while a brief description of each of the facilities follows.

2.1.1 Port Neches Performance Products (PNPP)

The facility is located on approximately 2,400 acres. It is within the Neches River watershed east of Port Neches at Hogaboom Road and Highway 366. Construction of the facility began in 1943 and the facility began operating in February 1944. The major raw material, ethylene, is received by pipeline. This material also is produced in the ethylene unit at PNPP. Ethylene is converted into ethylene oxide by a silver-catalyzed vapor phase reaction with oxygen. This chemical is consumed in-house and at other Huntsman locations for many derivative products.

Ethylene oxide is reacted with water to produce different grades of ethylene glycol. Ethylene glycol is sold to other chemical companies. Ethylene oxide is also reacted with ammonia to produce ethanol amines, for use as a gas-scrubbing agent, and for use as a base material for cosmetics, toiletries, and skin lotions.

A co-product of the glycol reaction, diethylene glycol, is reacted with ammonia to produce morpholine. This material is sold as a corrosion inhibitor, an optical brightener, and an activator in the manufacture of rubber. Diglycolamine is also produced at PNPP facilities.

The Oxide Specialties Unit uses ethylene oxide in various reactions to produce materials used in soaps, detergents, emulsifiers, wetting agents, cosmetics, textiles, paper manufacturing, and agricultural chemicals.

The PO/MTBE facility is designed to produce Propylene Oxide and Methyl-Tert-Butyl-Ether. MTBE is a gasoline additive used to boost octane rating as an oxygenated compound, which assists in the combustion of gasoline, thereby reducing air pollution. PO is used to make foams, paints, soaps, and rocket fuel.

The RBF facility is designed to produce biodiesel and crude glycerine as end products. Biodiesel is an alternative fuel used for general transportation purposes and glycerine is used commercially in many products such as cosmetics, antifreeze, or other chemical processing. The process feed oil consists of vegetable oils and animal fats which are delivered to the facility via rail, truck and marine vessel. Major chemicals used to process the feed oil include primarily acids, caustic, methanol and sodium methylate which are delivered into the facility via pipeline or truck. Finished products are transported via rail, truck, pipeline and marine vessel.

The Co-generation Unit produces a significant portion of electric power and steam requirements for the facility.

2.1.2 PNPP Joint Waste Water Treatment Plant (JWWTP)

The PNPP Joint Waste Water Treatment Plant is at Spur 136 near Highway 366. The JWWTP collects wastewater streams from PNPP and surrounding facilities. Treated effluent is discharged through an NPDES permitted outfall.

The JWWTP Facility consists of one concrete blending basin, one concrete neutralization basin, three primary clarifiers, an 8-million gallon equalization basin where streams from the facilities are charged, an 8-million gallon storm water surge basin that collects runoff diverted during heavy rains, two 5.3-million gallon aeration basins, three secondary clarifiers, a biosludge thickener, two aerobic digesters to stabilize waste activated sludge, a 20-million gallon polishing pond, and ten 5 acre land farm plots.

2.1.3 Dock Facility

The PNPP Dock is located on East Port Neches Road and Neches River Mile Marker 281.5, approximately one quarter mile east of the Motiva Dock facility. This facility:

Loads ethylene glycol DEA, MEA, morpholine, cyclohexane, propylene oxide, and biodiesel into tanker vessels. Cyclohexane is loaded at a rate of 900 bbl/hr into 10 or 25,000 barrel barges.

Off-loads caustic, DEG, off test (spent) ethylene glycol, vegetable oils, and animal fats from tanker vessels.

2.1.4 DOT Pipelines

There is 1 DOT pipeline which has the potential to handle oil (petroleum products and intermediates) between Huntsman and other facilities. This pipeline, listed in **Section 2.6**, comprise one response zone, called the Port Neches Response Zone. The response zone spans Jefferson County, Texas. The product carried by this pipeline is a distillate. Most materials handled via pipeline are not regulated as oil as discussed in **Section 2.6**. A flowchart and maps showing oil transfer pipelines are located in **Appendix A**.

Reportable Oil Spill History– there have been no reportable oil spills from the Port Neches Response Zone pipelines.

2.2 Qualified Individuals

The Qualified Individual(s)/Person(s) in Charge have the responsibility and authority to initiate spill cleanup operations, obligate funds to carry out response activities, and act as liaison with the pre-designated Federal On-Scene Coordinator (FOSC). All personnel can be contacted on a 24 hour basis. The QI may be contacted for further information or explanation of the duties of individuals under the ICP.

Name/Position	Office	Cell	Home
Qualified Individual			
Morgan Jordan	(409) 724-4669	(606) 922-0218	(b) (6)
Alternate Qualified Individual			
Martin Novich	(409) 723-3545	(409) 344-3521	(b) (6)

HUNTSMAN

Subject: APPOINTMENT OF QUALIFIED INDIVIDUAL
To: Mr. Jordan Morgan
From: John Prows

You are hereby appointed as the Qualified Individual for Huntsman Corporation, Port Neches, Texas (PNPP) as specified in 33 Code of Federal Regulations Part 1026. As a Qualified Individual during a spill incident, you are hereby given full authority to:

1) Activate and engage in contracting with oil spill removal organization(s);

(2) Act as a liaison with the pre-designated Federal On-Scene Coordinator (OSC); and

(3) Take all necessary actions and obligate funds required to carry out the required response activities.

Should you need any clarification on the scope of these responsibilities, please contact me.

Title: VP Manufacturing Excellence

Name: John Prows

Signature

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HUNTSMAN

Subject: APPOINTMENT OF ALTERNATE QUALIFIED INDIVIDUAL
To: Mr. Martin Novich
From:

You are hereby appointed as the Qualified Individual for Huntsman Corporation, Port Neches, Texas (PNPP) as specified in 33 Code of Federal Regulations Part 1026. As a Qualified Individual during a spill incident, you are hereby given full authority to:

1) Activate and engage in contracting with oil spill removal organization(s);

(2) Act as a liaison with the pre-designated Federal On-Scene Coordinator (OSC); and

(3) Take all necessary actions and obligate funds required to carry out the required response activities.

Should you need any clarification on the scope of these responsibilities, please contact me.

Title: Vice President Manufacturing Excellence

Name: John Prows

Signature

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2.3 Significant and Substantial Harm Determination

In accordance with 49 CFR 194.103, a line section can be expected to cause significant and substantial harm to the environment in the event of a discharge of oil into or on the navigable waters or adjoining shorelines if; the pipeline is greater than 6 5/8 inches (168 millimeters) in outside nominal diameter, greater than 10 miles (16 kilometers) in length, and the line section:

1) Has experienced a release greater than 1,000 barrels (159 cubic meters) within the previous five years,

Has experienced two or more reportable releases, as defined in §195.50, within the previous five years,

Containing any electric resistance welded pipe, manufactured prior to 1970, operates at a maximum operating pressure established under §195.406 that corresponds to a stress level greater than 50 percent of the specified minimum yield strength of the pipe,

Is located within a 5 mile (8 kilometer) radius of potentially affected public drinking water intakes and could reasonably be expected to reach public drinking water intakes, or

Is located within a 1 mile (1.6 kilometer) radius of potentially affected environmentally sensitive areas, and could reasonably be expected to reach these areas.

Some Huntsman PNPP pipelines can be expected to cause significant and substantial harm based on the above-stated criteria number 5. Those sections are noted in **Section 2.6.** Refer to **Appendix G** for an overview map showing the locations of environmentally sensitive areas.

2.4 Containers

Oil containers consist of tanks and drums used to store products, intermediates, and fuel and oil for operation of facility process equipment and vehicles. These containers undergo inspection and/or preventative maintenance and repair in accordance with good engineering practices. **Table 2** is a listing of all containers along with descriptive parameters which would allow for the evaluation of hazards (as defined in 40 CFR 112, Appendix F).

Table 2

Container Listing

Tank ID	Huntsman Asset No.	Tank Contents	(b) (7)(F)	onstruction	Date of Construction	Containment (Y/N)
		Port Nech		**e Products**		
A48	T-F6-101	Hot Oil		Steel	1978	Y
A49	T-F6-1	Hot Oil		Steel	1967	Y
A50	T-O-39	Waste Oil		Steel	1967	Y
A51	T-O-40	Waste Oil		Steel	1967	Y
A52	T-F4-1	Hot Oil		Steel	1961	Y
A53	T-O-88	Waste H_20		Steel	1974	Y
A54	T-A3-29	T-30 mixed HC solvent "wash oil"		Steel	1962	Y
A55	T-A2-12	Lube Oil		Steel	1968	Y
A57	T-O-43	Wash Oil		Steel	1974	Y
A58	T-O-127	Pyrolysis Fuel		Steel	1958	Y

(b) (7)(F)

A59	T-O-126	Pyrolysis Fuel	Steel	1958	Y
A60	T-O-87	Pyronaphtha	Steel	1974	Y
A61	T-T-170	Diesel Fuel	Steel	1974	Y
A62	T-T-168	Kerosene	Steel	1974	Y
A63	T-U-5	Diesel Fuel	Steel	1968	N
A64	T-U-4	Diesel Fuel	Steel	1979	N
A65	T-U-6	Diesel Fuel	Steel	1968	N
Tank ID	**Huntsman Asset No.**	**Tank Contents**	**onstruction**	**Date of Construction**	**Containment (Y/N)**
A66	NA	Diesel Fuel	Steel	NA	N
A69	T-U-11	Diesel Fuel	Steel	1991	Y
A76	T-O-144	Diesel Fuel	Steel	1985	Y
B4	T-T-176	Gasoline	Steel	1988	Unknown
N/A	N/A	Oil Mist Drum (8)*	N/A	N/A	Unknown
N/A	N/A	Oil Drums (8-12)*	N/A	N/A	Unknown
			y		
A44	NBP-TK-6	Diesel Fuel	Steel	1981	Y
A45	NBP-TK-7	Diesel Fuel	Steel	1993	Y
A46	Temp#1	Diesel Fuel	Steel	Temp	N
A47	Temp#2	Diesel Fuel	Steel	2002	Y
N/A	N/A	Oil Drums (4)*	N/A	N/A	Unknown
			ty		
A70	F-F5-167	Process Liquid Fuel (haz waste)	Steel	1994	Y
A71	F-F5-168	Process Liquid Fuel (haz waste)	Steel	1994	Y
A72	P-L2-016	Diesel Fuel	Steel	1994	Y
A73	P-L2-017	Diesel Fuel	Steel	1994	Y
A74	P-L2-018	Diesel Fuel	Steel	1994	Y
A79	Dow Pond	Diesel Fuel	Steel	Temp	N
N/A	N/A	Oil Drums (8-12)*	Steel	N/A	Unknown
B1-1101	N/A	Feed Oil, FFA, Water	CS	2008	Y
B1-1102	N/A	Feed Oil, FFA, Water	CS	2008	Y
B1-1103	N/A	Feed Oil, FFA, Water	CS	2008	Y
B1-1104	N/A	Feed Oil, FFA, Water	CS	2008	Y

B1-2127	N/A	Feed Oil, FFA, Water	(b) (7)(F)	CS	2008	Y
B1-1105	N/A	Biodiesel, Water		CS	2008	Y
B1-1106	N/A	Biodiesel, Water		CS	2008	Y
B1-2105	N/A	Biodiesel, Water		CS	2008	Y
B1-2106	N/A	Biodiesel, Water		CS	2008	Y
B1-2150	N/A	Biodiesel, Water		CS	2008	Y
B1-2151	N/A	Biodiesel, Water		CS	2008	Y
B1-1107	N/A	Grease Oil, FFA, Water		CS	2008	Y
N/A	N/A	Oil Drums (8-12)*		Steel	N/A	Y

*Variable in location within process units and associat t equipment/repair activity.

2.5 EPA Discharge Volume Calculations

2.5.1 Port Neches Performance Products/JWWTP

Worst Case Discharge

A procedure for determining worst case discharge planning volume for onshore storage, *Secondary Containment—Multiple-Tank Facilities* has been defined by the EPA in 40 CFR 112, Appendix D.

1) Are all above ground oil storage tanks or groups of above ground oil storage tanks at the facility without adequate secondary containment? No
2) If the answer is NO, calculate the total above ground oil storage capacity of tanks without adequate secondary containment. If all above ground oil storage tanks or groups of above ground oil storage tanks at the facility have adequate secondary containment, ENTER "0" (zero). **2,000 gal (48 bbl)**

Finally, calculate the capacity of the largest single above ground oil storage tank within an adequate secondary containment area or the combined capacity of a group of above ground oil storage tanks permanently manifolded together, whichever is greater, plus the volume from question 2. (b) (7)(F)

Medium Discharge

A medium discharge is defined by 40 CFR, Appendix E as having a maximum volume of 36,000 gallons of oil or 10 percent of the worst case discharge, whichever is less. **36,000 gal (857 bbl**)

Small Discharge

A small discharge is defined by 40 CFR, Appendix E as any volume less than or equal to 2,100 gallons, but not to exceed the calculated worst case discharge volume. **2,100 gal (50 bbl)**

2.6 Worst Case Discharge - Pipelines

Most raw materials and products moved via pipeline by Port Neches Performance Products Operations do not meet the definition of 'oil' as defined under 33 CFR 154.105 (USCG – Facility Response Plans) and/or 49 CFR 194.5 (DOT – Response Plans for Onshore Pipelines). This determination is based on the physical properties of the material or the regulatory status of the material. Many raw materials and products have a vapor pressure greater than atmospheric pressure and this physical property will cause it to vaporize in the event of a release during pipeline transportation (i.e., not liquid at atmospheric pressure and temperature).

The following table has been developed to provide the following:

Pipeline segments operated by Huntsman PNPP and the materials transported by each segment

Identify oil containing pipeline segments

Worst case discharge volume calculations for each line section in accordance with the requirements of 33CFR154.1029

The worst case discharge line section within the response zone (line volume noted in **boldface**)

All line sections expected to cause significant and substantial harm to the environment in the event of a discharge (denoted in the table with *)

(b) (7)(F) [redacted]

(b) (7)(F) [redacted]

(b) (7)(F)

[redacted]

ID	Length (mi)	Diam. (in)	(b) (7)(F)	Product	Vapor Pressure >1 ATM	[1]Oil	Flow (bbls/hr)	(b) (7)(F)	(b) (7)(F)
101	1.36	6"/8"		MTBE-HIF	No	No	17.5M lbs/day		
102	3.25	6"/8"		MTBE-HIF	No	No	50M lbs/day		
103	1.10	6"		MEOHCR/Crude Methanol	No	No	40M lbs/day		
104	1.06	4"		MTBE-HF	No	No	1M lbs		
105	1.32	6"		Propylene Oxide	No	No			
106	1.32	6"		Propylene Oxide	No	No			
107	3.00	4"		Pipeline is idle (sludge)	NA	NA			
207	11.70	6"/8"/16"		Feed Gas to A3	Yes	No			
209	12.67	4"/8"		Ethylene	Yes	No			
211	0.61	6"		Pipeline is idle	NA	NA			
216	1.32	6"		Ethylene Glycol Polyester Grade	No	No			
217	1.32	6"		Ethylene Glycol-AFG	No	No			
218	1.32	3"		Liquid Caustic Soda 50%	No	No			
219	6.60	3"		Aromatic Distillate	No	Yes	50		
220	0.65	6"		Pipeline is idle	NA	NA			
222	0.36	6"		Steam	NA	NA			
223	1.92	8"		Propylene Glycol USP	No	No			
224	1.92	6"		Monethanolamine, MEA Monethanolamine, LCI Monethanolamine, NF	No No No	No			

[1] Reference: Definition of "oil" provided in 33 CFR 154.105 U.S. Coast Guard – Facility Response Plans and 49 CFR 194.5 DOT – Response Plans for Onshore Pipelines. No definition of oil is provided under 29 CFR 1910.120 OSHA – HAZWOPER, 20 CFR 1910.38(a) and §1910.119 OSHA – Emergency Action Plans and Process Safety, or 40 CFR 68 Chemical Accident Prevention – Risk Management Plans. Also reference U.S. Coast Guard "List of Petroleum and Non-petroleum Oils" and chemicals provided in 46 CFR 150, Table 1.

ID	Length (mi)	Diam. (in)	(b) (7)(F)	Product	Vapor Pressure >1 ATM	Oil	Flow (bbls/hr)	(b) (7)(F)
225	1.92	6”		Triethanolamine-85%, LFG Triethanolamine-99% Triethanolamine-99% NF Triethanolamine-85% NF Triethanolamine-85%, TEA-85	No No No No No	No No No No No		
227	2.77	18”		Waste Water	NA	NA		
228	0.01	12”		Sewer	NA	NA		
229	0.00	12”		Pipeline is idle (Calcium Chloride)	NA	NA		
230	0.11	36”		Raw Water	NA	NA		
231	0.46	6”		Water	NA	NA		
232	0.00	10”		Pipeline is idle (Contaminated Water)	NA	NA		
233	0.69	10”		Praxair Oxygen	NA	NA	2.95M lbs/day	
234	0.77	6”		Water	NA	NA		
235	0.34	6”		Water	NA	NA		
236	7.70	12”		Pipeline is idle (Feed Gas)	NA	NA		
237	7.70	6”/8”		Pipeline is idle	NA	NA		
238	0.26	36”		Raw Water	NA	NA		
239	0.22	6”		Nitrogen	NA	NA		
240	0.08	3”		Sulfur Dioxide	Yes	No		
307	2.60	4”		MTBE/TBA	No	No		
308	2.60	4”		MEOHCR/Crude Methanol	No	No		
309	3.00	2”		Pipeline is idle	NA	NA		
310	3.00	2.5”		Pipeline is idle	NA	NA		
319	1.13	2”/3"		Crude Butadiene/BDECRUDE	Yes	No		
328	2.07	4”		Hydrogen	Yes	No		
416	6.75	8”		Propylene R/G	Yes	No		
417	2.07	8”		Pipeline is idle	NA	NA		
B1-PF-010	**2.6**	**12”**		**Biodiesel, Vegetable Oil**	**No**	**Yes**	**6428**	

2.7 Emergency Response Equipment

2.7.1 Communications Equipment

Cellular phones and VHF/UHF radio communication systems will be utilized in case of an emergency. Huntsman has approximately 1000 radios, 1 radio tower, 10 repeaters, a paging base, UHF repeaters for the Whelan Emergency Notification System, and VHF radios at the PNPP main gate. Huntsman is also a member of HAREN, the Houston Area Radio Emergency Network. Radios can be exchanged with the OSRO during the incident to ensure equipment compatibility. Primary emergency response communication is VHF/UHF radio systems. In the event of a radio system failure, secondary precedence is cellular telephone systems.

2.7.2 Oil Spill Response Equipment

Garner Environmental is under contract to provide response equipment and personnel in the event of an unauthorized discharge (refer to **Section 2.12**). A complete list of equipment available to the OSRO is contained in Appendix C. The OSRO has extensive subcontracts with other OSRO's nationwide and can scale up its resources quickly. The maximum size ship that can be accommodated at our pier is 700ft. the OSRO indicated he will supply at least 1400ft of containment boom and the means of deploying and anchoring the boom in within 45 minutes of detection of the spill. (b) (7)(F) [redacted]

2.7.3 Fire Fighting Equipment

Huntsman maintains the following fire fighting equipment throughout the PNPP complex:

Type	Quantity	Location
1250gpm Foam Pumper w/1000 gal foam	1	PNPP
Fireboss 1500 lb Dry Chemical Extinguisher - PKP	1	PNPP
Rescue Trailer	1	PNPP
Portable Breathing Air Compressor 13.5 SCFM	1	PNPP
Apparatus trailer - High pressure cascade system - spare bottles	1	PNPP
F350 pickup truck - X32001	1	PNPP
F350 pickup truck - X32002	1	PNPP
F350 Flatbed	1	PNPP
Freightliner Tractor	1	PNPP
Foam Tank Wagons (6000 gallons)	2	PNPP
Mobile Command Center	1	PNPP
6000 gpm trash pump	1	PNPP
Portable generator/light tower	1	PNPP
6000 gpm portable fire pump	1	PNPP
4000 gpm portable fire pump	1	PNPP
3000 gpm portable fire pump (rear)	1	PNPP
3000 gpm portable fire pump (side)	1	PNPP
2000 gpm portable fire pump	1	PNPP
6000 gpm hydro foam portable monitor	1	PNPP
2000 gpm hydro foam portable monitor	3	PNPP
Hazmat trailer	1	PNPP
Hose trailer w/5000 ft 5" fire hose	2	PNPP

Type	Quantity	Location
Forklift	1	PNPP
Lowboy trailer	1	PNPP
Grass fire trailer w/portable pump and 600 gal water	2	PNPP
ATV	2	PNPP
ATV trailer	1	PNPP
Fire extinguishers	1500	PNPP
Firefighting foam	25,000 gal	PNPP
SCBA's	202	PNPP
Escape packs	151	PNPP
Portable air carts	18	PNPP
Portable generators	6	PNPP
Stationary breathing air compressor 13.5 SCFM	1	PNPP

2.8 Planning Volumes

Planning volumes were determined for Oil Group 1 and Group B using the Worksheet to Plan Volume of Response Resources for Worst Case Discharge found in 40 CFR 112, Appendix E. The EPA worst case discharge volume for PNPP was used for the worksheet in **Figure 1** because it is considered the most conservative number for planning purposes.

Figure 1
Worksheet to Plan Volume of Response Resources for Worst Case Discharge Petroleum Oils—Group 1

(40 CFR 112, App. E, Attachment E-1)

Part I Background Information

Step (A) Calculate Worst Case Discharge in barrels (in Appendix D): (b) (7) (A)

Step (B) Oil Group: **1**

Step (C) Operating Area (choose one): ☐ Nearshore/Inland Great Lakes ☒ Or Rivers and Canals

Step (D) Percentages of Oil

Percent Lost to Natural Dissipation	Percent Recovered Floating Oil	Percent Oil Onshore
80	**10**	**10**
(D1)	(D2)	(D3)

Step (E1) On-Water Oil Recovery: Step (D2) x Step (A) / 100 — (b) (7)(F)

Step (E2) Shoreline Recovery: Step (D3) x Step (A) / 100

Step (F) Emulsification Factor: **1.0** (F)

Step (G) On-Water Oil Recovery Resource Mobilization Factor

Tier 1	Tier 2	Tier 3
0.3	**0.4**	**0.6**
(G1)	(G2)	(G3)

[1] A facility that handles, stores, or transports multiple groups of oil must do separate calculations for each oil group on site except for those oil groups that constitute 10% or less by volume of the total oil storage capacity at the facility. For purposes of this calculation, the volume of all products in an oil group must be summed to determine the percentage of the facility's total oil storage capacity.

Part II On-Water Oil Recovery Capacity (barrels/day)

(b) (7)(F)

Step (E2) x Step (F)

Part IV On-Water Response Capacity by Operating Area
*Amount needed to be contracted for in barrels/day

Tier I	Tier 2	Tier 3
1,875	**3,750**	**7,500**
(J1)	(J2)	(J3)

Part V On-Water Amount Needed to be Identified, but not Contracted for in Advance (barrels per day)

Tier 1	Tier 2	Tier 3
0	**0**	**0**
Part II Tier 1-Step (J1)	Part II Tier 2-Step (J2)	Part II Tier 3-Step (J3)

NOTE: To convert from barrels/day to gallons/day, multiply the quantities in Parts II through V by 42 gallons/barrel.

Figure 1 cont.
Worksheet to Plan Volume of Response Resources for Worst Case Discharge
Animal Fats and Vegetable Oils—Group B

(40 CFR 112, App. E, Attachment E-2)

Part I Background Information

Step (A) Calculate Worst Case Discharge in barrels (in Appendix D): (b) (7) (A)

Step (B) Oil Group: **B**

Step (C) Operating Area (choose one): ☐ Nearshore/Inland Great Lakes ☒ Or Rivers and Canals

Step (D) Percentages of Oil

Percent Lost to Natural Loss	Percent Recovered Floating Oil	Percent Oil Onshore
20	**15**	**65**
(D1)	(D2)	(D3)

Step (E1) On-Water Oil Recovery: Step (D2) x Step (A) / 100

Step (E2) Shoreline Recovery: Step (D3) x Step (A) / 100 (b) (7)(F)

Step (F) Emulsification Factor: **2.0** (F)

Step (G) On-Water Oil Recovery Resource Mobilization Factor

Tier 1	Tier 2	Tier 3
0.3	**0.4**	**0.6**
(G1)	(G2)	(G3)

[1] A facility that handles, stores, or transports multiple groups of oil must do separate calculations for each oil group on site except for those oil groups that constitute 10% or less by volume of the total oil storage capacity at the facility. For purposes of this calculation, the volume of all products in an oil group must be summed to determine the percentage of the facility's total oil storage capacity.

Part II On-Water Oil Recovery Capacity (barrels/day)

Tier 1	Tier 2	Tier 3
(b) (7)(F)		)

Step (E2) x Step (F)

Part IV On-Water Response Capacity by Operating Area
*Amount needed to be contracted for in barrels/day

Tier I	Tier 2	Tier 3
1,875	**3,750**	**7,500**
(J1)	(J2)	(J3)

Part V On-Water Amount Needed to be Identified, but not Contracted for in Advance (barrels per day)

Tier 1	Tier 2	Tier 3
1789	**1136**	**0**
Part II Tier 1-Step (J1)	Part II Tier 2-Step (J2)	Part II Tier 3-Step (J3)

NOTE: To convert from barrels/day to gallons/day, multiply the quantities in Parts II through V by 42 gallons/barrel.

2.9 Discharge Response Scenarios

2.9.1 Discharge Categories

Huntsman has calculated discharge volumes for the PNPP facilities. These volumes are used for planning purposes.

A small discharge is defined in 40 CFR 112 as any discharge volume less than or equal to 2,100 gallons, provided this volume is less than the worst-case discharge volume.

A medium discharge is defined in 40 CFR 112 as any spill volume greater than 2,100 gallons and less than or equal to 36,000 gallons, or 10 percent of the capacity of the largest tank at the facility, whichever is less, provided that this amount is less than the worst-case discharge.

The worst-case discharge volume will be calculated using the method described in Part A of Appendix D of 40 CFR 112, "Worst Case Discharge Planning Volume Calculation for Onshore Storage Facilities." For multiple tank facilities, this volume is calculated by adding the volume of the aboveground storage tanks without adequate secondary containment and the volume of the largest storage tank inside secondary containment.

Various factors affecting response efforts relative to each category are addressed in **Table 3**.

Table 3
Factors Affecting Response Efforts

Factor	Small	Medium	Worst Case
1. Discharge Size	50 bbl	857 bbl	(b) (7)(F)
2. Proximity to sensitive wells, waterways, and drinking water intakes	N/A	Limit waterway use	Limit waterway use
3. Proximity to fish and wildlife and sensitive environments	N/A	Boom off sensitive areas	Boom off sensitive areas
4. Likelihood that the discharge will travel offsite	Low	Medium	High
5. Location of material discharged	If material enters water, more resources are required.	If material enters water, more resources are required.	If material enters water, more resources are required.
6. Material discharged	Extra safety precautions must be taken for hazardous materials.	Extra safety precautions must be taken for hazardous materials.	Extra safety precautions must be taken for hazardous materials.
7. Weather or aquatic conditions	Possibility for heavy rains, hurricanes and flooding.	Possibility for heavy rains, hurricanes and flooding.	Possibility for heavy rains, hurricanes and flooding.
8. Available remediation equipment	Facility has enough	Rely on OSRO	Rely on OSRO
9. Probability of chain reaction of failures	Low	Low	High
10. Direction of discharge pathway	More resources are required if material heads towards water.	More resources are required if material heads towards water.	More resources are required if material heads towards water.

2.9.2 Discharge Scenarios

PNPP/JWWTP Discharge Planning Volumes	
Discharge Type	Quantity (Gallons)
Small	2,100
Medium	36,000
Worst-Case	(b) (7)(F)

Small-Discharge Scenario

The small-discharge scenario consists of a failure in diesel tank (b) (7)(F) gallons, respectively, of diesel fuel, both of which are located at the JWWTP.

These tanks are located within steel basins with adequate capacity to contain the entire contents of the tanks. In the event of a heavy rain occurring in a small-discharge scenario, however, a spill or leak from either of these tanks has the potential to escape the secondary containment provided, leave the facility property, and enter the DD7 ditch adjacent to the JWWTP.

Medium-Discharge Scenario

The medium-discharge scenario consists of a failure in either tank (b) (7)(F)

The secondary containment at these tanks has adequate capacity to contain the entire contents of the tanks plus freeboard for rain. Any material spilled into the containment area will be vacuumed from the containment into a vacuum truck for disposal or recycling, or the valve draining the containment area will be opened and the containment drained to the process sewer for treatment.

In either of these cases, any leakage or spillage escaping the secondary containment systems will be captured and contained by the process sewer or the dirty, oily water ditches and sent to treatment. In any case, a spill from either of these tanks will be prevented from exiting the facility and will not reach any sensitive areas or drinking water intakes, or cause a chain reaction.

(b) (7)(F)

2.10 Emergency Response Equipment Inspection, Maintenance and Testing

The Emergency Response (ER) Team Leader will assign one individual the responsibility for this program.

This individual is required to sign the inspection form, and will be responsible for any follow-up actions that may be required as a result of the inspection, inventory or test.

The program of maintenance and testing of emergency response equipment involves four activities:

Operability Check

Inventory

Inspection

Maintenance

Equipment inspection and maintenance records are kept on the Emergency Response Critique Form, which is included in **Appendix F**.

2.10.1 Operability Check (semiannual)

This activity is intended to periodically insure the operability of certain items of equipment in the facility's emergency equipment inventory. The designated inspector will check the operability of equipment including safety monitoring equipment, outboard motors, electrical generators and pumps. Any equipment that is electronic, electrical or mechanical will be tested under actual load or use conditions.

During the operability check, the inspector will also perform routine maintenance on the equipment, as needed, such as battery replacements, and oil and filter changes. The inspector will indicate on the inspection form any problems encountered with the equipment and corrective measures taken or needed.

2.10.2 Inventory (semiannual)

The inspector will verify the availability and condition of the variety of supplies, materials, tools, etc, that are maintained on trailers or in storage buildings. The inspector will work from a listing of items that are required to be maintained on the trailer or in the storage area in which he is conducting the count. Any discrepancies in the listing, or item replacement needs, will be noted on the inspection form.

2.10.3 Inspections

Booms and Boats (semiannual)

The inspection of the sorbent booms will involve complete removal of booms from storage and the laying-out of the booms in an area that would not cause damage to the fabric of the booms. The inspector will examine each length of boom closely, making note of any fabric damages or wear, broken or frayed cable, missing weights and damaged connectors. The inspector will also verify the quantity of boom that is supposed to be in storage. Any damages will be repaired, if possible. If the length of boom cannot be economically repaired, the inspector will request replacement.

Boats are supplied and operated by the Port Neches Fire Department, and as such, are responsible for checking for damages, general serviceability and availability and condition of all equipment that is required to be maintained on the boat (fire extinguishers, horn, lighting, floatation devices, etc.) Any damages found will be repaired, and missing or damaged equipment will be replaced or repaired by the Port Neches Fire Department. During this inspection, the boat's current registration will be verified.

Trailers (quarterly)

This inspection will insure that the emergency response trailer and accompanying equipment is ready to go at a moment's notice. As with the other equipment, the inspector will attempt to correct any problems that he may find during the inspection. The trailer's current licensing status will also be confirmed.

2.10.4 Contractor Equipment

The contractors that are listed in this plan are USCG classified OSROs. This classification serves as acceptable documentation of an equipment testing program for the OSRO. If the services of a non-classified contractor were employed, the operator would insure that the contractor had a maintenance program established for its equipment. A copy of the program would be requested and kept on file.

Record Keeping

All maintenance, inspection and testing activities will be documented on the Emergency Response Critique form included in **Appendix F.** Completed forms will be distributed by the inspector as follows:

1) Copy to the ER Team Leader

Copy to the files at the facility where the equipment is maintained

2.10.5 Follow-up Responsibility

For any items that cannot be replaced or repaired during the inspection, test or inventory, the inspector will indicate his need of further action on the inspection form. It will then become the responsibility of the ER Team Leader to take further actions(s) as required.

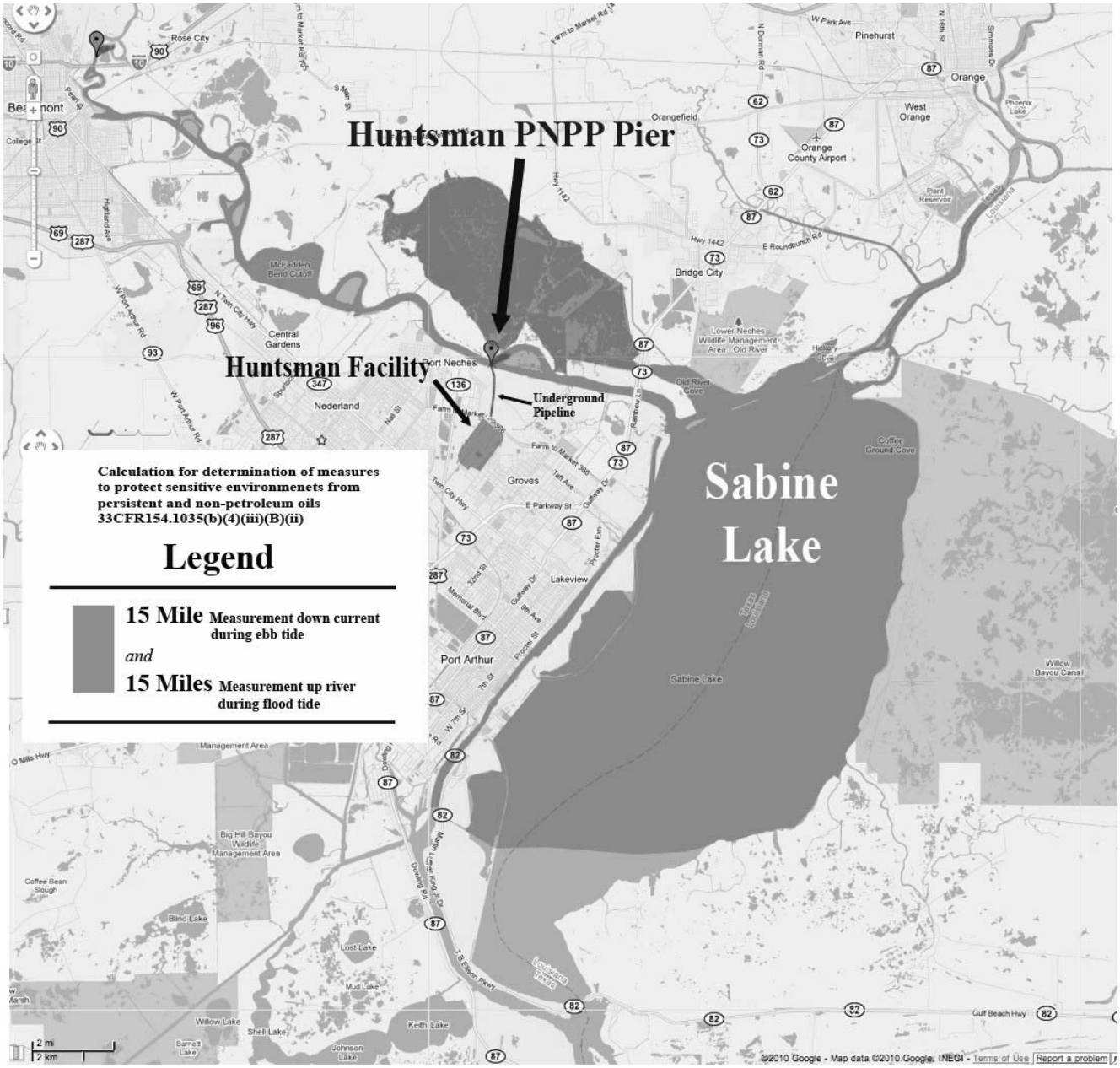
2.11 Vulnerability Analysis

Because of the proximity of Huntsman PNPP facilities to waterways leading to the Gulf, the short length of the route along these waterways to the Gulf, and the difficulty in controlling any spills entering the Gulf, extreme precautions have been taken to prevent any spills of oils or hazardous materials from leaving the facilities. Any spills that do leave the facilities will be prevented from migrating downstream to the Gulf. Therefore, this vulnerability analysis has not been extended past Sabine Pass. This vulnerability analysis is also applicable to Huntsman operated pipelines.

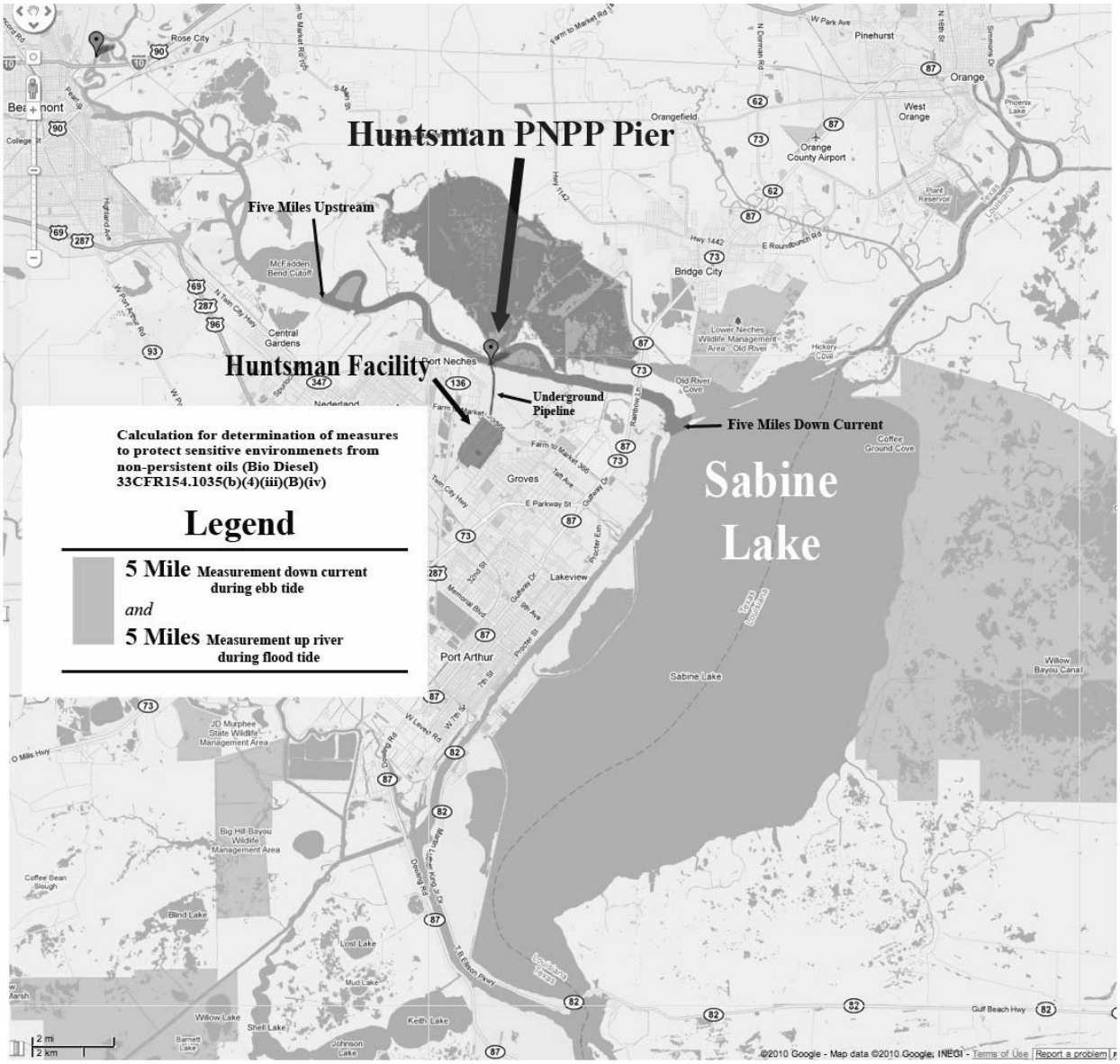
2.11.1 Planning Distance

Planning distances to protect fish and wildlife and sensitive environments in accordance with 33CFR154.1035(b)(4)(iii)(B)

For our non-petroleum oils we opted to consider the area allowed by 33CFR154.1035(b)(4)(iii)(B)(1)(ii) for persistent and non-petroleum oils discharged into tidal waters 15 miles from the facility down current during ebb tide and 15 miles up river during flood tide. The area is depicted below



For Biodiesel fuel, which is a non-persistent oil we opted to consider the area allowed by 33CFR154.1035(b)(4)(iii)(B)(1)(iv) for non-persistent and non-petroleum oils discharged into tidal waters 5 miles from the facility down current during ebb tide and 5 miles up river during flood tide. The area is depicted below



For the Worse Case Discharge Appendix G provides a methodology to handle all of the various response scenarios. Predicting and describing all of our actions is extremely difficult due to the variable nature of the tides winds and current and river current fluctuations.

Responders will:

- Project the flow of oil and water based on the NOAA GNOME or other models and then refer to the sensitivity index map and the accompanying listing of prioritized areas to be protected.

- Refer to the same associated Texas General Land Office response map to implement preventative and protection and clean up strategies based on the priorities from the NOAA Charts.

Our OSRO has assured us that he can implement the protection strategies outlined here and mount a cleanup on all of the sites mention in Appendix G. He indicated he would utilize his resources and those of national subcontracts to mount and effective and aggressive response to any spill.

A process is outlined in Appendix G, which links all of the preventative and response strategies.

Outfall Considerations

The PNPP Facilities have outfalls discharging into two receiving waters: the Neches River and the DD7 ditch. Storm water outfalls from PNPP empty into the DD7 ditch, whereas treated wastewater and storm water outfalls discharge to the Neches River.

In addition, Outfall 002, consisting of storm water and process water, discharges to the Neches River during heavy rains in excess of 10.7 inches. Planning distances and impact analyses for spills into both waterways have been considered.

A planning distance of 42 miles was calculated for spills into the DD7 ditch, into which outfalls from PNPP Facilities empty.

The DD7 ditch proceeds south and west from the complex and widens into DD7 canal before emptying into Alligator Bayou. Alligator Bayou runs adjacently to the PABC Facility in Port Arthur before eventually discharging through various progressively larger waterways into Sabine Pass.

A planning distance of 53 miles was calculated for spills into the Neches River from the PNPP Facilities.

The entire route of the DD7 canal and the Neches River to the Gulf of Mexico is shorter than the planning distance for either waterway.

2.11.2 Identification of Sensitive Areas

PNPP/JWWTP

Environmentally sensitive areas downstream of PNPP and JJWTP Facilities are identified in **Table 4** and **Appendix G.** Environmentally sensitive areas between these facilities and the PABC Facility along the DD7 ditch and from the facilities to Sabine Pass along the Neches River are also listed in **Table 4** and **Appendix G**.There is no municipal drinking water intakes downstream of the PNPP Facilities.

Table 4
HSE Sensitive Areas
Port Neches Performance Products Facilities

Classification	Geographic Location (Direction)	Proximity to Facility	Comments
Population Receptors In Proximity of PNPP Facilities Within 4 Mile Radius			
Dixie Gardens Residential Area	East	0.2 miles	Approximate distance from the fence line
(b) (7)(F) [redacted]			
Groves Residential Areas	East	0.5 miles	Approximate distance from the fence line
Groves Park and Pool	East	0.7 miles	Approximate distance from the fence line
(b) (7)(F) [redacted]			
Park on Neches in Port Neches	Northwest	1.3 miles	Approximate distance from the fence line
(b) (7)(F) [redacted]			
Oak Bluff Memorial Park	North	2.0 miles	Approximate distance from the fence line
Renaissance	East	2.1 miles	Approximate distance from the fence line
City of Port Neches	North	2.2 miles	Approximate distance from the fence line
FINA Refinery	East	2.2 miles	Approximate distance from the fence

Classification	Geographic Location (Direction)	Proximity to Facility	Comments
			line
Unocal Refinery	Northwest	2.7 miles	Approximate distance from the fence line
(b) (7)(F)			
Griffin Park Residential Area	South	3.5 miles	Approximate distance from the fence line
(b) (7)(F)			
Pear Ridge Residential Area	South	3.5 miles	Approximate distance from the fence line
Herman Park (PA)	Southwest	3.7 miles	Approximate distance from the fence line
(b) (7)(F)			

Classification	Geographic Location (Direction)	Proximity to Facility	Comments
(b) (7)(F)			
City of Nederland	West	4.0 miles	Approximate distance from the fence line
Environmental/Economic Receptors Downstream Along Neches River from the PNPP/JWWTP			

Classification	Geographic Location (Direction)	Proximity to Facility	Comments
Facilities to the Entrance of the Intracoastal Waterway			
(b) (7)(F) [redacted]			
Tidally influenced marshes and wetlands	Neches River (north/northeast)	0 to 6 and 8 to 9 miles	High impact
Seawalls, jetties, bulkheads, and revetments	Intracoastal Waterway and Sabine Lake (east)	5 to 7 and 14 to 17 miles	Low impact
Sheltered tidal flats with vegetated margins	Sabine Lake (east/southeast)	7 to 10 miles	High impact
Erosional scarps	Intracoastal Waterway (southeast)	7 to 17 miles	Low impact
Bird rookery	Alligator Bayou (DD7 Ditch)	7 miles	
Marina	Rainbow Bridge, Taylor Bayou at Intracoastal Waterway (South)	7 miles	Rainbow Bridge Marina
Exposed tidal flats	Intracoastal Waterway (east/southeast)	8 to 9 miles	Moderate impact
Prime shellfish grounds	Sabine Lake (southeast)	14 to 18 miles	White shrimp, blue crab, brown shrimp, brackish-water clam, eastern oyster
Recreational area	Pleasure Island, Sabine Lake (south)	14 miles	Pleasure Island Park and Marina
Marina	Pleasure Island (south)	14 miles	Pleasure Island Marina
Boat Launch	Pleasure Island (south)	14 miles	Access to Sabine Lake
(b) (7)(F) [redacted]			

Classification	Geographic Location (Direction)	Proximity to Facility	Comments
	(south)		
Prime fish grounds	Sabine Lake (southeast)	8 to 18 miles	Spotted sea trout, Atlantic croaker, red and black drum, sheepshead, southern flounder, buffaloes
Habitat for rare, threatened, or endangered species	Sabine Lake (south/southeast)	12 miles	Bald eagle and osprey
Bird rookery	Sabine Lake (south/southeast)	12 miles	Rainbow Bridge Marina
Partially exposed bay margins	Pleasure Island (south/southeast)	19 miles	Moderate impact
Public boat ramp	Pleasure Island (south/southeast)	19 miles	Access to Sabine Lake
Municipal disposal site	Off Highway 347 (south)	0.65 miles	City of Nederland

2.12 Oil Spill Contractors

Garner Environmental Services is under contract as the primary provider of oil spill services. Garner is a USCG Certified OSRO and is available 24/7 to respond to a worse case discharge to the maximum extent practicable.

The OSRO and Hutsman's oil spill and hazmat response management team are all adequately trained and will be relied upon for equipment and staffing for at least the first seven days of any response. The OSRO classification also serves as acceptable documentation of an equipment-testing program. For non-classified spill contractors, the operator has insured that such contractors have a maintenance program established for their equipment. Contact information for spill contractors is included in **Appendix B,** while services agreements are included in **Appendix C**.

2.13 Response Zones

The 'facility' is covered under a single response zone for Jefferson County. The DOT, PHMSA regulations require that the operator identify response resources which are available to respond within specified timeframes following discovery of a worst case discharge, or to mitigate the substantial threat of such a discharge. The specified timeframes are as follows:

	Tier 1	Tier 2	Tier 3
High Volume Area	6 hours	30 hours	54 hours
All other Areas	12 hours	36 hours	60 hours

The facility qualifies as a “high volume area”, therefore, all response resources will follow those timeframes specified. OSROs are under contract and committed to respond to all pipeline sections within the 6-hour, Tier 1 timeframe.

Garner Environmental Services is under contract as the primary service provider, and is committed to respond to all pipeline sections within the 6-hour, Tier 1 timeframe.

3.0 Core Plan Elements

3.1 Leak Detection and Emergency Transfer

Failure of manifold, mechanical loading arm and hoses – operators will in*spect all manifolds loading arms and hoses in* use before and during *product movement. Smaller tanks are hand operated so any leaks will be immediately detected.* In the event that a leak is discovered, the operator will first notify the operations team leader and initiate the procedures described in Section **3.3 and** 3.4 Initial Response in Figure 2. *Cease all pumping operations if safety of the product allows, Isolate the leak if possible. If Biodiesel or animal based oils apply absorbents and booms to prevent oil from entering the water and commence response operation in accordance with Section 4 of this manual.* In the event of unintended valve closure or shutdown, the operator will immediately evaluate the condition, to see if an increase in pressure over the Maximum Operating Pressure (MOP) occurred. If such an increase occurred, the line will be shut in, and pressures monitored to determine whether the line integrity has been compromised. If the monitoring of line pressure indicates a potential leak or rupture, the Operations Team Leader will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If an increase over MOP did not occur, the line operation may continue, provided the cause of the valve closure or shutdown has been determined and corrected.

3.2 Tank Overfill –

All operators are trained on detecting leaks and conducting emergency transfers of product. The larger tanks are equipped with automatic tank gauging devices and high liquid level alarms and shut-ins. operators will inspect all tanks in use before and during product movement. In the event that a leak is discovered, the operator will first notify the operations team leader and initiate the procedures described in Section 3.3 and 3.4 and make Initial ***calls t***o persons identified in Figure 2. Cease all pumping operations if safety of the product allows, ***Isolate the leak if possible.*** Next, the operator will gather the appropriate assistance and begin transferring product from the faulty tank (or containment area for piping/valve leaks) into a predetermined vessel of appropriate capacity. ***In the event that the overfill is due to*** unintended valve closure or shutdown, the operator will immediately evaluate the condition, to see if an increase in pressure over the Maximum Operating Pressure (MOP) occurred. If such an increase occurred, the line will be shut in, and pressures monitored to determine whether the line integrity has been compromised. If the monitoring of line pressure indicates a potential leak or rupture, the Operations Team Leader will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If an increase over MOP did not occur, the line operation may continue, provided the cause of the valve closure or shutdown has been determined and corrected.

3.3 Tank Failure –

Whomever witnesses the failure will first notify the operations team leader and initiate the procedures described in Section 3.3 and 3.4 and make Initial calls to persons identified in Figure 2. The Incident commander will consider initiating a "Second Alarm in accordance with Section 4.3.3 due to the concern for impact to the public. Cease all pumping operations if safety of the product allows. Isolate the leak if possible and evacuate the area as appropriate ***as needed. For oil based products cat I – V, evaluate the need for additional earthen containment of the product until the transfer of the product has been completed. Mobilize the OSRO and request additional suitable portable pumping capacity and storage capacity for the product.*** Next, the operator will gather the appropriate assistance and begin transferring product from the faulty tank (or contain***ment area***) into a predetermined vessel of appropriate capacity

3.4 Piping Rupture.

Operators will inspect all piping in use before and during product movement. In the event that a leak is discovered, the operator will first notify the operations team leader and initiate the procedures described in Section 3.3 and 3.4 Initial Response in Figure 2. Cease all pumping operations if safety of the product allows, Isolate the leak if possible. Drain and reroute product through remaining piping. If Biodiesel or plant based oils apply absorbents and booms to prevent oil from entering the water and commence response operation in accordance with Section 4 of this manual. In the event of unintended valve closure or shutdown, the operator will immediately evaluate the condition, to see if an increase in pressure over the Maximum Operating Pressure (MOP) occurred. If such an increase occurred, the line will be shut in, and pressures monitored to determine whether the line integrity has been compromised. If the monitoring of line pressure indicates a potential leak or rupture, the Operations Team Leader will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If an increase over MOP did not occur, the line operation may continue, provided the cause of the valve closure or shutdown has been determined and corrected

3.5 Pipe leaking under pressure

same as above ***and a***fter the problem has been corrected, the line will be evaluated to determine whether or not the design limits were exceeded. If the design limits were exceeded, operators will follow the appropriate procedures outlined in the facility's O&M manual. If pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If the design limits of the line were not exceeded, the pipeline operation will continue providing the safety condition has been corrected.

3.6 Pipe leaking with no pressure same procedures as 3.1.4

3.7 Explosion or Fire

are immediately reported in accordance with the procedures in Section 5.1

3.8 Equipment failure pumps or relief valves

Whomever witnesses the failure will first notify the operations team leader and initiate the procedures described in Section 3.3 and 3.4 and make Initial calls to persons identified in Figure 2. If pressure readings or the rated capacity of the pump or valve has not been exceeded and the problem has been identified and corrected, pump or valve may be restarted with concurrence from the Operations Team Leader. If the design limits of the item were not exceeded, the operation will continue providing the safety condition has been corrected.

All operators are trained on detecting leaks and conducting emergency transfers of product The larger tanks are equipped with automatic tank gauging devices and high liquid level alarms and shut-ins. The smaller tanks and containers are hand operated during delivery or removal and so are manned during operation. In the event that a leak is discovered, the operator will first notify their supervisor. Next, the operator will gather the appropriate assistance and begin transferring product from the faulty tank (or containment area for piping/valve leaks) into a predetermined vessel of appropriate capacity. Personnel will then begin cleanup operations in accordance with this plan. Appropriate emergency notification will be made in response to the degree of spill.

3.9 Abnormal Operating Conditions

(b) (7)(F) [redacted]

Abnormal conditions are unexpected, unintentional, non-emergency events that cause a pipeline system's normal operating limits to be exceeded. In some instances, these abnormal conditions can be the early stages of a pipeline emergency. Abnormal operations may include the following:

Unintended closure of valves or shutdowns

Increase or decrease in pressure or flow rate outside normal operating limits

Operation of any safety device

Any other malfunction of a component, deviation from normal operation, or personnel error which could cause a hazard to persons or property

3.9.1 Unintended Valve Closure or Shutdown

In the event of unintended valve closure or shutdown, the operator will immediately evaluate the condition, to see if an increase in pressure over the Maximum Operating Pressure (MOP) occurred. If such an increase occurred, the line will be shut in, and pressures monitored to determine whether the line integrity has been compromised. If the monitoring of line pressure indicates a potential leak or rupture, the Operations Team Leader will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If an increase over MOP did not occur, the line operation may continue, provided the cause of the valve closure or shutdown has been determined and corrected.

3.9.2 Pressure or Flow Rate Readings Outside Normal Operating Limits

In the event that pressure or flow rate readings are outside of the normal operating limits, the readings will be checked against the design limits of the line. If the readings exceed the design limits, the line will be shut in immediately. Pressure will be monitored to determine that the line integrity has not been violated. If the monitoring of line pressures indicates a potential leak or rupture, the Operations Team Leader will be notified immediately. Once the cause has been determined, a minimum of one hour of pressure monitoring will be completed. If the pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If the readings did not exceed the design limits of the line, operations may continue.

3.9.3 Operation of Safety Devices

If any safety device is triggered, the operator will immediately notify the Operations Team Leader. An investigation will then be conducted to determine the cause of the problem. After the problem has been corrected, the line will be evaluated to determine whether or not the design limits were exceeded. If the design limits were exceeded, operators will follow the appropriate procedures outlined in the facility's

O&M manual. If pressure readings indicate that line integrity has been maintained, and the problem has been identified and corrected, the line may be restarted with concurrence from the Operations Team Leader. If the design limits of the line were not exceeded, the pipeline operation will continue providing the safety condition has been corrected.

3.9.4 Other Malfunctions/Deviations/Personnel Error

The Operations Team Leader will evaluate all other conditions and determine a course of action to be taken.

3.10 Preliminary Assessment

Evaluate safety considerations through the following actions:

Perform air monitoring surveys prior to entering a spill area

Approach area wearing protective equipment including breathing apparatus, if uncertain of product spilled

Keep the public a safe distance from the spill area

Avoid contact with spilled product

Secure the release, if possible to do so in a safe manner (e.g. close valve, turn off pump, blind the flange)

Contain the release with sorbent material, loose dirt, sandbags, or other materials that are available

Be aware of conditions such as high currents, poor visibility, or inclement weather which may cause undue personnel hazards during response operations at dock, shoreline or on vessels.

Identify safety hazards involved in handling spilled oils such as:

Spilled oils which create extremely slippery walking surfaces

Physical hazards associated with spilled product including, but not limited to, skin irritation (from skin contact), diarrhea (from ingestion), eye irritation (from exposure to vapors), dizziness (from inhalation), nausea (from inhalation or ingestion), and asphyxiation (from inhalation)

Determine extent and movement of the spill

Identify sensitive areas and determine protection priorities

3.11 Initial Response

Any person observing or becoming aware of an oil spill of any size must immediately report the incident to the Qualified Individual (QI) or his delegate. In order to save time, the Spill/Release Documentation Form (**Appendix F**) will be completed while discussing the incident. Information not immediately known may be added to the form as it becomes available. Operations personnel are present and capable of initiating notifications on a 24-hour basis through the designated incident reporting system. Notification will take place as indicated in **Figure 2,** Spill Notification Flow Chart. When making these initial notifications, one should attempt to provide the following information:

Name of caller and callback number

Exact location and nature of the incident (e.g., fire, release)

Time of incident

Name and quantity of material(s) involved, or to the extent known (refer to MSDS)

The extent of personal injuries, damage and/or fire, if any

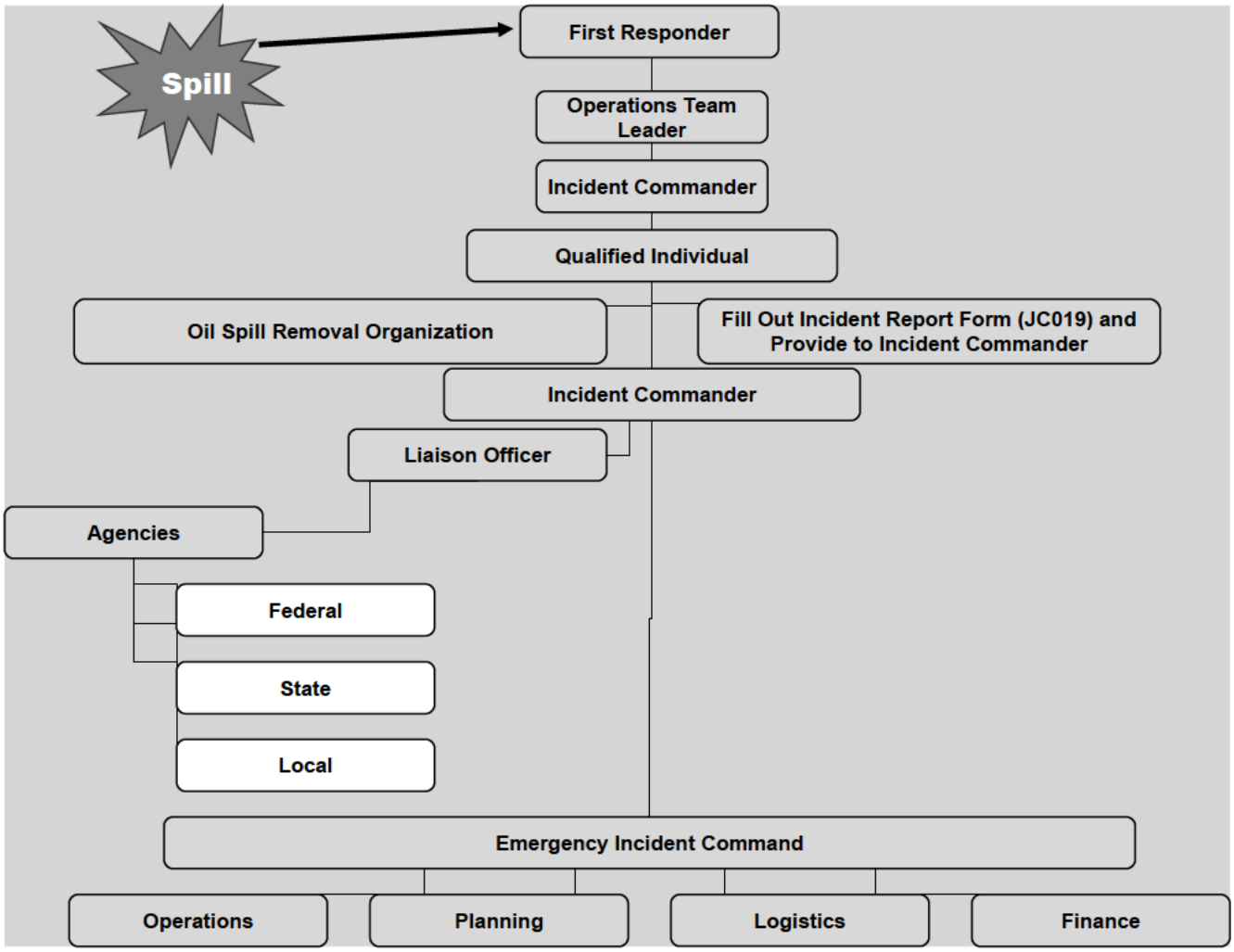
The possible hazards to human health, or the environment, outside the facility;

Body of water affected

Quantity in water (size and color of slick or sheen if the material is lighter than water) or amount released to the atmosphere

Present weather conditions–wind speed and direction, movement of slick or sheen, current/tide;
Potential for fire
Action being taken to control release.
Contact information for all points of notification is included in **Appendix B**.

Figure 2
Spill Notification Flow Chart Prioritize in Order of Importance



3.11.1 Federal Agency Notification Requirements

The Incident Commander will notify the Liaison Officer, who will in turn make all initial and follow-up federal agency notifications on a 24-hour basis. Agencies will be notified in the order established in this section.

National Response Center (NRC) **(800) 424-8802**

The NRC is the clearinghouse for all USCG, EPA, and USDOT oil and chemical spill notifications. Placing a call to the NRC satisfies the notification requirements for each of these agencies. Immediate notification (less than one hour) is required for all discharges of oil sufficient to produce a sheen into navigable waters of the United States, and for all chemical releases in excess of the reportable quantities listed in 40 CFR 302.4. Below are the reporting requirements for each agency, along with the agency's telephone number. It is recommended that a courtesy call be placed to the appropriate agency in order to establish proper lines of communication.

U.S. Department of Transportation **(800) 424-8802**

The following notification requirements apply if NRC has not already been contacted.

The DOT must be notified by telephone if an incident:

Caused a death or a personal injury requiring hospitalization.

Resulted in either a fire or explosion not intentionally set by the operator

Caused estimated damage to the property of the operator or others, or both, exceeding $50,000.

In the judgment of the operator was significant even though it did not meet the criteria above.

Resulted in pollution that violated applicable water quality standards, caused discoloration of the water surface or shoreline, or deposited a sludge or emulsion in the shoreline or beneath the water surface (195.52).

For reportable incidents, the Liaison Officer shall telephone the NRC at the earliest practicable moment, with the following information:

Operator of pipeline and their telephone number.

Name and telephone number of the person reporting the incident.

Location of the accident.

Time of the accident.

Fatalities or personal injury, if any.

All other significant facts known by the operator that are relevant to the cause of the incident or extent of the damages.

Additionally, if additional information is obtained that leads any of the following deviations from the initial report, then an additional report must be called in to the NRC:

An increase or decrease in the number of previously reported injuries or fatalities

A revised estimate of the product release amount that is at least 10 times greater than the amount reported

A revised estimate of the property damage that is at least 10 times greater than the reported property damage estimate

A written report (DOT PHMSA Form 7100.2) is due as soon as practicable but not more than 30 days after discovery of the incident.

Environmental Protection Agency (EPA) Region 6 **(866) 372-7745**

The EPA must be notified through the NRC for all chemical releases (to air, land, or water) deemed

reportable by 40 CFR 302.4 and oil discharges into inland navigable waters of the U.S. sufficient to create a sheen. A written report is not required.

If the facility has discharge more than 1,000 gallons of oil in a single discharge or more than 42 gallons of oil in each of two discharges occurring within any twelve month period, the following must be submitted to EPA within 60 days: name of facility; name of reporting party; location of facility; maximum storage or handling of the facility and normal daily throughput; corrective action and countermeasures that have been taken, including a description of equipment repairs and replacements; adequate description of the facility, including maps, flow diagrams, and topographical maps; the cause of such discharge as including a failure analysis of the system or subsystem in which the failure occurred, additional preventive measures that have been taken or contemplated to minimize the possibility of recurrence and such other information as the EPA may reasonably require pertinent to the Plan or discharge.

United States Coast Guard—MSO Port Arthur **(409) 723-6501**

The USCG must be notified via the NRC for all chemical releases (to air, land or water) deemed reportable by 40 CFR 302.4 and oil discharges into coastal navigable waters of the U.S. sufficient to create a sheen. A written report is not required.

Occupational Safety & Health Administration (OSHA) **(800) 321-6742**

OSHA must be notified by telephone if an accident occurred which caused a death, or three personnel injuries which required hospitalization.

3.11.2 State Agency Notification Requirements

The Incident Commander will notify the Liaison Officer, who will in turn make initial and follow-up state agency notifications. Coordination will take place among the groups listed within this section.

Texas General Land Office **(800) 832-8224**

The Texas General Land Office (GLO) must be notified within one hour of any spill sufficient enough to create a sheen on coastal waters of the state of Texas.

Texas Railroad Commission **(512) 463-6788**

In the event of an accident involving pipeline operations, the operator shall notify by telephone, the Pipeline Safety Section of the commission at the earliest practicable moment following discovery of the incident (within 2 hours).

Texas Commission on Environmental Quality **(800) 832-8224**

The Texas Commission on Environmental Quality (TCEQ) must be notified within 24 hours of any spill which could have the potential to adversely affect human health or the environment.

Any amount of material other than oil spilled to waters of the state which has the potential to alter and/or degrade water quality must be reported to the TCEQ. Reportable quantities are set forth in 40 CFR 302.4, with the exception that no RQ will exceed 100 lbs. if material enters waters of the state. The TCEQ reportable quantity (RQ) for spills on land of oil is 5 bbls. A leak of any size, no matter how small, must be reported if surface and/or ground water quality is affected. Notification after hours of the TCEQ is handled through reporting to the TGLO's Environmental Hotline.

3.11.3 Local Agency Notification

The Incident Commander will notify the Liaison Officer, who will in turn make initial and follow-up notification to the following Local Emergency Planning Committee (LEPC):

Jefferson County LEPC **(409) 722-4371**

3.11.4 Community Notifications

In the event that community notification of a spill is required, the police departments can be reached immediately on a 24-hour basis by dialing "911." Other Community notifications include:

Local Fire Department

Local radio and television stations (for broadcasting messages to the public)

Contact information for community points of notification is included in **Appendix B**.

In the event that public notification of a spill is required, as deemed necessary by the Federal On-Scene Coordinator, the following guidelines will be noted:

The nature and extent of the economic losses that have occurred or are likely to occur

The persons who are likely to incur economic losses

The geographical area that is affected or is likely to be affected

The most effective method of reasonably notifying potential claimants of the designated source

Any relevant information or recommendations submitted by the owner, operator, or guarantor of the designated source

3.11.5 Other Notifications

There are a number of other notifications that must be made if the incident is of a magnitude that requires them, and they include:

OSROs (available 24/7)

Wildlife rehabilitation personnel

Contact information for these points of notification is included in **Appendix B.**

3.12 Establishment of a Response Management System

The Operations Team Leader at the facility will initially be the Incident Commander during any spill. As the incident escalates, more personnel will be called in to form the Incident Command System. The National Interagency Incident Management System (NIIMS) will be used by the facility, in concert with OSROs and federal, state and local agencies. A full discussion on the facility's ICS can be found in **Section 4.0.**

4.0 Response Management System

4.1 General

The Emergency Incident Command Team (IC Team) has been created and organized to plan for and manage response operations for the first seven days of a response. The organizational structure of the Emergency Incident Command Team (IC Team) is based on National Interagency Incident Management System (NIIMS) Incident Command System (ICS). The structure of the Team is modular. A portion of the team may be utilized during a small incident or the entire team may be utilized during a large incident (depending on the size of the environmental impact).

The IC TEAM will develop strategies and priorities for a response, supervise contractors, handle safety and security matters, and provide logistical support for contractor personnel. The IC Team will handle all communications with the media and the public. An IC Team organizational chart is included as **Figure 3**, while specific duties of various divisions of the IC Team are described in **Figure 4**. The Incident Commander (IC) will determine the extent of the IC Team utilization, depending upon circumstances present. IC Team contact information is included in **Appendix B**.

Figure 3
Incident Command Organizational Chart

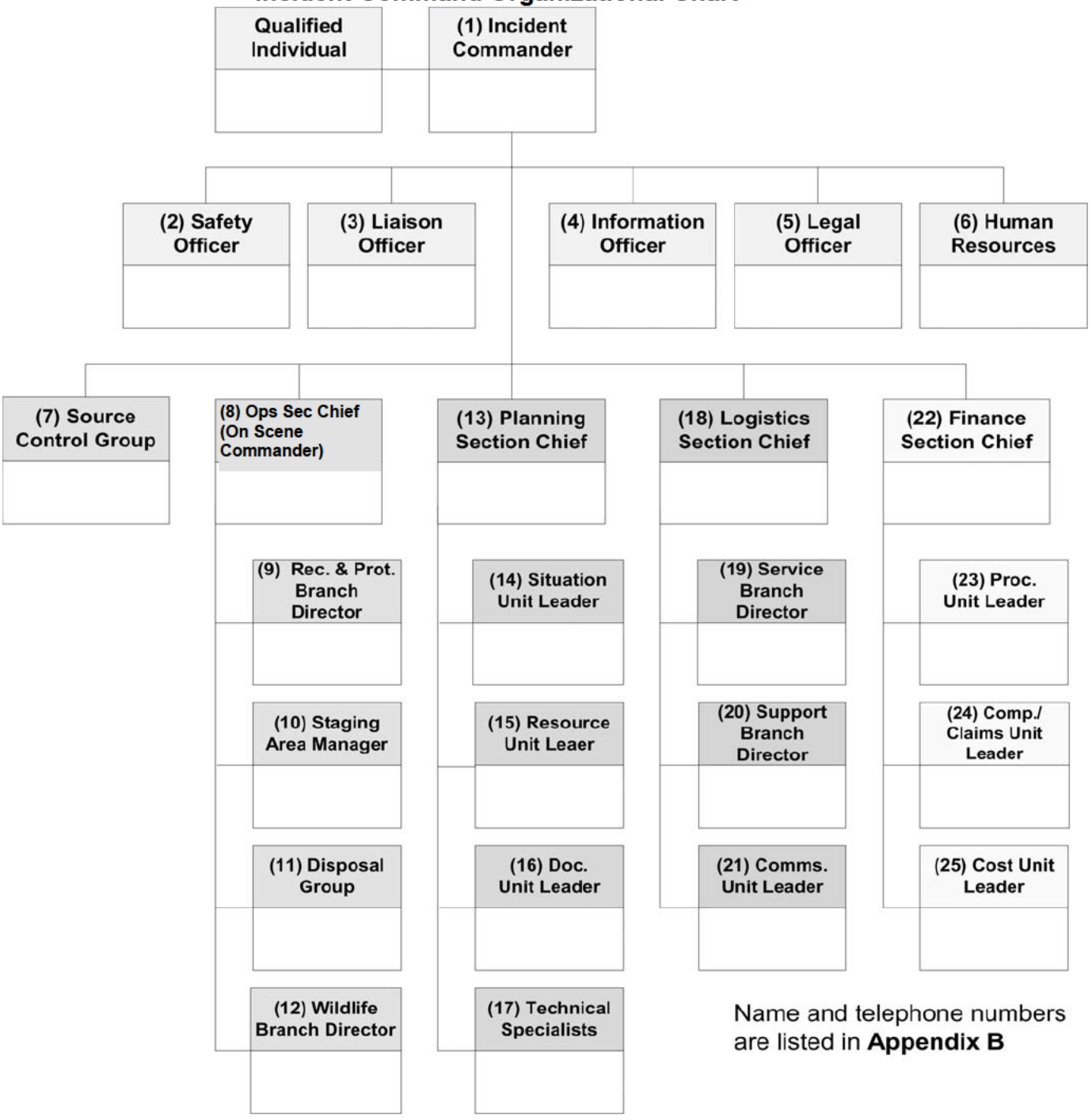
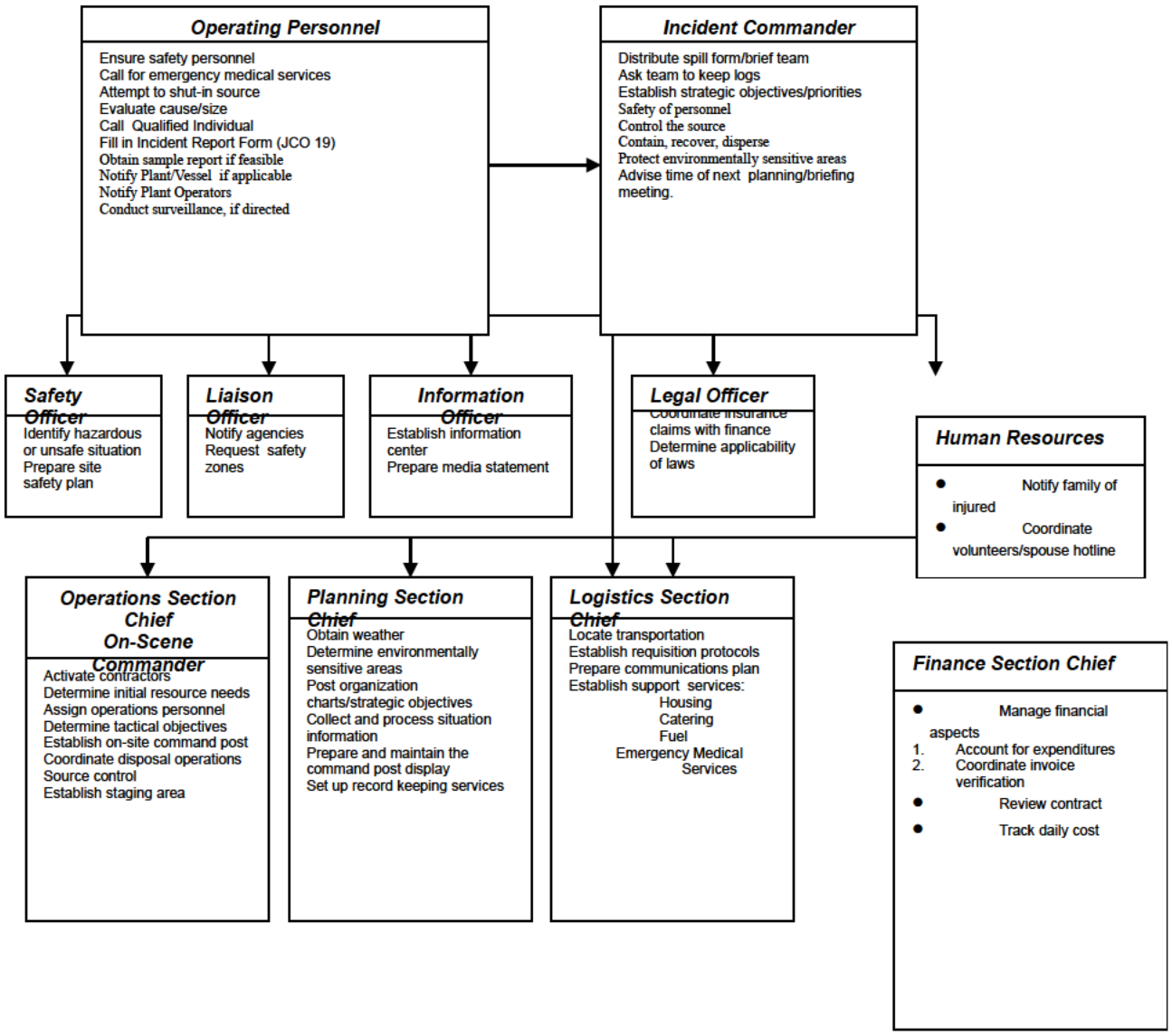


Figure 4

Incident Command Duties



4.2 Interface with Federal, State, and Local Agencies

The Unified Command Structure will be utilized as a method of integrating federal, state, and local agencies with the IC Team. The purpose of this system is to organize the variety of agencies that may be involved in a response into a consistent Team that performs their duties in a concerted, unified effort.

The Unified Command Structure consists of three key on-scene coordinators: Federal On-Scene Coordinator (FOSC), State On-Scene Coordinator (SOSC), and the Incident Commander (IC). These three entities will share decision-making authority as Incident Commanders in the Command center and will consult with each other regarding spill response management issues. The SOSC will coordinate all state and local agencies involved in the response. The facility's Qualified Individual will coordinate all facility personnel and contract activities. **The Qualified Individual will also act initially as the Incident Commander until relieved.**

Depending upon the size and complexity of the incident, additional federal and state agency personnel may integrate into the other functions of the IC Team.

4.3 Command

4.3.1 Duties of the Qualified Individual

The Qualified Individual (QI) will have, in the event of a plant release, an oil spill or threatened oil spill, the following responsibilities and/or authorities as required by 40 CFR Parts 9 and 112:

Responsibility for activation of internal alarms and hazard communication to notify all facility personnel

Notify all response personnel as needed

Identification of the character, exact source, amount and extent of the release, as well as other items needed for notification

Assess the interaction of the spilled material with water and/or other substances stored at the facility and notify response personnel at the scene of the assessment

Assess the possible hazards posed to human health and/or the environment

Assess and implement prompt removal actions to contain and remove the substance released

Coordinate rescue and response actions as previously arranged

Authority to access company funds to initiate cleanup activities

Authority to direct cleanup activities until properly relieved of the responsibility

Ensure that the IC carries out the command activity as required in the ICS

4.3.2 Command Post

The designated command post, the Emergency Operations Center, is located at the Huntsman PNPP Administration Building, Room 2260. An alternate location may be established by the Incident Commander using the Huntsman PNPP Mobile Command Post or other temporary Mutual Aid Site.

4.3.3 Information

Internal Communication

Information flow is vital to response operations. During spill response, each supervisor will have the capability to communicate with other supervisors and the command post over VHF oil spill frequencies. Communication with the Unified Command and contractors at the site can be conducted on the marine band and/or over portable radios. Each supervisor is required to check in with their designated section chief every two hours. Section chiefs will report to Unified Command during hourly briefings. This will allow the facility to establish and maintain communications during the entire spill response. The

Communications Unit Leader will also establish a communications plan and call out additional communications equipment, as needed. Cellular phones and/or VHF/UHF handheld radio communication systems will be utilized in case of a failure of the land line systems. The facility will exchange radios with the OSRO and/or IC Team during the incident. This will enable the IC Team to communicate with spill response Team members by radios tuned to designated frequencies.

The emergency call out will be activated in one, two or three alarms, depending on the situation:

First Alarm calls are for a limited emergency response.

Second Alarm constitutes an advanced mobilization of emergency response resources, when authorized by the Incident Commander or On-Scene Commander.

Third Alarm constitutes a total mobilization of emergency response resources, when authorized by the Incident Commander or On-Scene Commander.

Guidelines determining first, second or third alarm responses are the following:

First Alarm

In a First Alarm situation, available facility personnel and First Alarm responders will attempt to resolve the incident safely.

The First Alarm requires:

The Incident Commander establishes a Command Post and staging area.

The Incident Commander initiates the Incident Command System and sizes the system relative to the magnitude of the incident.

All responders initially report to a designated area that will be determined by the Incident Commander for accountability.

Second Alarm

A Second Alarm emergency is declared by the Incident Commander or On-Scene Commander when First Alarm responders are unable to resolve the incident safely and/or the public may be impacted by a PNPP facility emergency.

A Second Alarm requires:

The Incident Commander or On-Scene Commander initiate assistance from the Supplemental Fire Brigade, Port Neches/Port Arthur Fire Department, Ambulance Service and the PNPP Rescue Team.

Sabine-Neches Chiefs Association personnel are selectively alerted for standby by the Port Neches Fire Department Communications Van, and additional Air Management Support personnel are on scene.

All responders report to a designated area that will be determined by the Incident Commander for accountability.

Third Alarm

A Third Alarm emergency is declared by the Incident Commander or On-Scene Commander when First and Second Alarm responders are unable to resolve an incident safely and/or the public may be impacted by the PNPP facility emergency.

A Third Alarm requires:

The Incident Commander or On-Scene Commander initiate total mobilization of resources and initiates MUTUAL AID from the Sabine Neches Chief Association by calling (409) 838-6371 and requesting personnel and / or equipment needed to resolve the incident.

Selected representatives from the Sabine-Neches Chiefs Association are requested

on-site.

All responders report to a designated area that will be determined by the Incident Commander for accountability.

Community Notification

In the event that community notification of a spill is required, the police or sheriff's department will be notified for assistance by calling 911. In the event that public notification of a spill is required, as deemed necessary by the FOSC, note the following guidelines:

The nature and extent of the economic losses that have occurred or are likely to occur

The persons who are likely to incur economic losses

The geographical area that is affected or is likely to be affected

The most effective method of reasonably notifying potential claimants of the designated source

Any relevant information or recommendations submitted by the owner, operator, or guarantor of the designated source

Media Notification

Accurate reporting of activities to the news media and to the general public is necessary during an oil spill. The primary objective is to ensure that all reports are timely, factual and represent the company's position fairly and accurately.

For larger spills with more media interest, it may be necessary to seek assistance from the FOSC. Under Unified Command, a Joint Information Center (JIC) may be established. The Information Officer will make every reasonable effort to cooperate with the media and provide necessary facilities to accommodate their needs.

It may become necessary to make scheduled press releases during highly publicized, sensitive, or incidents of great public concern. The press should be consulted to establish a schedule. It may be beneficial to arrange for a single contact point with the press which can then provide information to all other press organizations. Public statements will contain the following type of information as appropriate:

Nature, time, and location of the incident and other facts that are not in dispute

Time, place, and number of people injured or killed

Current status of the incident

Name of contact for more information

Steps the company has taken or has firm plans to take to contain, control, or handle the spill (if facts are not in contention)

Whether or not danger is present

Whether or not there have been any evacuations or power disruptions

State that it is the company's policy to prevent pollution of the sea, coastline or inland waters (whichever is appropriate) and to minimize danger to the environment

Containment and cleanup experts on the scene or on the way

Type of oil spilled

Volume, if known (or estimates as provided to regulatory agencies)

Movement of wind, current, and weather which may affect movement of the spill

Equipment and manpower directed to efforts

Special efforts to protect property or wildlife

Concurrence that appropriate agencies have been (are being) fully notified and/or informed

Statements regarding the following should be avoided:

Liability for a spill

Speculation regarding the cause and size of spill

Dollar amounts of damage and/or containment and cleanup

Estimates of time required to complete cleanup

Promises that property, environment, etc. will be restored to normal

Statements regarding appropriateness of response by other companies or governmental agencies

Names of injured or dead until next of kin have been notified

Discussion of previous incidents

Providing information directly to members of the impacted community, free of the filtering and potentially distorting effect of the media is critical to public understanding of the incident response. Community relations may include scheduling of public meetings, preparing speeches, and coordinating public activities with public officials and protocol personnel. An Initial Media Release form is located in **Appendix F**.

Plans for Families of Employees

In the event of a large incident, with numerous responders, the Information Officer will recommend adding a Human Resources Officer to the IC Team. This person will be the point of contact for families of employees. Personnel will be tracked through logs. There will be official check in logs at the incident which will support personnel accountability. Supervisors must maintain a Unit Log indicating names of personnel assigned in their unit. If necessary, Human Resources will contact the appropriate team leader to relay a message to the employee.

4.3.4 Safety

All spill response activities pose varying dangers to responders. An important consideration in any response activity is to protect the health and safety of the responders and the general public. To do this requires that the chemical and physical hazard associated with each operation to be assessed and methods implemented to prevent or reduce harm to responders. Safety considerations are an input to every activity that is undertaken and are an outcome of each response activity. For example, an outcome of identifying a specific chemical may cause changes in safety requirements. Each response organization must have an effective health and safety program including medical surveillance and health monitoring, appropriate safety equipment, standardized safety procedures, and an active training program.

Potential impacts to the health and safety of the public sector must be identified and controlled through early countermeasures to prevent additional emergency situations from compounding the incident.

The Safety Officer is responsible for monitoring and assessing hazardous and unsafe situations and developing measure for assuring personnel safety. The Safety Officer will correct unsafe acts or conditions through the regular line of authority to stop or prevent unsafe acts when immediate action is required. The Safety Officer maintains awareness of active and developing situations, ensures the preparation and implementation of the Site Safety Plan, and includes safety measures in each Incident Action Plan. The following is a list of additional responsibilities:

Identify hazardous or unsafe situations associated with the incident by ensuring the performance of preliminary and continuous site characterization and analysis which shall include the identification of all actual or potential physical, biological, and chemical hazards known or expected to be present on the site

Participate in the planning meetings to identify any health and safety concerns inherent in the operations daily work plan

Review Incident Action Plan for safety implications

Exercise emergency authority to stop and prevent unsafe acts

Investigate accidents that have occurred within incident areas

Ensure the preparation and implementation of the site specific Health and Safety Plan (HASP) in accordance with the ACP and State and Federal OSHA regulations. The HASP shall at a minimum address, include, or contain the following elements:

Health and safety hazard analysis for each site task or operation

Comprehensive operations work plan

Personnel training requirements

PPE selection criteria

Site specific occupational medical monitoring requirements

Air monitoring plan for area personnel

Site control measures

Confined space entry procedures (only if needed)

Pre-entry briefings (tailgate meetings), initial and as needed

Pre-operations health and safety conference for all incident participants

Quality assurance of HASP effectiveness

Assign assistants and manage the incident safety organization

Review and approve the medical plan

Maintain unit/activity log

A Site Safety Assessment and Job Safety Analysis (JSA) form is located in the **Appendix F**.

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4.3.6 Personnel Assignments/Description of Duties

Site Manager-Qualified Individual

- Report to field command post if appropriate.
- Obtain briefing from Incident Commander.
- Assist at the scene where needed.
- Assist Incident Commander and Operations Section Chief in determining contributing operational conditions, review isolation options, etc.
- Relocate to the facility Emergency Operations Center if magnitude or conditions of the emergency require that the center be established.
- Assist operations personnel as needed.
- Maintain unit integrity, control and accountability of personnel
- Keep Incident Commander informed of position progress and needs.
- Assure that all response units operate only to the level of experience/training and not overextend themselves in difficult situations.
- Notify and brief senior management.
- Check again with Incident Commander and Source Control Group on status. Beyond this point, unless incident situation is getting worse, try to evaluate which product lines will be affected and for how long. Contact Corporate Headquarters and apprise them of the situation.
- Maintain log of activities.

Incident Commander

The Incident Commander is responsible for all emergency activities arising as a result of the incident including the development and implementation of strategic decisions involving the approval and release of all resources. The Incident Commander will be the Person-in-Charge (PIC) (and the Qualified Individual (QI) for oil spills and cleanup operations and will have the authority to commit funds necessary to clean up the spill in affected area(s).

- The Incident Commander will authorize the activation of the command post and mobilization of each team.
- The Incident Commander will review, evaluate, and document the IC Teams' tactical efforts during the response and revise the plan as needed.
- The responsibilities of the Incident Commander during the response effort include the following:
- Establish a Command Post.
- Activate internal alarms and hazard communication systems to notify all facility personnel.
- Notify all response personnel, as needed.
- Identify the character, exact source, amount and extent of the release, as well as the other items needed for notification
- Activate appropriate elements of the Incident Command System.
- Conduct Briefings.
- Restrict access to incident zones.
- Initiate incident investigation procedures
- Conduct transition briefings with Section Chiefs.
- Brief the Federal, State, and local regulatory agencies and media as required,
- Establish the Emergency Operations Center if magnitude or conditions of the emergency require.
- Assess the interaction of the spilled substance with water and/or other substances stored at the facility and notify response personnel at the scene of that assessment.
- Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion).

- Assess and implement prompt removal actions to contain and remove the substance released.
- Coordinate rescue and response actions as previously arranged with all response personnel.
- Use authority to immediately access company funding to initiate cleanup activities.
- Direct cleanup activities until properly relieved of this responsibility.
- Declare all clear and end emergency response activities when appropriate.
- Maintain log of activities.

Safety Officer - Manager, Health & Safety, or Designee

1. Report to field command post if appropriate.
2. Obtain briefing from Incident Commander.
3. Assist at the scene where needed.
4. Relocate to the facility Emergency Operations Center if the magnitude or conditions of the emergency require that the center be established.
5. Discharge Duties of the Safety Officer:

The Safety Officer will develop measures to ensure the safety of personnel during the incident response. Although the Safety Office may exercise emergency authority to stop or prevent unsafe acts when immediate action is required, the Safety Officer will correct unsafe acts or conditions through regular lines of authority. If, for any reason, the Safety Officer cannot perform during the response effort, the alternate person is a designated Safety Specialist. The responsibility of the Safety Officer during the response effort includes the following:

- Report to Command Post.
- Designate exclusion zones of the incident area.
- Industrial Hygiene specialists will identify and plan for toxic and/or biological hazards that may be present at a response site.
- Obtain briefing from Incident Commander and/or Operations Section Chief.
- Assist in identifying safety hazards for response team at incident site.
- Implement site safety plan procedures. Determine the level of respiratory protection necessary. Establish and manage the incident area exclusion zone by ensuring air monitoring is conducted as necessary, only authorized personnel enter the exclusion zone, proper PPE and decontamination procedures are used. Review assignments and incident activities with other health and safety personnel.
- Ensure that the Incident Commander is advised of all changes during the incident.
- Coordinate activities with adjacent Fire Brigade Attack Teams and Attack Groups.
- Report special occurrences or events such as accidents or illnesses to the Incident Commander. Provide information on status of resources.
- Direct Security needs as required to protect workers and the public.
- Maintain log of activities.

Liaison Officer – Environmental Manager, or Designee

1. Report to field command post if appropriate.
2. Obtain briefing from Incident Commander.
3. Assist at the scene where needed.
4. Relocate to the facility Emergency Operations Center if the magnitude or conditions of the emergency require that the center be established.
5. Discharge Duties of the Liaison Officer:

The Liaison Officer will coordinate with local emergency management officials if it is determined that the incident will impact neighboring facilities or communities. The responsibilities of the Liaison Officer during the response effort are as follows:

- Establish liaison with local emergency management officials when authorized by Incident Commander.

- Establish communications link with Jefferson County Emergency Management.
- Determine need for alerting public and police of roadblocks and public evacuation.
- Determine need for Security Manager and request security activities needed to protect personnel and property from loss or damage during the incident response.
- Maintain log of activities.

Information Officer

1. Report to field command post if appropriate.
2. Obtain briefing from Incident Commander.
3. Assist at the scene where needed.
4. Relocate to the facility Emergency Operations Center if the magnitude or conditions of the emergency require that the center be established.
5. Discharge Duties of the Information Officer:

The Information Officer is responsible for the accurate and timely disbursement of information to the public and the media. The responsibilities of the Information Officer are as follows:

- Establish Information Center for press releases and public information. This location will be determined by the Incident Commander.
- Assist the Incident Commander and Huntsman Management with press briefings.
- Monitor media reports and submit corrections to media personnel in a timely manner if corrections or clarifications are needed.
- Notify gate security guard to direct all press representatives, government officials, other inquiries to Information Center.
- Assign assistant to direct Media Representatives to Information Center.
- Maintain log of activities.

Legal Officer

1. Report to field command post if appropriate.
2. Obtain briefing from Incident Commander.
3. Assist at the scene where needed.
4. Relocate to the facility Emergency Operations Center if the magnitude or conditions of the emergency require that the center be established.
5. Discharge Duties of the Legal Officer:

The Legal Officer is responsible for the accurate and timely evaluation of incident related information and events. The responsibilities of the Legal Officer are as follows:

- Check with Incident Commander to determine need to provide assistance to Human Resources Officer regarding injured employees or others.
- Coordinate insurance claims with finance personnel.
- Determine applicability of laws to incident related information and events.
- Coordinate with technical staff regarding environmental damage claims, response actions and formal regulatory agency actions.
- Maintain log of activities.

Human Resources Officer

1. Report to field command post if appropriate.
2. Obtain briefing from Incident Commander.
3. Assist at the scene where needed.
4. Relocate to the facility Emergency Operations Center if the magnitude or conditions of the emergency require that the center be established.
5. Discharge Duties of the Human Resources Officer:

The Human Resources Officer is responsible for the accurate and timely disbursement of information to the public and the media. The responsibilities of the Human Resources Officer are as follows:

- Check with Incident Commander to determine need to provide assistance to injured employees and family.
- Families of the injured employees will be appropriately notified. If necessary, arrangements will be made to transport family members of the injured personnel to the hospital.
- Make verification of notification of next of kin on any injuries before releases to news media.
- The need to assist an employee's financial status may be justified because of the incident. Investigate each request for welfare funds and submit recommendations to the Plant Manager.
- Maintain log of activities.

Operations Section Chief – (On-Scene Commander)
The Operations Section Chief will manage all operations of the incident response. The responsibilities of the Operations Section Chief during the response effort include the following:

- Report to incident scene.
- Obtain briefing from Incident Commander.
- Assess response needs
- Brief Incident Commander as conditions change.
- Direct response personnel activity (Fire Brigade/HazMat Team, etc.).
- Request resources fro the Incident Commander as needed.
- Direct Mutual Aid Groups(s).
- Identify tactics to accomplish IC objectives and supervise section operations.
- Evaluate section activities and adjust actions as required.
- Keep IC informed of section activities through regular progress reports. Advise command immediately of significant changes in section conditions, particularly those involving the ability to complete a mission, hazardous conditions, accidents, collapse, etc.
- Monitor welfare and safety of section personnel.
- Request additional resources as needed.
- Establish staging area and relay location to Incident Commander and Logistics Section Chief.
- Establish the staging area layout and method of accountability for personnel and equipment entering or leaving the staging area.
- Post sign for identification of the staging area and for traffic control.
- Request maintenance service and fuel for equipment in the staging area.
- Demobilize the staging area as directed by the Incident Commander.
- Staging Area Manager provide transportation and support vehicles for use during the incident
- Provide maintenance, gasoline and diesel fueling for emergency equipment.
- Ensure all facility hot and start work permitting procedures are enforced before initiating repair of damaged equipment
- Maintain log of activities.

Operations Manager – Unaffected Units
The Operations Manager-Unaffected Units will report to and organize the EOC and manage unaffected process operations applicable to the incident response. The Operations Manager -Unaffected Units must keep the Incident Commander and/or Operations Section Chief advised of operational activity that could impact the emergency response. The responsibilities of the Operations Manager – Unaffected Units during the response effort are as follows:

- Obtain initial briefing from the Incident Commander to determine the nature of the incident and which area is affected. Attempt to obtain a preliminary estimate of extent of damage to affected

area, also to rest of facility

- Coordinate with the Instrument & Electrical (I&E) specialists to determine if communication networks are still functioning. Determine need for personnel for de-energizing or safe guarding electrical equipment. Assign personnel to repair, if possible, communications to areas in which networks are not functioning. Call out appropriate facility or contract personnel for re-establishing communications, emergency or otherwise.
- Contact each unaffected operating area to see if they are intact and can continue operations or if emergency shutdown action is required.
- Contact Source Control Group to determine to what extent utilities services are involved. This should include electrical, steam, instrument air, and water (raw, fire, service water). Check to determine if flare system is intact and serviceable.
- After above contacts are made, determine which additional facilities, if any should be shut down and relay these instructions to the Incident Commander.
- Check to determine if track mobiles are needed to move tank cars from affected area. If track mobiles are not operating, contact Logistics Section Chief for winch trucks to start moving tank cars. If additional assistance is needed, request Contract Rail Switching Service be notified for assistance.
- Determine if affected unit operation is static or improving.
- Collect and validate technical information within the affected area.
- Determine operational restrictions within the affected area relative to normal and emergency shutdown.
- Develop suggested technical priorities.
- Provide analysis information as requested.
- Check again with each unaffected area, this time requesting a more detailed report on their situation, especially regarding stability of utilities service in their area and any problems in cross-facility transfer lines for raw materials or products.
- Evaluate the extent the incident will affect raw materials receipts ability and contact appropriate personnel to request they notify suppliers of situation.
- Establish contact with affected area to get first hand report of damage extent, if it is available. This information will be needed to make appraisal to determine if any additional facility operations should be limited or shut down.
- Again, contact each unaffected area, brief them on status of facility operations, and advise them of situation in affected area as it may impact their area operations.
- Maintain log of activities.

Planning Section Chief

The Planning Section Chief will identify, plan and advise on environmental matters that may arise from the incident. The responsibilities of the Planning Section Chief during the response effort are as follows:

- Determine wind direction and velocity and any change that occurs during incident; determine need for alerting facility personnel.
- Evaluate incident for environmental impact at facility and on surrounding community.
- Contact environmental contractors and put on standby as needed.
- Ensure that all applicable notifications are made. Notify federal, state and local regulatory agencies.
- Put vacuum trucks on standby.
- Dispatch environmental personnel to the incident scene as requested by Operations Section Chief.
- Monitor runoff and releases as well as subsequent impact with the facility and nearby communities.
- Sample and characterize residues of wastes for proper disposal. Prepare waste disposal plan.
- Maintain log of activities.

Logistics Section Chief
The Logistics Section Chief will procure facilities, services, emergency equipment, additional personnel and material to support the emergency response effort. The responsibility of the Logistics Section Chief during a response effort is as follows:

- Implement plan for organization of logistics strategy.
- Identify service and support requirements for planned and anticipated operations.
- Coordinate with vendors for additional resources.
- Manage communications equipment and procedures used during the incident response. Establish communications links as requested by Incident Commander and Operations Section Chief.
- Coordinate efforts with Mutual Aid groups in procuring personnel and/or equipment.
- Respond to requests for resource assignments to emergency operations.
- Establish procedures for emergency medical services with the Incident Commander as described in the medical emergency procedures.
- Determine level of emergency medical needs.
- Obtain medical aid and transportation for injured and ill personnel as needed.
- Activate the medical staff.
- Activate procedures for major medical emergencies.
- Evaluate the need for medical supplies.
- Prepare medical reports.
- Communicate with area hospitals.
- Maintain log of activities.

Finance Section Chief
The Finance Section Chief will manage all financial aspects of an incident. The responsibilities of the Finance Section Chief during a response effort are as follows:

- Account for financial expenditures and ensure that financial commitments are properly documented.
- Coordinate invoice verification with contractors and provide daily cost tracking.
- Review contracts to ensure billings are in accordance with purchase documents.
- Provide financial and cost analysis information as requested.
- Ensure compensation and claims functions are included in financial accounting activities.
- Provide financial input for demobilization planning.
- Maintain log of activities

Source Control Group
The Source Control Group will assess the damage to determine to what extent utilities services are involved. This should include electrical, steam, instrument air, and water (raw, fire, service water). Check to determine if flare system is intact and serviceable.
Marshal all repair equipment and manpower for the incident response. The responsibilities of the Source Control Group during the response effort are as follows:

- Determine extent of the emergency; check condition of utilities for continued serviceability and the availability of maintenance resources.
- Check with Incident Commander as to the need for maintenance workers in the affected area.
- If needed, call out additional maintenance and utility workers.
- Establish communications with Staging Area Manager to direct called out maintenance workers to maintenance staging area.
- Maintain log of activities.

4.4 Operations

In-plant emergency conditions are managed in accordance with the Port Neches Performance Products Process Emergency Procedures developed for plant process units. Process unit stability or shutdown will be performed in a controlled manner and chemical or oil release response operations will be conducted with the following objectives.

4.4.1 Operational Response Objectives

Continuously assess personnel safety
Secure or isolate the source
Contain the product
Protect sensitive areas
Recover product
Rehabilitate wildlife and resources
Clean impacted areas
Coordinate response actions
Document response
Customize response organization
Think ahead and anticipate needs

4.4.2 Assessment/Monitoring

Conduct over flights (photos, videos, air eye)
Classify the type and size of spill
Acquire samples
Determine chemical and physical properties of spilled material
Obtain on-scene weather forecast (12, 24, 48, and 72-hour)
Track oil movement or projected movement
Continuously assess human health and environmental concerns
Determine extent of contamination

4.4.3 Planning Considerations/Protection Priorities

Resource constraints, time constraints, and various response constraints limit the amount of areas that can be protected during a major oil or HAZMAT spill. The following list provides a prioritization of types of areas that must be protected during an incident.

1) Public Health
Storm drain Inlets
Public drinking water intakes
Public utility water intakes
Threatened and Endangered Species
Habitat and Species Concentrations
Designated wildlife refuges and game management areas
Wildlife concentrations (which may vary seasonally)

Vegetated wetlands and shoreline
Public oyster seed grounds
Commercial and recreational fisheries management areas
Coastal restoration projects
Other Public Lands
Cultural and Historical Sites
Exposed Tidal Flats
Shell beaches and rip rap
All other beaches
Sheltered Rocky Shores and Sea Walls
Private Recreational Areas and Facilities
Marinas
Private and Industrial Raw Water Supplies

4.4.4 Procedures for Implementation of Tactical Plan

Maximize protection of response personnel
Deploy boom immediately to prevent the spread of pollution and to protect the environment
Boom off sensitive areas
Deploy boom to corral a drifting slick and divert it to a suitable collection point
Maximize on-water containment and recovery operations
Handle wastes to minimize secondary environmental impacts

4.4.5 Procedures for Mobilization of Resources

A major consideration during a spill is the organization and direction of the transportation of manpower, equipment, and materials used in response operations. The QI will work with local authorities (state police) to establish land routes which will expedite the movement of personnel, equipment, materials and supplies to the Staging Area and waste products from the Staging Area. The facility will utilize status boards to coordinate all equipment, personnel and materials mobilized to the spill site. Equipment will first be mobilized from the OSRO warehouse to the Staging Area. The Staging Area Manager will direct which equipment will be delivered to which Division/Task Force. Mobilization of Resources can be completed within Tier I, II, and III time requirements.

4.4.6 Sustained Actions

Response operations will need to be managed 24-hours a day, seven days a week until the operation is complete. The facility's Emergency Team members are available to be cascaded in to support response operations. Once the initial emergency stage of the spill situation has transformed to the sustained action stage, the response management structure will develop more prolonged mitigation and recovery action strategies.

4.4.7 Inshore/Nearshore In-Situ Burning

In-situ burning as a spill response method may provide a means to remove the oil from the impacted area without resorting to mechanical cleanup methods, which may be destructive or impossible to carry out. In-situ burning may minimize both short term risks of further impact of the spilled oil, and long term risks of persistent toxicity to Marsh plants and biota. In the event of a release of a spill in a wetland area, in-situ burning is considered an effective tool in response for remediation of oiled coastal wetlands. The following

guidelines and checklist should be considered when trying to determine proper methods to remediate a hydrocarbon release from the PNPP facility.

Environmental Considerations:

It must be determined if cleanup is necessary or desirable. A consultation with a biologist, botanist or ecologist should be considered in assessing options remediation options and alternatives. Cleanup in a wetland appears to be justified when oil can be removed with minimum impact, when other natural resources (such as migratory birds) are at high risk of being oiled, or when unassisted recovery is likely to be very slow.

Operational Considerations

The type and condition of the oil must be sufficiently combustible. Very heavy or weathered oils may not support combustion. Some type of wicking agent might be necessary. State/local air quality regulations for burning must be followed and the appropriate agency contacted. Burning may be restricted between 9:00am to 5:00pm. It is also recommended to call the FAA with proposed burn times and locations.

Safety Considerations

Because of the intense heat, the smoke plume usually rises several hundreds to several thousands of feet. It then levels off and is blown by the wind in a narrow, and often meandering band while dissipating. After that it moves about according to weather conditions at the time. Some parts of the plume occasionally dip back down toward the surface but the majority of the smoke usually stays well up in the air. If the wind is blowing away from a populated area it is conceivable that a burn could be conducted immediately adjacent to the area. However, if the wind is blowing toward a populated area there must be reasonable assurances that people will not be exposed to excessive concentrations of pollutants. Concentrations of small particulates in the smoke plume dissipate and are generally within the standard 150 micrograms per cubic meter of air, averaged over 24 hours, within one to three miles from the burn. In most cases, three miles from populated areas is considered to be a reasonably safe distance in case the plume dips down to land.

If the risk is deemed unacceptable in-situ burning should not be done. Burning must be safe and practical in light of spill status and spill source stabilization. Make sure burning is compatible with mechanical cleanup operations. It is assumed that the responsible party has implemented a site safety work plan with a section specifically addressing in-situ burning. Personnel conducting the burn should be trained, provided with the necessary protective equipment, and monitored as needed.

4.4.8 Nearshore Dispersant Use

The Federal Regional Response Team VI (RRT 6), in accordance with the “National Oil and Hazardous Substances Pollution Contingency Plan” (NCP), has preauthorized the use of dispersants but is limited to spills or releases in water depths of 10 meters or more and at least three nautical miles from the nearest shoreline. In accordance with the National Contingency Plan, RRT 6 dispersant pre-approval authority is given only to the Federal On-Scene Coordinator (FOSC).

This dispersant pre-approval is designed to provide for the timely use of dispersants along with mechanical techniques and *in-situ* burning for offshore oil spill response. No single response method is 100% effective, thereby establishing a need to consider the use of all available methods from the start of the spill response. Initially, the assumption needs to be made that all three methods (mechanical, *in-situ*

burn, and dispersants) may be used and then adjustments are made to that assumption as information concerning the spill is received by the FOSC.

The objective of the RRT 6 FOSC Dispersant Pre-approved Guidelines and Checklist is to provide for meaningful, environmentally safe, and effective dispersant operation. The programmed checklist approach allows the FOSC to quickly arrive at a logical “GO/NO GO” decision. This gives the dispersant operation the opportunity to begin in a timely manner that is consistent with attempting to maximize the effectiveness of dispersant use as a countermeasure to reduce the impact of oil spills.

In the document, “The RRT 6 Dispersant Pre-approval Overview”, the FOSC Dispersant Use Checklist and the FOSC Dispersant Use Flowchart define the dispersant pre-approval requirements. If the dispersant pre-approval requirements are not met, the request for use of dispersant must follow the approval process as specified in the RRT 6 Regional Contingency Plan Subpart H Authorization. The only requirement for dispersant product selection is that the dispersant must be included on the NCP Product Schedule and considered appropriate by the FOSC for existing environmental and physical conditions.

4.4.9 Termination and Follow-up Actions

Cleanup will be conducted as thoroughly as possible, but will be terminated when, in the opinion of the Incident Command (IC):

There is no detectable oil in the water

Further removal actions would cause more environmental harm than remaining oil

Cleanup measures would be excessive in view of their insignificant contribution to minimizing a threat to the public health, welfare, or the environment

Actions required to repair unavoidable damage resulting from removal activities have been completed

The Operations Section Chief will develop a plan of demobilization and assist units to ensure that an orderly, safe, and cost-effective demobilization of personnel and equipment is accomplished.

General demobilization considerations for all personnel are the following:

Complete all work assignments

Brief subordinates regarding demobilization

Complete and file required forms and reports

Follow check out procedures provided by the IC

Evaluate performance of subordinates prior to release

Return communications equipment or other non-expendable supplies

Report to assigned departure points on time or slightly ahead of schedule

The IC, in cooperation with federal or state On-Scene Coordinators, as necessary, will terminate the response. The IC will convene a meeting to summarize the incident, and a complete report will be developed within 180 days. This report will record the incident as it developed and will identify, in detail, the actions taken, resources committed, and any problems encountered. The IC will include a recommendation outlining any suggested changes of policies or procedures. The format of this report will be as follows:

Summary of Events-a chronological narrative of all events, including:

The location of the oil discharge

The cause of the discharge or the release

The initial situation

The organization of the response, including State participation

The resources committed

Content and time of notice to natural resource trustees relating to injury or possible injury to natural resources

Comments on Federal or State damage assessment activities and efforts to replace or restore damaged natural resources

Treatment/disposal/alternative technology approaches pursued and followed

Public information/community relations activities

Effectiveness of Removal Actions-a thorough analysis of removal actions taken by:

The company

State and local agencies

Federal agencies and special teams

Contractors, private groups, and volunteers (if applicable)

Difficulties Encountered-a list of problems affecting response, including problems of governmental coordination.

Recommendations-IC recommendations, including at a minimum:

Means to prevent a reoccurrence of the discharge or release

Improvement of response actions

Any recommended changes in the plan

Enclosures to the report:

Maps, charts, photographs, or diagrams of the areas affected by the spill

Radio, telephone, and other applicable logs

Photographic documentation of the response, arranged chronologically

Any other documentation necessary to supplement the information in the IC report

4.4.10 Medical Needs of Public and Responders

If a non-responding employee or member of the general public is in need of medical attention due to an exposure to the spill, the following steps will be taken:

A person witnessing a medical emergency will respond by calling 911

Assess the situation

Determine condition of injured person

Render first aid if possible

If the victim is able, have him or her prepare an appropriate accident report. If the victim is unable, the Safety Officer or his or her designee will fill out the report.

Contact the Command Post to arrange for transportation to medical facility, if needed

Interview all witnesses

Transport victim

Send accident report with the victim and forward copy to the Safety Officer

Document the facts of the accident investigation with photos, written information, etc.

Phone numbers for hospitals, medical centers, other medical assistance, and transportation are listed in **Appendix B**.

4.4.11 Oil Characteristics

The following oil types handled by the facility are described as follows:

Group 1—Very light refined products

(For example, gasoline, naphtha, solvents, Avgas 80/100)

Very volatile and highly flammable (flash point near 0°–73°F/40°C)

High evaporation rates (complete removal by evaporation is likely)

Low viscosity (spread rapidly to a thin sheen)

Specific gravity less than 0.80 (floats on water)

High acute toxicity to biota (can cause localized, severe impacts to water-column and intertidal resources)

Will penetrate substrate, causing subsurface contamination

Recovery usually not attempted because of fire hazards

Exclusion booming of sensitive areas must be completed rapidly

Group 2—Diesel-like products and light crude oils

(For example, no.2 fuel oil, jet fuels, kerosene, marine diesel, West Texas crude, Alberta crude)

Moderately volatile (flash point varies from 100°–125°F/40°–65°C)

Light fractions (up to two-thirds of the spill volume) will evaporate

Low to moderate viscosity (spread rapidly into thin slicks)

Specific gravity of 0.80–0.85, API gravity of 35–45, so slicks will float on the water surface except under turbulent mixing conditions

Moderate to high acute toxicity to biota; product-specific toxicity related to type and concentration of aromatic compounds in the water-soluble fraction

Will coat and penetrate substrate (some subsurface contamination)

Stranded oil tends to smother organisms

Containment/recovery from the water is most effective early in the response action

Group 3—Medium oils and intermediate products

(For example, North Slope Crude, South Louisiana Crude, intermediate fuel oils, lube oil)

Moderately volatile (flash point higher than 125°F/52°C)

Up to one-third will evaporate

Moderate to high viscosity

Specific gravity of 0.85–0.95 and API gravity of 17.5–35

Variable acute toxicity, depending on amount of light fraction

Can form stable emulsions

Will coat and penetrate substrate (heavy subsurface contamination likely)

Stranded oil tends to smother organisms

Group 4—Heavy crude oils and residual products

(For example, Venezuela crude, San Joaquin Valley crude, Bunker C, # 6 fuel oil)

Slightly volatile (flash point grater than 150°F/65°C)

Little product loss by evaporation (usually less than 10-15%)

Very viscous to semi-solid (may become less viscous when warmed in sunlight)

Specific gravity of 0.95-1.00, and API gravity of 10-17.5 (so slicks will float initially and sink only after weathering or incorporating sediment)

Low acute toxicity relative to other oil types

Form stable emulsions

Little penetration of substrate likely

Oil stranded on shorelines tends to smother organisms

Recovery from the water and shoreline cleanup difficult during all stages of response action

Group 5—Very heavy residual products

(For example, Very heavy # 6 fuel oil, asphalt, asphalt cutter stock, atmospheric reduced crude)

Little product loss by evaporation (usually less than 10%)

Very viscous to semi-solid (may become less viscous when warmed in sunlight)

Specific gravity > 1.0 and API gravity of less than 10 (oil can float, be neutrally buoyant, or sink depending on the properties of the specific oil and the salinity of the receiving water)

Low acute toxicity relative to other oil types

Form stable emulsions

Little penetration of substrate likely

Oil stranded on shorelines tends to smother organisms

Recovery from the water and shoreline cleanup difficult during all stages of response action.

Group B—Vegetable oils and animal fats

(For example, Chicken fat, Soy oil, Corn oil)

Low to moderately volatile (flash point higher than 539.6°F/282°C)

Up to one-third will evaporate

Moderate to high viscosity

Specific gravity of 0.85–0.95

Low initial toxicity, long term products of degradation are more toxic

Can form stable emulsions

Will coat and penetrate substrate (heavy subsurface contamination likely)

Stranded oil tends to smother organisms

(Group B oils have an emulsification factor and dissipation characteristics similar to Group 3 medium oils and intermediate products)

Shallow Water/Shoreline Protection

Every effort must be made to protect environmentally and economically sensitive areas. The following methods will be employed for protection of these areas:

Open water boom—In areas of shallow water, it may be possible to collect or corral the oil with open water boom and take it to deeper water or low-current areas that have better skimmer access and higher recovery rates.

Bottom-seal boom—This boom is designed for deployment in very shallow water where a traditional boom may become fouled on the bottom during low water levels. This boom's special features allow it to conform to the substrate, so that it can continue to act as a barrier to oil during changing tides or lower water levels. Shallow water boom is effective in higher-current areas because the shallow skirt minimizes the drag in the current.

Sorbent Boom—Sorbent boom is designed primarily to absorb oil although it can act as a protective measure against thin oil sheens under very quiet water conditions. Snare boom (pom-poms tied onto a line) is effective as a sorbent of more viscous oils under higher wave and current conditions. In any current, sorbent boom can contain only the thinnest sheens. When used with conventional booms, sorbents can be placed outside of the boom to pick up small amounts of escaping oil, or inside the boom to absorb small amounts of contained oil.

Inland Boom—Inland boom is the smallest conventional boom and is designed for deployment in very shallow water; as the draft is only 6-12 inches. It is normally deployed in more protected waters where there is little or no wave action.

Spills in Natural Environments

The response techniques, or combination of techniques, employed in a spill are dependent upon the product spilled, quantity, location, response time, weather conditions, responder capability, and availability of response equipment. Response strategies have been described in terms of environmental sensitivity for a range of shallow water and inland habitat types.

Sound cleanup decisions depend on accurate information about the types of habitats that the oil affects, the degree of oiling, and the location of oiling. *Characteristic Coastal Habitats, Choosing Spill Response Alternatives*, illustrates typical physical and biological attributes of North American coastal habitats at risk from oil spills. The text describes each habitat and discusses both how oil is likely to behave there and considerations for treating oil. Portions of this document covering oil spill removal techniques have been included in **Appendix E** while a digital version (.pdf) of this document is available at the following Web site:

http://response.restoration.noaa.gov/book_shelf/911_coastal.pdf

The Characteristic Coastal Habitats collection is a useful aid for training people who will be participating in cleanup assessment as part of an environmental unit within the Incident Command System. It also complements NOAA's Shoreline *Assessment Manual and Shoreline Assessment Job Aid.*

4.5 Waste Management

Oil spill cleanup by mechanical recovery will involve the further handling of recovered oil and oiled materials. These will be directed to the appropriate reclamation/disposal site. Normally, the waste generated from a mechanical recovery operation will be classified as a non-hazardous waste. In rare instances where it is suspected that extraneous substances have been introduced into a spill, it is appropriate to test the recovered oil for hazardous waste characteristics (ignitability, reactivity, corrosivity, and toxicity). Oil/debris disposal procedures can meet Tier I, II, and III time requirements utilizing equipment and manpower from the OSROs listed in this plan.

4.5.1 Oil/Water/Debris Separation

The different types of wastes generated during response operations require different disposal methods. Waste will be separated by material type for temporary storage prior to transport. **Table 5** lists some of the options available for separating oily wastes into liquid and solid components. The table also depicts methods that may be employed to separate free and/or emulsified water from the oily liquid waste.

Table 5
Separation Methods for Different Types of Wastes

Waste Type	Separation Methods
Liquids	
Non-emulsified oils	Gravity separation of free water
Emulsified oils	Emulsion broken to release water by: Heat treatment Emulsion breaking chemicals Centrifuge Filter/belt press

Solids	
Oil mixed with sand	Collection of liquid oil leaching from sand during temporary storage Extraction of oil from sand by washing with water or solvent Mechanical sand cleaner Removal of solid oils by sieving
Oil mixed with cobbles, pebbles or shingle	Screening Collection of liquid oil leaching from shoreline material during temporary storage Mechanical sand/gravel cleaner Extraction of oil from shoreline material by washing with water or solvent
Tar balls	Separation from sand by sieving

4.5.2 Temporary Storage of Recovered Oil

Oil recovered by skimmer(s) is transferred to portable tanks. It is important to ensure temporary storage devices are of sufficient size to allow continued operations. If storage capacities are not sufficient, additional equipment could be utilized including rubber bladders, roll off boxes, and mud tanks.

Skimmer tanks allow for gravity separation of the oil from the water. The separated water is transferred through a hose and discharged forward of the recovery pump. This method is called “decanting”. This process is vital to the efficient mechanical recovery of spilled oil because it allows maximum use of limited storage capacity, thereby increasing recovery operations. Approval must be obtained from federal and state agencies prior to decanting.

Oiled debris collected requires specific handling. Contaminated materials will be placed in leak proof, sealable containers on the recovery vessels and transported to appropriate facilities for processing, recycling, or disposal.

Recovered oil will typically contain substantial quantities of water and debris. Excess water, sand, and other materials greatly increase the quantity of waste and its associated cost for transportation, processing, and disposal. To remedy this, different methods can be employed at the cleanup site to separate oiled debris from excess materials. Using screens, filters, conveyor systems, and settling tanks, oil/water mixtures can be drained from debris and collected in temporary containers for further treatment.

Clean sand and shoreline materials can be separated from oiled materials and returned to the shoreline. Not only is this cost effective from an operations perspective, it also provides an efficient means of returning clean, excavated material back to the shoreline as a restorative measure.

Oil spills often occur in remote sites that are some distance from transportation routes and storage facilities. In these situations, temporary on-scene storage arrangements may be required. Oil may be stored in Baker tanks, tank trucks, 55-gallon drums, bladders, or empty fuel storage tanks. Such tanks permit decanting of water from the oil. If suitable containers are not available, oily waste may be temporarily stored in pits dug in the soil (FOSC and SOSC will need to be contacted prior to doing this). These pits will need to be lined with plastic sheeting to prevent oil leakage and soil penetration. To minimize contamination of surrounding areas from leaching oil, storage sites should not be located on or adjacent to ravines, gullies, streams, or the sides of the hills, but rather in areas with minimal of slope.

Temporary storage methods discussed in this section can be conducted within appropriate Tier I, II, and III time requirements utilizing equipment from USCG certified OSROs.

4.5.3 Recycling

Whenever possible, recovered oil should be returned to the production system for recycling. A secondary means of handling recovered oil may be through a commercial oil reclaimer. When utilizing this secondary option the oil will be classified as nonhazardous and must be shipped to an approved reclaimer.

4.5.4 Disposal Regulations

Oiled Materials-If these materials have not contacted extraneous substances, they will be classified as nonhazardous and will only be disposed of at the owner/operator's approved nonhazardous waste disposal site. In some cases it will be appropriate to seek permission from the appropriate state agency to burn the oiled material.

Oil and oily wastes that are contaminated or excessively weathered will require transport to an approved disposal site. Any transport or disposal of material that is considered hazardous waste must follow the requirements of the Resource Conservation and Recovery Act (RCRA).

Regulatory Guidelines:

Only state licensed hazardous material haulers are used to transport recovered oil. These licensed waste haulers must have a US EPA ID number and a state transporter ID number.

The Uniform Hazardous Waste Manifest must be filled out by the waste generator for each truckload of oily wastes hauled away for disposal.

When completing the manifest, the owner/operator is listed in the manifest as the generator. The manifest will need to be signed by the designated representative, and marked with the statement: "This material is being disposed of by the owner/operator as part of a response action in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300)".

Recovered waste oil must be properly packaged and labeled prior to transport in accordance with 40 CFR 262.30.

All wastes shipped off-site for disposal must be transported in compliance with applicable regulations. These include the RCRA regulations in 40 CFR 262-263, the DOT Hazardous Materials Regulations in 49 CFR 171-178, and any applicable state regulations. Ensure shipments of waste collected during spill cleanup activities are transported in adequate containers to eliminate secondary releases during transport. If the nature of the waste precludes packaging in the required container, the Incident Commander will request emergency exemptions from the regulations following procedures outlined in 49 CFR 107.

Only state-certified disposal sites will be used by waste haulers, unless recovered oil can be sent for recycling

Unit personnel must track the Uniform Hazardous Waste Manifest and retain appropriate records per 40 CFR 262.40. Unit personnel will receive a signed copy of the manifest from a designated disposal facility within the specified time limits. The owner/operator must retain copies of Hazardous Waste Manifests in unit files for at least three years.

A Waste Inspection Form and Tracking Log (refer to **Appendix F**) will be completed during the time of the spill.

4.5.5 Disposal Transportation and Designated Sites

Transportation of oil and oily waste may be accomplished by a tank truck, or a vacuum truck. Trucks certified for waste oil transport will be utilized. Oil or oily debris recovered from a spill site will only be disposed of at authorized locations.

4.6 Incident Documentation

The Incident Commander (IC), or person designated by the QI, will coordinate the post-accident review in conjunction with federal, state, and local officials, as well as with others familiar with the incident. This

investigation will begin after the source of the incident has been corrected, eliminated or repaired, and the facility has been declared safe by the IC. The IC will take the following steps during a post-accident investigation:

Obtain all data, information, and reports pertaining to the accident, leak, or incident

Interview in person or by telephone each person knowledgeable of the accident

Analyze the response of the emergency shutdown system, relief valve, or any other safety device to determine if the facility controls reacted in a safe manner. Determine if design changes to the existing safety systems or added protection are necessary.

Review the response of operations personnel to see if procedures and training were adequate or if changes are warranted.

Evaluate other potentially dangerous situations which could have occurred and if the response of personnel and safety systems would have accommodated those situations had they occurred.

Prepare recommendations as appropriate for changes to:

Design of facility

Operating procedures

Training

Communications

Emergency response plans and procedures

The IC will prepare and issue a written report to all facility/pipeline procedure holders with any changes deemed appropriate.

The IC will verify the following checklist concerning waste disposal

Check list

- Has the RP determined if the material being recovered is a waste or a reusable product? (40 CFR 262.11)
- Has all recovered waste been containerized and secured such that there is no potential for further leakage while the material is being stored? (40 CFR 262.34)
- Has the RP identified each of the discrete waste streams? (40 CFR 262.11)
- **** (Attach a list of the waste streams)**
- Has a representative sample of each waste stream been collected? (40 CFR 262.11(A)(c)(1))
- Has the sample been sent to an approved laboratory for the appropriate analysis, i.e., hazardous waste determination?
- Has the RP received an appropriate waste classification and waste code number for the individual waste streams? (40 CFR 262.12(a))
- Has the RP received a temporary EPA identification number and Texas generator number, if they are not already registered with the EPA or TCEQ? (40 CFR 262.12(a))
- Has the RP obtained pre-approval for the temporary storage locations? 40 CFR 262.10 (b)/

262.34

- Has the RP retained the services of a registered hazardous waste transporter, if the waste is hazardous? (40 CFR 262.12(c)
- If the waste is non-hazardous, is the transporter registered?
- Is the waste being taken to an approved waste disposal site? (40 CFR 262.12(c))
- Has the RP maintained documentation that the waste/product arrived at the designated facility, i.e., manifest or bill of lading.
- Is the waste hazardous or Class I non-hazardous?
- If the waste is hazardous or Class I non-hazardous is a manifest being used? (40 CFR 262.20)
- If the waste is a Class I non-hazardous is a manifest being used? (40 CFR 262.20)
- **** According to Texas Regulations a manifest must be used.**
- Is the manifest properly completed? (40 CFR 262.23)

5.0 Other Incidents

5.1 Fire

5.1.1 Response

For all fires, personnel will take the following actions:

- Determine where the fire/explosion has taken place
- Notify everyone of the location
- Account for all personnel in the area of the fire
- Dial “55” (only if needed after utilizing the Emergency Call Out System) and request assistance from the local fire department
- Rescue stranded/injured personnel (if safe to do so)
- Assess fire and determine:
- Class of fire
- Appropriate extinguishing agent (Product MSDS are maintained at the operations office)
- Methods to prevent the spread of the fire
- Necessary personnel and fire fighting methods
- Prevent environmental pollution
- Limit damage to the facility
- Establish communications

Facility employees are provided training to respond only to incipient fires. If an employee encounters a fire at a stage that can be controlled by means of a readily accessible fire extinguisher (e.g. small 30 pound dry chemical), the employee may elect to attempt to extinguish. Instructions for proper use are located on the extinguishers and are as follows:

- Remove fire extinguisher from holding rack
- Place upright on the deck and grasp handle with one hand
- Remove hose nozzle from retainer
- Position fire extinguisher
- Remove ring pin
- Activate extinguisher
- Grasp nozzle
- Approaching the fire from the upwind side, squeeze nozzle and direct spray at base of flame with side to side motion

If an attempt to extinguish the fire is unsuccessful, then the “55” call is initiated.

5.1.2 Prevention

The purpose of the Fire Prevention Plan is to inform personnel of the physical hazards of chemicals handled on-site, how physical and health hazards are communicated at the facility, and the importance of following proper work procedures and company policies to prevent the occurrence of fires.

It is important to control potential ignition sources when handling flammable materials. These potential ignition sources include, but are not limited to, welding and burning operations, open electrical circuits,

static electricity, smoking, and accumulation of combustible waste materials. The following policies are established in order to prevent potential ignition hazards:

No flammable or combustible liquids will be allowed to escape uncontrolled, outside of its designated container.

Buckets will be used to contain residue when breaking or disconnecting flanges or hoses.

Product residues will be properly contained in marked and labeled drums and properly sealed to prevent evaporation.

All welding and burning operations and operation of internal combustion engines or electrical equipment inside firewall areas, docks, or near flammable/combustible materials will require the issuance of a hot work permit prior to beginning the tasks.

The Operator will be responsible for preventive maintenance and repairs to all electrical and emergency equipment, to include: electrical motors, cords, EPC's, etc., and fire equipment.

All new installations will be reviewed by the Technical Services Representative, the Maintenance Manager, and the Safety Department to ensure compliance with appropriate codes and standards.

Frequent inspections of the operations will be conducted.

Flammable and combustible materials will be disposed of in proper receptacles, and not allowed to accumulate and present a hazard to employees or the facility.

Hoses will be capped to prevent vapor releases or potential spills.

All grounding leads will be attached prior to transfer operations.

Leaks from fittings will be reported to the appropriate department so repairs can be made or equipment put out of service.

Rags and other hazardous debris (pigs, absorbents) will be contained in hazardous waste drums positioned throughout the facility.

5.2 Gas Release

In the event of a gas release, the person making the discovery will take command of the situation until relieved by a more qualified employee. The situation will be addressed in the following order:

1) Call “55” or “911” for assistance, if applicable
2) Determine which gas line is leaking
    - Do not enter a gas cloud; make determination from a safe place
    - Use appropriate PPE or SCBA before proceeding
3) Eliminate all ignition sources
    - Do not operate any motor vehicles/engines
    - No smoking
    - Extinguish flame in fired heaters
    - Stop all cutting and/or welding
    - Establish fire watch (up wind)

Depressure the leaking line at the facility ASAP

If the leak is close to public housing or facilities, evacuate the public and deny entry to the leak areas

Notify appropriate superintendent

Notify one of the Qualified Individuals

Notify appropriate gas transmission company (if applicable)

Notify the National Response Center

Once the gas line is bled off to a pressure no longer releasing gas to the atmosphere, terminate the emergency response and go to a cleanup/repair action

5.3 Personnel Injury

The facility management will most often seek a medical clinic or emergency health care facility in the event of an illness or injury. Contact information for local medical facilities and providers is included in **Appendix B**. Depending on the severity of the injury, management personnel may elect to transport the victim to the medical provider. A person witnessing a medical emergency should respond by dialing "55" with the following information:

Name of caller

Type of emergency and condition of employee

Location

Call back phone number

The respondent should render first aid (if properly trained), and if necessary, transport the victim to a safe location. If the victim is able, have him/her prepare an accident report. If the victim is unable, the facility manager will fill out this report. Witnesses will be interviewed and facts of the accident will be documented on the report. Post-casualty urinalysis and alcohol breath tests (ABT) will be authorized and administered to victims in the case of a pipeline incident. Any injured party choosing not to accept medical treatment or post-casualty drug screens must be documented "refusal of treatment" on the report. Personnel Injury files are copied and forwarded to the corporate claims office. Medical information and updated, payments to employees and medical providers will also be processed through this office.

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5.5 Natural Disasters

5.5.1 Hurricanes

Huntsman, LLC maintains a Hurricane Procedure as part of the Port Neches Performance Products Process Emergency Procedures. Hurricanes are tropical cyclones with torrential rains and sustained winds of 74 miles per hour or greater which blow in a counter-clockwise direction around a center "eye". Hurricane winds can exceed 155 miles per hour and severely affect areas hundreds of miles inland. As hurricanes approach the coast, a huge dome of water called a storm surge can impact the coastline, causing major damage to everything in its path. Hurricanes also spawn tornadoes and can cause severe flooding from heavy rains. Hurricanes are classified into five categories based on their wind speeds, central pressure, and damage potential.

Category	Wind Speed (MPH)	Storm Surge
I	74-95	4'-5'
II	96-110	6'-8'
III	111-130	9'-12'
IV	131-155	13'-18'
V	Greater than 155	Greater than 18'

5.5.2 Non-Hurricane Season–(December 1 to May 31)

Date	Action
	Review local Coast Guard, port authority and county emergency management agency hurricane plans and develop/update operations specific guidance.
	Purchase any missing materials required to cover windows and doors into buildings, and provide tie downs for items stored outside.
	Identify/correct any plan deficiencies.
	Identify hurricane preparation actions and assign personnel to these responsibilities
	Conduct training/drills ensuring that personnel get to walk through their hurricane preparation duties and handle any materials and tools associated with them.
	Inspect the facility(s) for plan compliance.
	Identify and make arrangements for off-site storage selected equipment that is not needed and would be safer, stored away from the facility, on higher ground if possible. If inside storage is available and chosen, the building must be substantial enough to withstand severe storms. A firm, advance commitment should be obtained for this kind of storage since it is likely to be at a premium when a storm approaches. Outside storage must include secure tiedowns for lightweight materials.

5.5.3 Hurricane Season–(June 1 to November 30)

Date	Action
	Advise employees of entry into hurricane season. Make hurricane preparedness handouts available, particularly for employees who are new to the region. Local publications provide articles on hurricane preparedness may be reproduced locally.
	Provide guidance to employees and their families on selection of emergency supplies and how to prepare homes for hurricanes. As soon as a hurricane watch or warning is set for an area, supplies will instantly become scarce.
	Survey all inside storage areas and identify locations that can be used to accommodate equipment and drums of oil or other chemicals that are routinely kept outside.
	Refresh stocks of consumable hurricane supplies for use at the facility.
	Review tank fill height table to ensure data is current and minimum fill levels can be reached for all category hurricanes.
	Develop a list of actions that must be taken to prepare the facility(s) for a hurricane and for recovery following storm passage. Assign personnel to the identified tasks and post the list so that employees will know what is expected of them.
	Prepare/update a list of employee home phone numbers and addresses. Supervisors should have this information.

5.5.4 Hurricane Landfall in 48 Hours

Date	Action
	Regularly monitor weather reports. Be prepared to accelerate the pace of preparedness if it is likely that a hurricane condition is going to be upgraded.
	Contact all customers and ascertain product needs. Pay particular attention to police, hospital, and emergency services. Advise customers that all deliveries will stop at Condition I, when the storm is 12 hours from landfall.
	Remind all employees that in off-duty time they should be safeguarding their homes and purchasing emergency supplies. Request employees to consider where they will ride out the storm and advise you of their intentions and locations
	Review employee assignments for hurricane preparations and update as situations change.
	Tanks with product—If an additional new product is available fill each tank to the minimum level necessary to prevent buoyancy in the event of flooding. If time and supply permits, fill each tank to capacity. If additional product is not available, transfer appropriate product among tanks to prevent buoyancy. If minimum levels cannot be reached through product transfer, add water bottoms. Skim and pump down any oil/water collection basins.
	Identify hoses and related equipment, which will not be needed for transfers. Drain, blind, and remove hoses and related equipment to inside storage.
	Ensure availability/readiness of materials needed to protect buildings; for example, shutters, plywood, sand bags, etc.
	Lighter equipment should be tied down securely.
	Identify all files, records, computer equipment, etc. that must be protected or removed to safe storage. Assess the exact storm conditions and the resources available to accomplish the process of securing office equipment and files. Begin the process now if conditions warrant but, in any event, don't delay beyond the point where Hurricane Condition II is initially set. Make backup tapes and/or disks of computer files, as necessary.
	Survey the facility(s) and identify all items that will be moved to inside storage. Begin moving items to inside storage as conditions dictate. Ensure availability of tie-downs for materials that will not be placed in inside storage space.
	Establish a 24-hour dedicated phone line for all personnel to call and verify personal safety and return to work assignment.

5.5.5 Hurricane Landfall in 24 Hours

Date	Action
	Tanks that are empty and clean must have manhole plates removed or openings cut in them to allow rising water to enter, thus preventing tank buoyancy.
	Continue to fill tanks with product
	Charge all spare radio and cellular phone batteries.
	Begin process of securing/protecting windows and doors with shutters or plywood. Remove awnings, signs, or decorative items likely to become missile hazards.
	Complete securing and/or removal of files, records, equipment etc. to safe storage.
	Complete moving equipment and materials to inside storage. If inside storage is insufficient, change any remaining outdoor stacks of drums to single stacks and lash together as appropriate.
	Survey the grounds to remove debris.
	Fill fuel/cargo tanks of all vehicles not needed for present operations and move to secure area. Leave vehicles locked and in gear with the brake engaged.
	Prepare a list of locations and contact phone numbers where employees intend to be during the hurricane. Provide guidance to employees to contact the dedicated manned phone line as soon as practical after storm passage, by any means. The Operations Team Leader will reach agreement with subordinates on the best way to contact each other. Provide employees with a list of cellular phone numbers that are or will be issued and the name of the person holding each phone. All supervisors must be made aware of the importance of finding out the status of the facility(s) and plans for returning to work, as soon as possible following storm passage, so that this information can be passed to every person.
	Develop and publish a plan that identifies employees who will be required to complete Condition I tasking before the facility is completely secured.

5.5.6 Hurricane Landfall in 12 Hours

Date	Action
	If the decision is made by management to shut down the facility, cease all commercial transfer operations and initiate facility shutdown.
	Terminate filling of storage tanks. Close and secure all tank valves.
	If applicable, close all roof hatches and ensure roof drains of floating roof tanks are open.
	Make final survey of all grounds and buildings. Secure items found loose or remove them to protected storage.
	Drain, blind, and remove all remaining hoses and related equipment. Close and secure all valve heads; cover as appropriate.
	Complete securing of windows and doors. Close all mechanical louvers.
	Close and secure all tank valves on any installed lube oil tanks. Ensure all tanks have enough product to prevent buoyancy.
	Fill fuel/cargo tanks of all remaining vehicles and move to secure area.
	Drain, blind, and tie down all load rack loading arms. Close and secure all valves on rack. Cover all valve heads with appropriate bags (canvas or plastic). Remove or cover all computer equipment as appropriate.
	Distribute radios and any available cellular phones to key personnel as a potential, alternate form of communications when phone lines may be disrupted.
	The Operations Team Leader should take the OPA-90 and SPCC plans with him or her when securing the facility(s) in the event cleanup operations must be initiated.
	Shut down AC systems. Shut off electric power at main boxes, lock buildings, gates, etc. and evacuate.
	Ensure evacuation of the facility(s) in sufficient time for personnel to reach safe refuge. If the Operations Team Leader needs to keep some personnel at the facility(s) during the hurricane, do so only after discussing the situation with the corporate office and receiving approval.

5.5.7 Post Hurricane Operations

Date	Action
	When conditions permit, re-man the facility(s).
	Conduct a survey of the facility(s). Initiate any urgent corrective actions and report the facility status to the corporate office by any means possible.
	Mark any safety hazards such as downed electrical lines, damaged structures, and spilled chemicals or petroleum products. Do not attempt to work on any damaged systems or spills without properly trained people and protective equipment.
	Attempt to establish communications with each of the employees and get an assessment of the condition of their personal households. Establish work assignments based on the facility's ability to function and the employees ability to respond.
	Respond to oil spills in accordance with OPA 90 plans. It is likely that response equipment will need to be brought in from outside.
	Develop a plan that prioritizes repair efforts and identifies resources necessary to accomplish the tasks. If product handling is possible, reach an agreement with the corporate office as to which customers will be given priority. Be aware that vehicle fuels will be in high demand and government agencies may have special needs that must be taken care of.

5.5.8 Tornado/Storm Warning

The purpose of this section is to establish procedures to be followed in the event the facility(s) receives a tornado warning for your area. A tornado warning indicates a tornado has been sighted or is indicated by radar.

Severe weather alerts are transmitted through sirens in some areas, and by radio and television forecasts. If a tornado warning is broadcast, everyone must assume that a tornado is headed their way and should seek shelter immediately. Typically, there are only minutes between a tornado warning and a tornado strike. So, there should not be any delays in finding suitable protection. Waiting could mean the difference between life and death. Tornado warnings are normally effective for one hour from the last notification unless indicated by the National Weather Service (NWS). Personnel should remain sheltered until the warning expires or the NWS issues a release. Occupants should listen for severe weather warnings on NWS bands or a local radio station for information if the weather suddenly becomes violent, it begins to hail, or strong wind gusts prohibit safe passage.

Minimum Action to be Taken Based on Specific Weather Alerts:

Severe Thunderstorm Watch—Be aware that conditions may be ripe for development of a tornado.

Severe Thunderstorm Warning—Review Severe Weather Action Plans. Usual activities can continue but occupants should be prepared to take shelter. Occupants should avoid going outside, if possible.

Tornado Watch—Review Severe Weather Action Plans. Personnel should be prepared for impending weather.

Tornado Warning—Close exterior doors. All personnel should seek weather shelter. Seek shelter in a small well-supported room/closet void of windows if possible. Remain seated with backs to the wall and heads protected. Remain as low as possible to reduce potential for injury from glass or flying debris. If available, some form of covering should be used to protect heads, arms and legs.

Lightning in the area—Avoid high ground, water, open spaces and metal objects. Avoid all metal shelters. Do not congregate with others.

When a Tornado Strikes the Area:

The NWS will notify when it is safe to assemble

Assess damage

Advise the Operations Manager whether business can continue normal operations

Work with internal and external agencies to coordinate search and rescue operations

5.6 Evacuation Plan

The primary concern during emergency situations at this facility is the safety of all personnel. Familiarity with the general layout of the facility(s), relative to public transportation routes, is necessary to ensure a safe exit during life-threatening emergencies. In-plant emergency conditions are managed in accordance with the Port Neches Performance Products Process Emergency Procedures developed for plant process units. Process unit stability or shutdown will be performed in a controlled manner and all operators, Fire Brigade, Hazmat and Operations Team Leaders are considered Essential Personnel. As such, unless directed by the Incident Commander, Essential Personnel will remain at their workstations to carry out Process Emergency Procedures. The following are factors to consider during evacuation from the facility.

Location of Stored Materials

Hazards Imposed By Spilled Materials

Spill Flow Direction

Prevailing Wind Speed and Direction

Water Currents, Tides, or Wave Conditions

Route of Emergency Personnel and Equipment
Evacuation Routes
Alternate Routes of Evacuation
Transportation of Injured Personnel
Incident Command Post Location
Location of Shelter at the Facility

A facility evacuation diagram is included in **Appendix A**.

When the Emergency Alert System is activated, appropriate remedial action or reporting to staging areas as required in the Emergency Procedures Manual, must be observed:

1. Remedial actions will include stopping all hot-work throughout the facilities.
2. Stopping all vehicular traffic within the facilities.
3. Stopping all machinery (outside) which could become a possible ignition source.

Once the evacuation alarm is sounded, all personnel within the plant (except those directly responsible for process operations) must evacuate to one of the staging areas throughout the facilities. Staging areas downwind or in close proximity of an actual event should be avoided.

Once at the staging areas, each individual must sign-in (using the forms provided in the Staging area accountability boxes), or scan-in (if available). Once accounted for, the individual must remain at the staging area until an all clear is given, or unless instructed otherwise by IC or Emergency Response personnel.

The IC will arrange (or assign someone with the responsibility) for the accounting of personnel at the staging areas, including those who remain in the unit to handle the process operations. Further, the IC will arrange for the guards to establish the listing of persons inside the plant boundaries for reconciliation.

Persons directly responsible for process operations should remain in the area (if possible) and don a SCBA when conditions make this necessary. They should remain in breathing air until further instructions are given by the IC or the appropriate Team Leader. If necessary, these individuals may be required to assist in shutting down the process, or mitigating a release.

5.7 Shelter-In-Place

Shelter-in-place is not the preferred method of protection for employees at the PNPP facility. Control rooms and other potential shelter in place locations may be under positive pressure, where an introduction of outside air is provided by a stack or roof vent. Preventing the introduction of outside contaminated air into the area may not provide the necessary assurances of a safe atmosphere within the shelter location. Evacuation of all areas/units is the preferred method of protecting employees, but in some cases key Operations personnel may be required to maintain a presence inside a control room/shelter to provide for the orderly emergency shutdown of that unit. Employees will be notified by their supervisor or the Incident Commander if sheltering-in-place is required of that area/unit, all others must evacuate as necessary to their designated muster points.

The following steps must be followed to provide employee protection from any contaminated outside air being introduced into the shelter.

Notify the Incident Commander by radio or phone (55) of the requirement to shelter-in-place, the location, and the number of employees at that location

Air conditioning, heating or other system, including pressurized control room systems, must be shutdown to prevent the introduction of outside air into the control room.

Shut all doors, windows, and pressure system vents.

Secure SCBA or supplied air system to facilitate the protection of employees while conducting the emergency shutdown of the unit. Breathing air must be tagged for immediate use. Each employee required to shelter-in-place must be provided emergency air in front of a SCBA or supplied air.

Employee(s) should secure an evacuation route prior to exiting the shelter location by contacting the Incident Commander for direction by radio or phone (55)

Only employees needed to facilitate the emergency shutdowns are permitted to shelter-in-place. All other employees must evacuate the control room/unit.

6.0 Prevention

The Huntsman Port Neches Performance Products facility maintains Mechanical Integrity and Preventative Maintenance programs for covered equipment at the site to comply with Process Safety Management (PSM) and Risk Management Program (RMP) regulations. The program assures that equipment used to process, store, or handle toxic, reactive, flammable or highly hazardous chemicals are designed, constructed, installed and maintained to prevent failure and minimize the consequences of catastrophic releases of such chemicals.

The Health & Safety Manager is the designated person who is accountable for process safety management, with the Maintenance Manager responsible for preventative maintenance and discharge prevention. The Health & Safety Manager monitors implementation of the PSM and RMP programs and reports to facility management. The overall program is implemented by individual departments for their specific areas which includes Mechanical (Fixed Equipment or Rotating Equipment), Electronics/Instrumentation, and Daily Operations. Each department has developed specific inspection records, Operator Check Sheets, for each operating area under the departments' responsibility. Deficiencies are tracked in the facility Computerized Maintenance Management System (CMMS, or the PASSPORT system).

6.1 Container Leak/Overfill Prevention

All storage vessels, including production equipment, are steel containers installed on earthen or concrete pads. Containers are equipped with mechanical tank gauging systems to prevent overfill. The tanks are equipped with automatic tank gauging devices and high liquid level alarms and shut-ins. These vessels undergo preventative maintenance and repair in accordance with good engineering practices. Storage capacity of the tanks is sufficient to accommodate more than one day's production. Tanks are gauged on a daily basis and prior to unloading. Operators visually monitor all unloading operations.

6.2 Secondary Containment

The use of appropriate physical containment and control systems are consistently employed throughout the facility to prevent the discharge of oil from reaching navigable waters or polluting the area immediately surrounding the facility. The facility utilizes earthen berm containment systems to keep spilled materials from escaping containment areas. These systems are designed with the capacity of the largest single tank plus sufficient (or 10%) freeboard for precipitation. The berms are fitted with drain lines (or weir structures) for discharging clean storm water. The line is equipped with a manual valve which is kept closed except during periods of supervised discharges. The systems are regularly inspected for structural integrity, debris, and oil sheens or accumulations. Any such accumulations are removed prior to discharging storm water. The Spill Prevention, Control and Countermeasure Plan include the dimensions of the systems and a calculation of their storage capacities.

6.3 Piping and Valves

Daily visual inspections and quarterly, and/or annual testing are conducted to check pumps, piping, and transfer areas for evidence of leaks, spills or corrosion and are in proper working order. Piping, valves, and pumps are located within containment areas or in areas where spillage can be easily collected by facility personnel.

6.3.1 Pipe Supports

Pipeline supports are designed to minimize abrasion and corrosion and allow for expansion and contraction. U-bolt, clamp and/or welded pipe saddles are used (where appropriate).

6.3.2 Manifolds

All manifolds have check valves on individual piping. Daily visual inspections and quarterly, and/or annual testing are conducted to check manifolds and associated transfer areas for evidence of leaks, spills or corrosion and are in proper working order.

6.3.3 Corrosion Protection

All pipelines are externally coated or painted. If a pipeline is repaired, or if significant corrosion has been detected, that line is tested to ensure integrity.

6.4 Truck/ Tank Railcar Loading/Unloading Operations

These facilities are not equipped with either loading racks or secondary containment for loading areas. However, the following spill prevention practices have been implemented with regard to truck and/or tank railcar loading/unloading operations:

Vehicles entering the facility are warned not to endanger aboveground piping or other oil transfer operations.

Warning signs and wheel chocks are provided in loading/unloading areas to prevent vehicular departure before complete disconnect of flexible or fixed transfer lines.

Prior to filling and departure of any tank truck, the lowermost drain and all outlets of such vehicles are closely examined for leakage, and if necessary, tightened, adjusted, or replaced to prevent leakage.

(b) (7)(F) [redacted]

6.6 Inspections, Tests, and Records

6.6.1 Daily Shift Inspections

Routine visual inspections are conducted daily by operators in each process area, and include the following:

Inspect all vessels for proper operation and condition, including gauges, sight glasses, level controls, pressure controls, and signs of connection leaks.

Inspect control valve packing and pump packing for leaks.

Inspect all block valves, unions, flange connections, and piping for leaks.

Inspect traps, drains, and sumps for oil accumulation and proper operation of level controls and pumps.

Inspect tank seams, all tanks surfaces, and bases of tanks for leaks and external corrosion.

Inspect vent system outlets and sump piping or gutters to ensure they are not obstructed.

Inspect area surrounding vessels, piping and facility for oil sheens or accumulations, spilled material, soil discoloration, or stressed vegetation.

Inspect secondary containment systems for structural integrity and the presence of oil sheens or accumulations.

Inspect area surrounding containment for presence of spilled material, debris, or stressed vegetation.

If the facility is operating in acceptable condition, the operator will record his/her finding on the Operator Check Sheet for the specific area (refer to **Appendix F** for example check sheets). If an inspection

reveals that repairs are required, deficiencies will be reported on the JCO19 (for leaks) or on the CMMS or Passport System (refer to **Appendix F** for an example of the report) to schedule repair or maintenance.

6.6.2 Inspections

Comprehensive inspections are conducted annually, or at a frequency in keeping with the Process Safety Management standard, which incorporates good engineering practice or industry standard. The following procedures are included in the Port Neches Performance Products inspection protocols and the table below shows which department has responsibility for conducting a specific equipment inspection. Details regarding the inspection procedures themselves are contained in the Preventative Maintenance Standard Procedures documentation.

Records of all equipment inspections will be maintained at the facility for a period of three years. The Site Manager, Port Neches Performance Products, or his/her designee, will conduct an annual review of the plan contents and verify that the operations personnel are properly conducting the required equipment inspections/tests and are properly maintaining the required documentation. The annual in-field review is recorded as part of the Process Safety Management program record keeping requirements.

Site Inspection Performance Table	Reliability Group			Operations Group
	Instrument & Electrical	Rotating Equipment	Fixed Equipment	Daily Operations
Foundation				
Signs of soil or foundation failure			X	
Grade ring/foundation structurally sound			X	
Adequate drainage away from tank			X	
Visible signs of leakage around tank bottom			X	X
Shell				
Visible signs of active holes/leaks			X	X
Visible signs of active cracks or seepage in seams			X	X
Visible signs of active cracks or seepage at patches			X	X
Visible signs of cracks in shell/roof seam			X	X
Appurtenances				
Thief hatch and pressure relief valves seal properly		X	X	X
Overflow piping operational and in good condition		X	X	
Flame arrestor operational on vent line			X	
Stairways and waterways structurally sound			X	X
Miscellaneous				
Tankage cathodic protection system operational	X			
Pipeline cathodic protection system operational	X			
Pumps		X		
Compression		X		
Lubrication		X		
Secondary containment				
Visible cracks or seepage in berm or containment			X	X
Erosion or damage to berm or containment			X	X
Spilled material or stressed vegetation surrounding area				X
Storm water drain line valves locked				X
Safety device testing				
Safety device testing		X	X	

6.7 Preventive Maintenance

The Huntsman Port Neches Performance Products facility maintains Mechanical Integrity and Preventative Maintenance programs for covered equipment at the site to comply with Process Safety Management (PSM) and Risk Management Program (RMP) regulations. The program assures that equipment used to process, store, or handle toxic, reactive, flammable or highly hazardous chemicals are designed, constructed, installed and maintained to prevent failure and minimize the consequences of catastrophic releases of such chemicals.

The Health & Safety Manager is the designated person who is accountable for process safety management, with the Maintenance Manager responsible for preventative maintenance and discharge prevention. The Health & Safety Manager monitors implementation of the PSM and RMP programs and reports to facility management. The overall program is implemented by individual departments for their specific areas which includes Mechanical (Fixed Equipment or Rotating Equipment), Electronics/Instrumentation, and Daily Operations. Each department has developed specific inspection records, Operator Check Sheets, for each operating area under the departments' responsibility. Deficiencies are tracked in the facility Computerized Maintenance Management System (CMMS, or the PASSPORT system).

6.8 Housekeeping

The required inspections are the first line of defense for the prevention of oil and gas discharges from storage facilities. Maintenance of valves, piping, flanges, metal surface of tanks, etc. must be performed when signs of potential failure or excessive corrosion are noted. Additional housekeeping measures are exercised to prevent oil from migrating offsite and are as follows:

Oily equipment is regularly wiped down with oil absorbent pads to collect free oil and reduce volatilization.

All oil absorbent materials (stone ground clay and cloth pads) will be collected and disposed of in either sealed plastic bags or metal drums/containers.

Containers which are used for oil and oil contaminated materials will not be left open to allow for evaporation, or accumulation of storm water.

The facility will need to be kept clean of waste materials and loose debris on a daily basis.

7.0 Training

Facility response training, drills/exercises, personnel response training, and spill prevention meetings in this section comply with the requirements of 40 CFR 112.21. Logs of all training activities are kept on site per record keeping requirements. Forms used to document inspections, drills and training are included in **Appendix F**.

The Huntsman PNPP response training program is based on the duties and functions that will be performed by the responder. Response training is under the direction of the Huntsman PNPP Environmental, Emergency Response, Health and Safety, Industrial Hygiene and Training Departments which coordinate their specific training programs into a comprehensive schedule of instructions. Huntsman PNPP response personnel receive training pertinent to:

- Hazardous waste management.
- Emergency response operations.
- Spill prevention and response operations.
- Operation and maintenance of equipment to prevent discharges of hazardous substances.

The training is updated as necessary to reflect current facility hazardous waste management and procedures.

Response Personnel

Response personnel are trained by certified instructors, knowledgeable of the subject and area on which they are conducting the training. The Huntsman PNPP trainer annually attends outside seminars and/or conferences to remain up-to-date on requirements.

New hire personnel will successfully complete their formal classroom training before they are permitted to participate in an actual emergency situation.

Huntsman PNPP also designates the Incident Commander as the person responsible for spill prevention and control at the facility. Huntsman PNPP conducts spill prevention briefings to ensure employee understanding of the facility spill prevention and control procedures.

All personnel at Huntsman PNPP sites are trained in the safe evacuation and accounting of personnel in the event of a major fire, hazardous material, or gas release.

Covered Employees and Levels of Training

HAZWOPER training is required for all employees involved in the hazardous waste operations at Huntsman PNPP facilities and for employees who are involved in some level of response to plant emergencies involving hazardous substances.

The training classifications and the amounts of required training are specified in the following table:

CLASSIFICATION	INITIAL TRAINING	ANNUAL REFRESHER TRAINING
PNPP Facility: R&S – Dockmen and Supervisors, Operators	8 hours	8 hours
Utilities-Boiler (Process Liquid Fuel) – Operations Team Leaders	40 hours	8 hours
CLASSIFICATION	**INITIAL TRAINING**	**ANNUAL REFRESHER TRAINING**
– Fire Brigade/ Rescue Team	24 hours	8 hours
– R & S, E4, E6	24 hours	8 hours
– Shift Operations Team Leaders – Operators/ Loaders	24 hours	8 hours
All Plant employees - Awareness Level Training – Component of Annual E, H & S Training	8 hours	8 hours

CLASSIFICATION	INITIAL TRAINING	ANNUAL REFRESHER TRAINING
Level 1- First Responder Awareness Level	8 hours	8 hours
Level 2 - First Responder Operations Level	8 hours	8 hours
Level 3 - HAZMAT Technician	24 hours	8 hours
Level 4 - HAZMAT Specialist	40 hours	8 hours
Level 5 - On Scene Commander and Incident Commander	40 hours	8 hours

Level 1- First Responder Awareness Level:

Individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release.

They would take no further action beyond notifying the authorities of the release.

Level 2- First Responder Operations Level:

Individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release.

They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures.

Level 3- Hazardous Materials (HAZMAT) Technician:

Individuals who respond to releases or potential releases for the purpose of stopping the release.

They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance.

Level 4- Hazardous Materials (HAZMAT) Specialist:

Individuals who respond with and provide support to hazardous materials technicians.

Their duties parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain.

Level 5- Incident Commander On-Scene Commander:

Will assume control of the incident beyond the first responder awareness level.

Training for HAZMAT technicians and specialists, Incident Commander and On-Scene Commanders is provided at accredited training organizations. Training for first responder awareness level and first responder operations level consists of the following:

TRAINING COURSE CONTENT	REFERENCE
Resource Conservation and Recovery Act Scope: Review of hazardous waste regulations and how they apply at Huntsman PNPP. Includes review of spill and contingency plans.	40 CFR 264.16
Scope: Review of emergency procedures at Huntsman PNPP. Describes employee's roles during emergencies. Includes notification procedures, site security, containment procedures, alarms, and evacuation routes.	29 CFR 1910.120 (p)(1) and (q)

TRAINING COURSE CONTENT	REFERENCE
Personal Protective Equipment Scope: Training as necessitated for employee exposures. Includes: Eye and Face Protection Respiratory Protection Head Protection Foot Protection	29 CFR 1910.133 29 CFR 1910.134 29 CFR 1910.135 29 CFR 1910.136

TRAINING COURSE CONTENT	REFERENCE
Portable Fire Extinguishers Scope: Where provided for employee use, employees shall be trained in operation and use of extinguishers as well as their limitations.	29 CFR 1910.157
Hazard Communication Scope: Knowledge of physical and health hazards, protection methods, emergency procedures, labeling, detection, spill procedures, and material safety data sheets.	29 CFR 1910.1200
Huntsman PNPP Health and Safety Review Scope: Employees are educated on health and safety topics involving specific hazardous substances encountered at Huntsman PNPP such as: benzene, butadiene, ethylene oxide, and hydrogen sulfide.	29 CFR 1910.1200

Volunteers and Casual Laborers

Hazardous Waste Operations and Emergency Response (HAZWOPER) training is required for any volunteers or casual laborers involved in the oil and hazardous waste operations at Huntsman PNPP facilities or at responses of releases from the facility. HAZWOPER training will be delivered based on the activity, potential exposure and assigned responsibilities, in the amount and content dictated by the requirements of 29 CFR 1910.120. Our OSRO will perform the requisite training before the employment of any such individuals.

7.1 Drills and Exercises

A schedule of on-site drills and training exercises are coordinated by the Qualified Individual. Response training programs will comply with the Preparedness for Response Exercise Program (PREP), and the U.S. Coast Guard/Environmental Protection Agency training guidelines for oil spill response. **Table 6** includes a list of regular personnel training exercises.

Table 6
Response Training Exercises

Exercise	Frequency	Participants
QI Notification Exercise	Quarterly	Qualified Individuals
Emergency Incident Command Team (table top)*	Annually	Emergency Incident Command Team
Equipment Deployment Exercise	Annually	Facility and OSRO
Discharge Prevention Briefings	Annually	Oil-handling Personnel
Simulated Spill Drill**	Annually	Oil-handling Personnel

* In a 3 year period, at least one of these exercises must include a worst case discharge scenario.

** In a 3 year period, all components of the response plan must be exercised.

Annually, at least one of the exercises listed above must be unannounced. Unannounced means the personnel participating in the exercise must not be advised in advance, of the exact date, time and scenario of the exercise.

The annual IC TEAM tabletop exercise will include the actual notification to the NRC, the TGLO and the OSRO, to determine availability and response times. Each call that is made will begin with the statement "This is a drill".

The owner/operator will participate in unannounced exercises as directed by the lead federal agency. The objectives of the unannounced exercises will be to test notifications and equipment deployment for response to the average most probable discharge. After participating in an unannounced exercise directed by the lead federal agency, the owner/operator will not be required to participate in another unannounced exercise for at least 3 years from the date of the exercise.

The owner/operator will also participate in Area exercises as directed by the applicable On-Scene Coordinator. The Area exercises will involve equipment deployment to respond to the spill scenario developed by the Exercise Design Team, of which the facility owner or operator will be a member. After participating in an Area exercise, a facility owner or operator will not be required to participate in another exercise for at least six years.

All drills and exercises will be documented on the Emergency Response Critique forms, included in **Appendix F.** Records of these activities will be maintained for a period of three years.

7.2 Plan Training

Plan training sessions are held for staff and operating personnel on an annual basis. The intent of these sessions is to keep personnel informed of their obligation to respond to all emergencies, prevent pollution incidents and to improve spill control and response techniques. These briefings highlight and describe known spill events or failures, malfunctioning components, and recently developed precautionary measures to prevent spills.

All field personnel will be indoctrinated in the proper procedures for the reporting of spills. Included in this training are procedures for contacting the Qualified Individual on a 24-hour basis. They will also review procedures on how and where to place facility containment/recovery materials depending on where the spill occurs and various seasonal conditions. Personnel will be informed that detergents or other surfactants are prohibited from being used on an oil spill in the water, and that dispersants may only be used with the approval of the Regional Response Team.

Records of all training activities are maintained for at least five years following completion of training. The facility will maintain records for each individual as long as these individuals are assigned duties in this plan.

7.3 Training for Qualified Individual

Training will be conducted for the Qualified Individuals listed in this plan and their designated delegates. The training elements can include but are not limited to:

Notification procedures

Communication systems

Information on products carried and/or stored

Procedures personnel will use to mitigate or prevent any discharge of product

Capabilities of OSROs

Responsibilities and authorities of the QI

Incident Command System / NIMS

Responsibilities of IC TEAM members

Drill and exercise program to meet regulations

National Contingency Plan and ACPs applicable to the area of facility

24 hours of HAZWOPER training

OSHA requirements for worker health and safety

Public affairs

Crisis management

Salvage operations (if applicable)

Procedures for obtaining approval for use of dispersants and in-situ burn

Oil spill trajectory analysis

Sensitive environmental areas

7.4 Training for Emergency Incident Command Team Personnel

The key to training IC TEAM members is to train them according to their functional role within the response organization. Members staffing an operations center need to be trained differently from members whose primary function is logistics. Many of the facility's personnel will be able to draw upon skills they use and training they have obtained in the facility's everyday activities of running the facility operation. The goal is to train IC TEAM personnel so that the team can function as a coordinated unit, and direct the cleanup activities or preventative measures in an efficient and timely manner.

The following is a suggested list of training elements for IC TEAM members:

Notification procedures and requirements

Communication systems used for notification

Information on products stored at the facility

Operational capabilities of the contracted OSROs to respond to a small discharge (average most probable discharge, medium discharge (maximum most probable discharge), and worst case discharge

Responsibilities and authority of the QI

Organizational structure that will be used to manage the response actions

Responsibilities and duties of the IC TEAM member within the organizational structure

Drill and exercise program to meet federal and state regulations

Area Contingency Plans

National Contingency Plan

7.5 Spill Response Personnel Training

Employee and third party contractor personnel are provided with annual hands on training classes in the deployment and operation of pollution control equipment.

Oil spill responders are required to adhere to the training and safety requirements outlined in the OSHA's Hazardous Waste Operations and Emergency Response regulations in 29 CFR 1910.120(q). Personnel having a potential for minimal exposure to a hazardous substance are required to have 24 hours of initial oil-spill response instruction and eight hours of actual field experience. Those spill responders having potential exposure to a hazardous substance at levels exceeding the permissible exposure limits (generally, those situations requiring the use of a respirator and protective clothing) are required to have 40 hours of initial training off site and 24-hours of actual field experience.

On-site management and supervisors are required to receive the same amount of training as the equipment operators and general laborers, with the addition of eight hours of specialized training in hazardous waste management. Eight hours of annual refresher training are required of both general employees and managers.

7.6 Wildlife Rescue and Rehabilitation Volunteers

The facility will rely upon the recommendations of the U.S. Fish and Wildlife Service (USFWS) in dealing with oiled wildlife. Only trained personnel, approved by the USFWS, will be utilized to respond to incidents involving oiled wildlife. Volunteers will be trained by the our OSRO if necessary.

7.7 Training Documentation and Record Maintenance

Spill response personnel training records will be maintained at this location for five years and will include:

Documentation of yearly training associated with the Facility Integrated Contingency Plan as provided to IC TEAM and facility personnel

Records of personnel training in accordance with OSHA-29 CFR 1910.120 Regulations

Records of training provided for response contractor personnel will be maintained at the respective contractor's office and will be verified by facility personnel on-site.

Cross References and Definitions

7.8 DOT, PHMSA - FRP

Oil Spill Response Plan (49 CFR 194)		Plan Reference
194.103 (a)	Each operator shall submit a statement with its response plan identifying which line sections in a response zone can be expected to cause significant and substantial harm to the environment in the event of a discharge of oil into navigable waters or adjoining shorelines.	Section 2.3
194.105 (a)	Each operator shall determine the worst case discharge for each of its response zones and provide the methodology, including calculations, used to arrive at the volume.	Section 2.5
194.107 (a)	Each response plan must plan for resources for responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge.	Section 2.7
194.107 (c)	Each response plan must be consistent with the NCP and each applicable ACP.	Section 1.3
194.107 (d)(1)(i)	Must include an information summary as required in 194.113	Section 2.0
194.107(d)(1)(ii)	Immediate notification procedures	Section 3.4
194.107(d)(1)(iii)	Spill detection and mitigation procedures	Sections 3.1, 3.2 and 4.0
194.107(d)(1)(iv)	Name, address, and telephone number of the OSRO	Section 2.12 and Appendix B
194.107(d)(1)(v)	Response activities and response resources.	Sections 2.7 and 4.0
194.107(d)(1)(vi)	Names and telephone numbers of Federal, State and local agencies which the operator expects to have pollution control responsibilities or support.	Sections 3.4 and Appendix B
194.107(d)(1)(vii)	Training procedures.	Section 7.0
194.107(d)(1)(viii)	Equipment testing	Section 2.10
194.107(d)(1)(ix)	Drill types, schedules, and procedures	Section 7.1
194.107(d)(1)(x)	An appendix for each response zone including all information from 194.107(d)(1)(i-ix)	Section 2.13
194.111	Plan must be retained at operator's headquarters, with each QI and in the field at the operator's discretion.	Section 1.4
194.113(a)(1)	Name and address of the operator	Section 2.1
194.113(a)(2)	A listing of each response zone, including county and state.	Section 2.13
194.113(b)(2)	Name and telephone number of the QI available on a 24-	Section 2.2

Oil Spill Response Plan (49 CFR 194)		Plan Reference
	hour basis	
194.113(b)(4)	A list of line sections for each pipeline contained in the response zone, identified by milepost or survey station number, or other operator designation	Section 2.6
194.113(b)(5)	Basis for the operator's determination of significant and substantial harm	Section 2.3
194.113(b)(6)	Type of oil and volume of the worst case discharge.	Sections 2.1 and 2.5
194.115(a)	Identify and ensure, by contract or other approved means, the resources necessary to remove, to the maximum extent practicable, a worst case discharge and to mitigate or prevent a substantial threat of a worst case discharge.	Section 2.12
194.115(b)	Identify the response resources which are available to respond within the time specified, after discovery of a WCD or to mitigate the substantial threat of such a discharge with the appropriate tier times.	Section 2.12
194.117(a)(1)	Each operator shall conduct training to ensure that all personnel know their responsibilities under the plan, name and address and procedure for contacting the operator on a 24 hour basis, name and procedures for contacting the QI on a 24 hour basis	Section 7.0
194.117(a)(2)	Reporting personnel must know the content of the information summary of the plan, the NRC phone number and notification process.	Section 2.0 and 3.4
194.117(a)(3)	Personnel engaged in response activities must know the characteristics and hazards of the oil discharged, the conditions that are likely to worsen emergencies, including the consequences of facility malfunctions or failures, and the appropriate corrective actions, steps necessary to control any accidental discharge of oil and to minimize the potential for fire, explosion, toxicity, or environmental damage, and proper firefighting procedures and use of equipment, fire suits, and breathing apparatus.	Sections 4.0 and Appendix D
194.117(b)	Operator shall maintain a training record for each individual that has been trained as required by this plan.	Section 7.7

7.9 EPA - FRP

Oil Pollution Regulation (40 CFR 112)		Plan Reference
112.1	Applicability	Annex A
112.2	Definitions	Annex A
112.3	Preparation and implementation requirements	Annex A
112.4	Amendment by Regional Administrator	Annex A
112.5	Amendment by owner/operator	Annex A
112.7	General SPCC Plan requirements	Annex A
112.8	SPCC Plan requirements for onshore facilities	Annex A
112.20(h)(1)(i)	Identity and telephone number of QI	Section 2.2
112.20(h)(1)(ii)	Identify of individuals/organizations to contact if there is a discharge	Section 3.4
112.20(h)(1)(iii)	Description of information to pass to response personnel in event of a reportable spill.	Section 3.4
112.20(h)(1)(iv)	Description of facility's response equipment and its location	Section 2.7
112.20(h)(1)(v)	Description of response personnel capabilities, including duties of facility personnel during a response action	Section 4.0
112.20(h)(1)(vi)	Plans for evacuation of the facility and a reference to community evacuation plans	Section 5.6
112.20(h)(1)(vii)	Description of immediate measure to secure and contain the source of the discharge	Section 3.1
112.20(h)(1)(viii)	Diagram of the facility	Appendix A
112.20(h)(2)	Facility information – location, type, owner, operator, QI	Section 2.0
112.20(h)(3)(i)	Information about emergency responses	Sections 3.0 and 4.0
112.20(h)(3)(ii)	Evidence of contracts or other approved means for ensuring personnel and equipment availability	Section 2.12
112.20(h)(3)(iii)	Identity and telephone of individuals/organizations to be contacted in event of a discharge	Section 3.4
112.20(h)(3)(iv)	Description of information to pass to response personnel in event of a reportable spill	Section 3.4
112.20(h)(3)(v)	Description of response personnel capabilities, including duties of facility personnel during a response action	Section 4.0
112.20(h)(3)(vi)	Description of a facility's response equipment, location of the equipment, and equipment testing	Section 2.7 and 2.10

Oil Pollution Regulation (40 CFR 112)		Plan Reference
112.20(h)(3)(vii)	Plans for evacuation of the facility and a reference to community evacuation plans as appropriate	Section 5.6
112.20(h)(3)(viii)	Diagram of evacuation routes	Appendix A
112.20(h)(3)(ix)	Duties of the qualified individual	Sections 2.2, 3.0 and 4.0
112.20(h)(4)	Hazard evaluation	Section 2.3
112.20(h)(5)(i)	Worst case discharge	Section 2.5
112.20(h)(5)(ii)	Discharge of 2100 gallons or less	Section 2.5
112.20(h)(5)(iii)	Discharge > 2,100 gallons and <36,000 gallons	Section 2.5
112.20(h)(6)	Discharge detection systems	Section 3.1
112.20(h)(7)(i)	Response actions to be carried out	Sections 3.0 and 4.0
112.20(h)(7)(ii)	Description of response equipment to be used for each scenario	Section 2.7
112.20(h)(7)(iii)	Plans to dispose of contaminated cleanup materials	Section 4.5
112.20(h)(7)(iv)	Measures to provide adequate containment and drainage of spilled oil	Section 6.0
112.20(h)(8)(i)	Checklist and record of inspection for tanks, secondary containment, and response equipment	Section 6.6
112.20(h)(8)(ii)	Description of the drill/exercise program to be carried out under the response plan	Section 7.1
112.20(h)(8)(iii)	Description of the training program to be carried out under the response plan	Section 7.0
112.20(h)(8)(iv)	Logs of discharge prevention meetings, training sessions, and drills/exercises – may be in annex to plan.	Section 7.7
112.20(h)(9)	Diagrams of facility and drainage	Appendix A
112.20(h)(10)	Security systems description	Section 6.5
112.20(h)(11)	Response plan cover sheet	Section 1.2
112.21	Facility response training and drills/exercises	Section 7.0
App F (1.4.1)	Hazard identification	Section 2.3
App F (1.4.2)	Vulnerability analysis	Section 2.11
App F (1.4.3)	Analysis of the potential for an oil spill	Section 2.11
App F (1.4.4)	Facility reportable oil spill history	Section 2.1

Oil Pollution Regulation (40 CFR 112)		Plan Reference
App F (1.5.1)	Small and medium worst case discharges	Section 2.5
App F (1.5.2)	Identify worst case discharge volume and provide scenario	Section 2.9
App F (1.6.1)	Discharge detection by personnel	Section 3.1
App F (1.6.2)	Automated discharge detection	Section 3.1
App F (1.7.1)	Response resources for small, medium and worst case spills	Section 2.7
App F (1.7.2)	Disposal plans	Section 4.5
App F (1.7.3)	Containment and drainage planning	Section 6.2

7.10 EPA - RCRA

RCRA (40 CFR Part 264 Subpart D, 40 CFR Part 265 Subpart D, 40 CFR Part 279.52 (b))		Plan Reference
264.52	Content of contingency plan	
(a)	Emergency response actions	
(b)	Amendments to SPCC Plan	
(c)	Coordination with state and local response parties	Section 4.2
(d)	Emergency coordinator(s)	Section 2.2
(e)	Detailed description of emergency equipment on-site	Section 2.7
(f)	Evacuation plan if applicable	Section 5.6
264.53	Copies of contingency plan	Section 1.0
264.54	Amendment of contingency plan	Section 1.0
264.55	Emergency coordinator	Section 2.2
264.56	Emergency procedures	
(a)	Notification	Sections 2.2, 3.4, Appendix B
(b)	Emergency identification /characterization	Sections 3.2, 5.0
(c)	Health/environmental assessment	Section 4.4
(d)	Reporting	Section 3.4
(e)	Containment	Section 4.4

RCRA (40 CFR Part 264 Subpart D, 40 CFR Part 265 Subpart D, 40 CFR Part 279.52 (b))			Plan Reference
	(f)	Monitoring	Section 4.4
	(g)	Treatment, storage, or disposal of wastes	Section 4.5
	(h)	Cleanup procedures	
		(1) Disposal	Sections 4.4, 4.5
		(2) Decontamination	Sections 4.4, 4.5
	(i)	Follow-up procedures	Section 4.6
	(j)	Follow-up report	Sections 3.4, 4.6, Appendix F
265.52		Content of contingency plan	
	(a)	Emergency response actions	
	(b)	Amendments to SPCC Plan	
	(c)	Coordination with state and local response parties	Section 4.2
	(d)	Emergency Coordinator(s)	Section 2.2
	(e)	Detailed description of emergency equipment on-site	Section 2.7
	(f)	Evacuation plan if applicable	Section 5.6
265.53		Copies of contingency plan	Section 1.0
265.54		Amendment of contingency plan	Section 1.0
265.55		Emergency coordinator	Section 2.2
265.56		Emergency procedures	
	(a)	Notification	Sections 2.2, 3.4, Appendix B
	(b)	Emergency identification /characterization	Sections 3.2, 5.0
	(c)	Health/environmental assessment	Section 4.4
	(d)	Reporting	Section 3.4
	(e)	Containment	Section 4.4
	(f)	Monitoring	Section 4.4
	(g)	Treatment, storage, or disposal of wastes	Section 4.5
	(h)	Cleanup procedures	

RCRA (40 CFR Part 264 Subpart D, 40 CFR Part 265 Subpart D, 40 CFR Part 279.52 (b))		Plan Reference
	(1) Disposal	Sections 4.4, 4.5
	(2) Decontamination	Sections 4.4, 4.5
(i)	Follow-up procedures	Section 4.6
(j)	Follow-up report	Sections 3.4, 4.6, Appendix F
279.52(b)(2)	Content of contingency plan	
	(i) Emergency response actions	
	(ii) Amendments to SPCC Plan	
	(iii) Coordination with state and local response parties	Section 4.2
	(iv) Emergency coordinator(s)	Section 2.2
	(v) Detailed description of emergency equipment on-site	Section 2.7
	(vi) Evacuation plan if applicable	Section 5.6
(3)	Copies of contingency plan	Section 1.0
(4)	Amendment of contingency plan	Section 1.0
(5)	Emergency coordinator	Section 2.2
(6)	Emergency procedures	
	(i) Notification	Sections 2.2, 3.4, Appendix B
	(ii) Emergency identification /characterization	Sections 3.2, 5.0
	(iii) Health/environmental assessment	Section 4.4
	(iv) Reporting	Section 3.4
	(v) Containment	Section 4.4
	(vi) Monitoring	Section 4.4
	(vii) Treatment, storage, or disposal of wastes	Section 4.5
	(viii) Cleanup procedures	
	(A) Disposal	Sections 4.4, 4.5
	(B) Decontamination	Sections 4.4, 4.5
	Follow-up report	Sections 3.4, 4.6, Appendix F

7.11 OSHA - EAP

OSHA EAP (29 CFR 1910.38(A)		
1910.38(a)	Scope and applicability	Section 1.3
(b)	Written and oral emergency action plans	Section 3.2, 5.0
(c)	Minimum elements	
	(1) Procedures for reporting a fire or other emergency	Section 5.0
	(2) Procedures for emergency evacuation, including type of evacuation and exit route assignments	Section 5.6, Appendix A
	(3) Procedures to be followed by employees who remain to operate critical plant operations before they evacuate	Section 5.6, 4.4
	(4) Procedures to account for all employees after evacuation	Section 5.6
	(5) Procedures to be followed by employees performing rescue or medical duties	Section 4.4.10
	(6) Names or job title of every employee who may be contacted by employees who need more information about the plan or an explanation of their duties under the plan	Section 2.2
(d)	Employee alarm system	Section 5.6
(e)	Training	Section 7.0
(f)	Review of emergency action plan	Section 1.5

7.12 USCG-FRP

Oil Pollution Regulation (33 CFR 154)		**Plan Reference**
154.1030(b)(1)	**Introduction and Plan contents.**	Section 2.1, Appendix B Section 2.1; Appendix A Section 2.2 Page1 Section 8.0 Section 1.5

Oil Pollution Regulation (33 CFR 154)		Plan Reference
154.1030(b)(2)	**Emergency response action plan:**	
154.1030(b)(2)(i)	Notification procedures.	Section 3.4
154.1030(b)(2)(ii)	Facility's spill mitigation procedures.	Section 2.5 Section 3.0 and 4.0 Section 2.7 Section 6.0
154.1030(b)(2)(iii)	Facility's response activities.	Sections 2.12, 2.2, Sections 2.2, 2.7.2, 3.0, 3.4, and Section 4.0, 4.2, 4.3.1, 4.3.6, Appendix C
154.1030(b)(2)(iv)	Fish and wildlife and sensitive environments.	Sections 2.11, 2.7 and Appendix G
154.1030(b)(2)(v)	Disposal plan.	Section 4.5
154.1030(b)(3)	**Training and Exercises:**	
154.1030(b)(3)(i)	Training procedures.	Section 7.0
154.1030(b)(3)(ii)	Exercise procedures.	Section 7.0
154.1030(b)(4)	**Plan review and update procedures**.	Section 1.5
154.1030(b)(5)	**Appendices.**	
154.1030(b)(5)(i)	Facility-specific information.	Section 2.0
154.1030(b)(5)(ii)	List of contacts.	Appendix B
154.1030(b)(5)(iii)	Equipment lists and records.	Sections 2.6, 2.10
154.1030(b)(5)(iv)	Communications plan	Sections 3.0, 4.0
154.1030(b)(5)(v)	Site-specific safety and health plan.	Section 4.3.4
154.1030(b)(5)(vi)	List of acronyms and definitions.	Section 8.6
154.1030(b)(5)(vii)	A geographic-specific appendix for each zone in which a mobile facility operates.	N/A

Oil Pollution Regulation (33 CFR 154)	Plan Reference

7.12.1 Detailed 33CFR 154 cross reference

Oil Pollution Regulation (33 CFR 154)		Plan Reference
154.1026	QI and alternate QI	Section 2.2, 4.3.6
154.1028	Availability of response resources by contract or other approved means	Section 2.12
154.1029	Worst case discharge	Section 2.5
154.1035	Specific requirements for facilities that could reasonably be expected to cause significant and substantial harm to the environment:	
154.1035(a)(1)	Facility name, physical and mailing address, county, telephone and fax	Section 2.1, Appendix B
154.1035(a)(2)	Description of facility's location in a manner that could aid in locating the facility	Section 2.1; Appendix A
154.1035(a)(3)	Name, address, and procedures for contacting the owner/operator on 24 hour basis	Section 2.2
154.1035(a)(4)	Table of contents	Page 1
154.1035(a)(5)	Cross index	Section 8.0
154.1035(a)(6)	Record of changes	Section 1.5
154.1035(b)(1)(i)	Prioritized list identifying person(s), including name, telephone number, and role in plan, to be notified in event of threat or actual discharge	Section 3.4
154.1035(b)(1)(ii)	Information to be provided in initial and follow-up notifications to federal, state and local agencies	Section 3.4
154.1035(b)(2)(i)	Volume of persistent and non-persistent oil groups	Section 2.5
154.1035(b)(2)(ii)	Prioritized procedures/task delegation to mitigate or prevent a potential or actual discharge or emergencies involving certain equipment/scenarios.	Sections 3.0 and 4.0 Section 6.0
154.1035(b)(2)(iii)	List of equipment and responsibilities of facility personnel to mitigate an average most probable discharge.	Section 2.7
154.1035(b)(3)(i)	Description of facility personnel's responsibilities to initiate/supervise response until arrival of qualified individual.	Section 4.0
154.1035(b)(3)(ii)	QI responsibilities/authority	Sections 2.2, 3.4, and 4.2, 4.3.1, 4.3.6
154.1035(b)(3)(iii)	Facility or corporate organizational structure used to manage response actions	Section 4.0
154.1035(b)(3)(iv)	Oil spill response organizations/spill management team available by contract or other approved means.	Section 2.12, Appendix B, Appendix C, 3.0 and 4.0
154.1035(b)(3)(v)	For mobile facilities that operate in more than one COTP,	N/A

Oil Pollution Regulation (33 CFR 154)		Plan Reference
	the oil spill response organization(s)/spill management team in the applicable geographic-specific appendix	
154.1035(b)(4)(i)	Areas of economic importance and environmental sensitivity as identified in the ACP that are potentially impacted by a WCD.	Section 2.11
154.1035(b)(4)(ii)	List areas and provide maps/charts and describe response actions.	Section 2.11
154.1035(b)(4)(iii)	Equipment and personnel necessary to protect identified areas	Sections 2.7, 2.11.1 and Appendix G
154.1035(c)	Training and exercises	Section 7.0
154.1035(d)	Plan review and update procedures	Section 1.5
154.1035(e)(1)	Facility specific information	Section 2.0
154.1035(e)(2)	List of contacts	Appendix B
154.1035(e)(3)	Response equipment lists	Sections 2.10, and Appendix C
154.1035(e)(4)	Communications plan	Sections 3.0 and 4.0
154.1035(e)(5)	Site-specific safety and health plan	Section 4.3.4
154.1035(e)(6)	A geographic-specific appendix	N/A
154.1040	Specific requirements for substantial harm facilities	Section 2.3
154.1041	Specific response information to be maintained on mobile MTR facilities	N/A
154.1045	Response Resources supplied by OSRO and Spill Management Team	Section 2.7.2, Appendix C
154.1050	Training	Section 7.0
154.1055	Drills	Section 7.1
154.1057	Inspection and maintenance of response resources	Section 7.1
154.1060	Submission and approval procedures	Section 1.5
154.1065	Plan revision and amendment procedures	Section 1.5
Appendix D	Training elements for oil spill response plans	Section 7.0

7.13 Definitions

Adverse weather:	The weather conditions that will be considered when identifying response systems and equipment in a response plan for the applicable operating environment. Factors to consider include significant wave height, ice, temperature, weather-related visibility, and currents with the Captain of the Port (COTP) zone in which the systems or equipment are intended to function.
Average most probable discharge:	A discharge of the lesser of 50 barrels or one percent of the volume of the worst case discharge.
Barrel:	Measure of space occupied by 42 U. S. gallons at 60˚F.
Captain of the Port Zone (COTP):	A zone specified in 33 CFR Part 3 and the seaward extension of that zone to the outer boundary of the exclusive economic zone (EEZ).
Cleanup contractor:	Persons contracted to undertake a response action to contain and clean up a spill.
Cleanup:	For the purposes of this document, cleanup refers to the removal and/or treatment of oil, hazardous substances, and/or the waste or contaminated materials generated by the incident. Cleanup includes restoration of the site and its natural resources.
Command Post:	A site located at a safe distance from the spill site where response decisions are made, equipment and manpower deployed, and communications handled. The Incident Commander and the On-Scene Coordinators may direct the on-scene response from this location.
Communication equipment:	Equipment that will be utilized during response operations to maintain communication between employees, contractors, federal/state/local agencies (radio/telephone equipment and links).
Containment boom:	A flotation/freeboard device, made with a skirt/curtain, longitudinal strength member, and ballast unit/weight designed to entrap and contain the product for recovery.
Contingency Plan:	A document used by (1) federal, state, and local agencies to guide planning and response procedures regarding spill of oil, hazardous substances, or other emergencies; (2) a document used by industry as a response plan to spills of oil, hazardous substances, or other emergencies occurring upon their vessels or at their facilities.
Contract or other approved:	Includes: (1) A written contractual agreement with a response contractor. The agreement will identify and ensure the availability of the specified personnel and equipment within stipulated response times in the specified geographic areas. (2) Certification by the facility owner or operator that the specified personnel and equipment are owned, operated, or under the direct

	control of the facility owner or operator, and are available within stipulated times in the specified geographic areas. (3) Active membership in a local or regional oil spill removal organization that has identified specified personnel and equipment that are available to respond to a discharge within stipulated times in the specified geographic areas. (4) A document which: (i) Identifies the personnel, equipment, and services, capable of being provided by the response contractor within stipulated response times in specified geographic areas, (ii) Sets out the parties' acknowledgment that the response contractor intends to commit the resources in the event of a response, (iii) Permits the Coast Guard to verify the availability of the response resources identified through tests, inspections, drills, (iv) Incorporates by reference in the response plan. (5) For a facility that could reasonably be expected to cause substantial harm to the environment, with the consent of the response contractor or oil spill removal organization, the identification of a response contractor or oil spill removal organization with specified equipment and personnel which are available within stipulated response times in specific geographic areas.
Discharge:	Any spilling, leaking, pumping, pouring, emitting, emptying, or dumping.
Dispersants:	Those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column.
Diversion boom:	A flotation/freeboard device, made with a skirt/curtain, longitudinal strength member, and ballast unit/weight designed to deflect or divert the product towards a pick up point, or away from certain areas.
Environmentally sensitive areas:	Streams and water bodies, aquifer recharge zones, springs, wetlands, agricultural areas, bird rookeries, endangered or threatened species (flora and fauna) habitat, wildlife preserves or conservation areas, parks, beaches, dunes, or any other area protected or managed for its natural resource value.
Estuary:	Unique environment at the mouth of coastal rivers where fresh water and sea water meet, providing important habitat for marine life, birds, and other wildlife.
Exclusive economic zone:	The zone contiguous to the territorial sea of the United States extending to a distance up to 200 nautical miles from the baseline from which the breadth of the territorial sea is measured.
Facility that could be reasonably expected to cause significant and substantial harm:	Any fixed MTR onshore facility (including piping and bay structures that are used for the transfer of oil between a vessel and a facility) that is capable of transferring oil, in bulk, to or from a vessel of 250 barrels or more, and a deepwater port. This also includes any facility specifically identified by the COTP.

Facility that could reasonably be expected to cause substantial harm:	Any mobile MTR facility that is capable of transferring oil to or from a vessel with a capacity of 250 barrels or more. This also includes any facility specifically identified by the COTP.
Federal fund:	The oil spill liability trust fund established under OPA.
First responders, first response agency:	A public health or safety agency (that is, fire service or police department) charged with responding to a spill during the emergency phase and alleviating immediate danger to human life, health, safety, or property.
Handle:	To transfer, transport, pump, treat, process, store, dispose of, drill for, or produce.
Hazardous material:	Any non-radioactive solid, liquid, or gaseous substance which, when uncontrolled, may be harmful to humans, animals, or the environment. Including but not limited to substances otherwise defined as hazardous wastes, dangerous wastes, extremely hazardous wastes, oil, or pollutants.
Hazardous substance:	Any substance designed as such by the Administrator of EPA pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act; regulated pursuant to Section 311 of the Federal Water Pollution Control Act.
Hazardous waste:	Any solid waste identified or listed as a hazardous waste by the Administrator of the EPA pursuant to the federal Solid Waste Disposal Act, as amended by the Resources Conservation and Recovery Act (RCRA), 42 U.S.C., Section 6901, et seq as amended. The EPA Administrator has identified the characteristics of hazardous wastes and listed certain wastes as hazardous in Title 40 of the Code of Federal Regulations, Part 261, Subparts C and D respectively.
Immediate response steps:	The immediate steps that are to be taken by the spill observer after detection of a spill.
Incident Commander:	The one individual in charge at any given time of an incident. The Incident Commander will be responsible for establishing a unified command with all on-scene coordinators.
Incident Command System:	A method by which the response to an extraordinary event, including a spill, is categorized into functional components and responsibility for each component assigned to the appropriate individual or agency.
Initial notification:	The process of notifying necessary company personnel and federal/state/local agencies that a spill has occurred, including all pertinent available information surrounding the incident.
Inland area:	The area shoreward of the boundary lines defined on 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area shoreward of the lines of demarcations (COLREG lines) defined in d80.740 - 80.850 of Title 33 of the CFR. The inland area does not include the Gulf of Mexico.
Interim storage site:	A site used to temporarily store recovered oil or oily waste until the

	recovered oil or oily waste is disposed of at a permanent disposal site, Interim storage sites include trucks, barges, and other vehicles, used to store waste until the transport begins.
Lead federal agency:	The agency which coordinates the federal response to incidents on navigable waters.
U. S. Coast Guard (USCG):	Oil and chemically hazardous materials incidents on navigable waters.
U. S. Environmental Protection Agency (EPA):	Oil and chemically hazardous materials incidents on inland waters.
Lead state agency:	The agency which coordinates state support to federal and/or local governments or assumes the lead in the absence of federal response.
Marinas:	Small harbors with docks, services, etc. for pleasure craft.
Marine facility:	Any facility used for tank vessel wharfage or anchorage, including any equipment used for the purpose of handling or transferring oil in bulk to or from a tank vessel.
Marine Transportation-Related Facility:	An onshore facility, including piping and any structure used to transfer oil to or from a vessel, subject to regulation under 33 CFR Part 154 and any deepwater port subject to regulation under 33 CFR Part 150.
Maximum extent practicable:	The planning values derived from the planning criteria used to evaluate the response resources described in the response plan to provide the on-water recovery capability and the shoreline protection and clean-up capability to conduct response activities for a worst case discharge from a facility in adverse weather.
Maximum most probable discharge:	A discharge of the lesser of 1,200 barrels or 10 percent of the volume of a worst case discharge.
National Contingency Plan:	The plan prepared under the Federal Water Pollution Control Act (33 United State Code d1321 et seq) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 United State Code d9601 et seq), as revised from time to time.
Natural resource:	Land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to or otherwise controlled by the state, federal government, private parties, or a municipality.
Nearshore area:	The area extending seaward 12 miles from the boundary lines defined in 46 CFR Part 7, except in the Gulf of Mexico. In the Gulf of Mexico, it means the area extending seaward 12 miles from the line of demarcation (COLREG) lines) defined in d80.740 - 80.850 of Title 33 of the CFR.
Non-persistent or Group I oil:	A petroleum-based oil that, at the time of shipment, consists of hydrocarbon fractions: (1) At least 50% of which by volume, distill at a temperature of 340° C (645° F)

	(2) At least 95% of which by volume, distill at a temperature of 370° C (700° F)
Non-petroleum oil:	Oil of any kind that is not petroleum-based. It includes, but is not limited to, animal and vegetable oils.
Ocean:	The aquatic environment which includes both offshore and nearshore areas.
Offshore area:	The area beyond 12 nautical miles measured from the boundary lines defined in 46 CFR Part 7 extending seaward to 50 nautical miles, except in the Gulf of Mexico. In the Gulf of Mexico it is the area beyond 12 nautical miles of the line of demarcation (COLREG lines) defined in d80-740 - 80.850 of Title 33 of the CFR extending seaward to 50 nautical miles.
Oil or oils:	<u>EPA - Oil Pollution Prevention (40 CFR 112.2)</u> Oil – Means oil of any kind or in any form, including, but not limited to: fats, oils or greases of animal, fish or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil. <u>U.S. Coast Guard – Facility Response Plans (33 CFR 154.105)</u> Oil – Means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, oil mixed with wastes other than dredged spoil. <u>DOT - Response Plans for Onshore Oil Pipelines (49 CFR 194.5)</u> Oil – Means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, vegetable oil, animal oil, sludge, oil refuse, oil mixed with wastes other than dredged spoil.
Oil Spill Removal Organization:	An entity that provides response resources.
Oil Spill Response Contractors:	Persons/companies contracted to undertake a response action to contain and/or clean up a spill.
Oily waste:	Oil contaminated waste resulting from an oil spill or oil spill response operations.
Operating area:	The rivers and canals, inland, nearshore, or offshore geographic location(s) in which a facility is handling, storing, or transporting oil.
Operating environment:	Rivers and canals, inland, or ocean. These terms are used to define the conditions in which response equipment is designed to function.
Owner or operator:	Any person, individual, partnership, corporation, association, governmental unit, or public or private organization of any character.
Person:	Any political subdivision, government agency, municipality, industry,

	public or private corporation, co-partnership, association, firm, individual, or any other entity whatsoever.
Persistent oil:	A petroleum-based oil that does not meet the distillation criteria for a non-persistent oil. Persistent oils are further classified based on specific gravity as follows: (1) Group II—specific gravity less than .85 (2) Group III—specific gravity between .85 and less than .95 (3) Group IV—specific gravity .95 to and including 1.0 (4) Group V—specific gravity greater than 1.0
Plan:	Oil spill response, clean-up, and disposal contingency plan.
Primary response contractors or contractors:	An individual, company, or cooperative that has contracted directly with the plan holder to provide equipment and/or personnel for the containment or clean-up of spilled oil.
Qualified Individual(s):	An English-speaking representative(s) of the facility identified in the plan, located in the United States, available on a 24-hour basis, familiar with implementation of the facility response plan, and trained in his or her responsibilities under the plan. This person must have full written authority to implement the facility's response plan. This includes: (1) Activating and engaging in contracting with identified oil spill removal organization(s) (2) Acting as a liaison with the pre-designated Federal On-Scene Coordinator (FOCS); and (3) Obligating, either directly or through prearranged contracts, funds required to carry out all necessary or directed response activities.
Recreational areas:	Publicly accessible locations where social/sporting events take place.
Regional Response Team:	The federal response organization (consisting of representatives from selected federal and state agencies) which acts as a regional body responsible for planning and preparedness before an oil spill occurs and providing advice to the FOSC in the event of a major or substantial spill.
Response activities:	The containment and removal of oil from the water and shorelines, the temporary storage and disposal of recovered oil, or the taking of other actions as necessary to minimize or mitigate damage to the environment.
Response guidelines:	Guidelines for initial response that are based on the types of product involved in the spill, these guidelines are utilized to determine clean-up methods and equipment.
Response resources:	The personnel, equipment, supplies, and other capability necessary to perform the response activities identified in a response plan.
Responsible Party:	Any person, owner/operator, or facility that has control over an oil or hazardous substance immediately before entry of the oil or hazardous substance into the atmosphere or in or upon the water, surface, or subsurface land of the state.
Restoration:	The actions involved in returning a site to its former condition.

Rivers and canals:	A body of water confined within the inland area that has a projected depth of 12 feet or less, including the Intracoastal Waterway and other waterways artificially created for navigation.
Skimmers:	Mechanical devices used to skim the surface of the water and recover floating oil. Skimmers fall into four basic categories (suction heads, floating weirs, oleophilic surface units, and hydrodynamic devices) which vary in efficiency depending on the type of oil and size of spill.
Sorbents:	Materials ranging from natural products to synthetic polymeric foams placed in confined areas to soak up small quantities of oil. Sorbents are very effective in protecting walkways, boat decks, working areas, and previously uncontaminated or cleaned areas.
Emergency Incident Command Team:	The personnel identified to staff the organizational structure identified in a response plan, and to manage response plan implementation.
Spill Observer:	The first company individual who discovers an oil spill. This individual must function as the responsible person-in-charge until relieved by an authorized supervisor.
Spill response:	All actions taken in responding to spills of oil and hazardous materials including: receiving and making notifications; information gathering and technical advisory phone calls; preparation for and travel to and from spill sites; direction of clean-up activities; damage assessments; report writing, enforcement investigations and actions; cost recovery; and program development.
Spill response personnel:	Federal, state, local agency and industry personnel responsible for participating in or otherwise involved in spill response. All spill response personnel will be pre-approved on a list maintained in the response plan.
Spill Response Team:	Designated company individuals who will fulfill the roles determined in the Facility Response Plan in the event of an oil spill. They will supervise and control all response and clean-up operations.
Staging Areas:	Designated areas near the spill site accessible for gathering and deploying equipment and/or personnel.
State Emergency Response Commission (SERC):	A group of officials appointed by the governor to implement the provisions of Title III of the Federal Superfund Amendments and Reauthorization Act of 1986 (SARA). The SERC approves the State Oil and Hazardous Substance Discharge Prevention and Contingency Plan and Local Emergency Response Plans.
Unified Command:	The method by which local, state, and federal agencies and the responsible party will work with the Incident Commander to: Determine their roles and responsibilities for a given incident. Determine their overall objectives for management of an incident. Select a strategy to achieve agreed upon objectives. Deploy resources to achieve agreed-upon objectives.
Volunteers:	An individual who donates their services or time without receiving

	monetary compensation.
Waste:	Oil or contaminated soil, debris, and other substances removed from coastal waters and adjacent waters, shorelines, estuaries, tidal flats, beaches, or marshes in response to an unauthorized discharge. Waste means any solid, liquid, or other material intended to be disposed of or discarded and generated as a result of an unauthorized discharge of oil. Waste does not include substances intended to be recycled if they are in fact recycled within 90 days of their generation or if they are brought to a recycling facility within that time.
Wildlife rescue:	Efforts made in conjunction with federal and state agencies to retrieve, clean, and rehabilitate birds and wildlife affected by an oil spill.

7.14 Acronyms

ACP: Area Contingency Plan

Alt. Alternate

ANSI: American National Standards Institute

API: American Petroleum Institute

ASME: American Society of Mechanical Engineers

AST: Aboveground storage tank

CFR: Code of Federal Regulations

CORPS: U.S. Army Corps of Engineers

COTP: Captain of the Port

CWA: Clean Water Act (also FWPCA)

DEG: Diethlyene Glycol – Polyester Grade

DHS: Department of Homeland Security

DOT: Department of Transportation

DOW: Dirty, oily water

DOT: Department of Transportation

EAP: Emergency Action Plan

EGAFG: Ethylene Glycol – AFG (for antifreeze blending)

EPA: United States Environmental Protection Agency

ERAP: Emergency Response Action Plan

ERNS: Emergency Response Notification System

FOSC: **Federal On-Scene Coordinator**

FRP: **Facility Response Plan**

FWPCA: **Federal Water Pollution Control Act (also CWA)**

GLO: **Texas General Land Office**

HAZWOPER: **Hazardous Waste Operations & Emergency Response**

ICS: **Incident Command System**

IDLH: **Immediately Dangerous to Life or Health**

ICP: **Integrated Contingency Plan**

JWWTP: **Joint Waste Water Treatment Plant**

MEA: **Methylene Glycol**

MTR: **Marine Transfer—Related**

MOU: **Memorandum of Understanding**

NPDES: **National Pollutant Discharge Elimination System**

NCP: **National Contingency Plan**

NFPA: **National Fire Protection Association**

NPDES: **National Pollutant Discharge Elimination System**

NRC: **National Response Center**

OAQ: **TNRCC Office of Air Quality**

O&O: **Oxides and Olefins**

OJT: **On-the-job Training**

OPA '90: **Oil Pollution Act of 1990**

OSPRA: **Oil Spill Prevention and Response Act**

OWM : **Office of Waste Management**

OSC: **On Scene Coordinator**

OSHA: **Occupational Safety and Health Administration**

OSRO: **Oil Spill Removal Organization**

PNPP: **Port Neches Performance Products**

PO/MTBE: **Propylene Oxide/Methyl-Tert-Butyl Ether**

PE: **Professional Engineer**

PREP: **(National) Preparedness for Response Exercise Program**

QI: **Qualified Individual**

RA: **Regional Administrator**

RCRA: **Resource Conservation and Recovery Act**

RCP: **Regional Contingency Plan**

RSPA: **Research and Special Programs Administration (of DOT)**

RQ: **Reportable quantity**

SOP: **Standard operating procedure**

SPCC: **Spill Prevention Control and Countermeasure**

TEA: **Triethlyanalamine 5%**

TDA: **Texas Department of Agriculture**

TDH: **Texas Department of Health**

TNRCC: **Texas Natural Resource Conservation Commission**

TRC: **Texas Railroad Commission**

UL: **Underwriters Laboratories**

USCG: **United States Coast Guard**

UST: **Underground storage tank**

Glossary of Terms

Aboveground storage tank: any tank or other container that is aboveground, partially buried, bunkered, or in a subterranean vault. This includes floating fuel systems.

Barrel: 42 U.S. gallons at 60 degrees Fahrenheit.

Belowground storage unit: a tank or other container located completely below the natural grade of the earth.

Berms: either dirt, concrete or other constructed embankments that are commonly employed for secondary containment or drainage diversion purposes at oil storage or related operations.

Boom: a temporary floating barrier used to contain an oil spill.

Bulk storage tank: any container used to store oil. These tanks are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce.

Bunkered tank: a storage tank constructed or placed in the ground by cutting the earth and re-covering it such that the tank breaks the natural grade of the land, or an above grade tank covered with earth. A bunkered tank is considered to be an AST and must have secondary containment.

Catch basin: a depression, trench, or pit, which is a collection point for drainage, either water or spilled oil, that provides a means of containment for and prevents the uncontrolled discharge of the collected liquid from a facility or oil storage area.

Cathodic protection: any one of several methods for protecting underground tanks and pipelines from corrosion. Corrosion results from an electric current which is caused by contact between metal surfaces, water, and the chemicals present in soils and water; cathodic protection counteracts this current.

Dike: an embankment or wall that contains drainage water or spilled oil inside the walled area.

Discharge: any emission (other than natural seepage), intentional or unintentional, and includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying or dumping. For purposes of this part, the term "discharge" shall not include any discharge of oil which is authorized by a permit issued pursuant to Section 13 of the River and Harbor Act of 1899 (30 Stat. 1121, 33 U.S.C. 407), or Sections 402 or 405 of the FWPCA Amendments of 1972 (86 Stat. 816 et seq., 33 U.S.C. 1251 et seq.).

Emulsification: the formation of a mixture of two liquids, such as oil and water, in which one of the liquids is in the form of fine droplets and is dispersed in the other.

Evaporation: the physical change by which any substance is converted from a liquid to a vapor or gas.

Facility: any mobile or fixed onshore or offshore building, structure, installation, equipment, pipe, or pipeline used in oil well drilling operations, oil production, oil refining, oil storage, and waste treatment. The boundaries of a facility may depend on several site-specific factors, including, but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and the types of activities at the site.

Facility Response Plan: a detailed plan which must be prepared in accordance with 40 CFR 112.20 by facilities which may cause "substantial harm" to the environment or exclusive economic zone. The plan must contain an emergency response action plan (ERAP) and demonstrate that a facility has the resources to respond to a worst case scenario discharge.

Hydrocarbons: a large class of organic compounds containing only carbon and hydrogen, common in petroleum products.

Impervious: incapable of being penetrated. Secondary containment structures must be sufficiently impervious to the types of products stored within the area of containment.

Incineration: the destruction of wastes by burning at high temperatures.

Inland waters of the United States: those waters of the United States lying inside the baseline from which the territorial sea is measured and those waters outside such baseline which are a part of the Gulf Intracoastal Waterway.

Level gauging systems and alarms: any engineering control that indicates the level of liquid inside the tank and that is installed on tanks to prevent overfilling and spilling of liquid and damage to the tank(s).

Mobile or portable storage tank: any container used to store oil and that is capable of being easily moved. For example, a 55-gallon drum or a 3000-gallon tank on wheels would both be considered mobile storage. These storage containers require secondary containment, which must be addressed in the facility's SPCC Plan.

Mousse: a thick, foamy oil and water mixture formed when petroleum products are subjected to mixing with water by the action of waves and wind.

Natural resources: land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources (including the resources of the exclusive economic zone) belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by, the United States, any state or local government or Indian tribe, or any foreign government.

Navigable waters: the waters of the United States including the territorial seas. This covers:

All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide.

All interstate waters, including interstate wetlands.

All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any waters that could be used for recreational purposes, or from which fish or shellfish could be taken and sold in interstate or foreign commerce; or that are used or could be used for industrial purposes by industries in interstate commerce.

All impoundments of waters otherwise defined as waters of the United States under this section.

Tributaries of waters identified above and wetlands adjacent to waters identified above (other than waters that are themselves wetlands).

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR 123.11(m), which also meet the criteria of this definition) are not waters of the United States.

Offshore facility: any facility located in, on, or under any of the navigable waters of the United States, which is not a transportation-related facility.

Offshore oil drilling, production, or workover facilities: may include all drilling or workover equipment, wells, flowlines, gathering lines, platforms, and auxiliary non-transportation-related equipment and facilities in a single geographical oil or gas field operated by a single operator.

Oil: defined under several statutes including the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). As a result, overlapping regulatory interpretations exist. For this reason, the U.S. EPA and the U.S. Coast Guard are currently developing a nationally consistent program policy and methodology for facilities to determine whether a given substance is considered an oil under the existing CWA.Under the CWA, the definition of oil includes oil of any kind and any form, such as petroleum and nonpetroleum oils. Generally, oils fall into the following categories: crude oil and refined petroleum products, edible animal and vegetable oil, other oils of animal or vegetable origin, and other nonpetroleum oils.

Many substances are easily recognizable as oils (e.g., gasoline, diesel, jet fuel, kerosene, and crude oil). Under the CWA definition, many other substances are considered oils that may not be easily recognizable by industry, including mineral oil, the oils of vegetable and animal origin and other nonpetroleum oils. Therefore, facilities should work closely with the EPA and USCG (if applicable) to make determinations for the substances they store, transfer, and refine.

Oil Removal Contingency Plan: when it is determined that the installation of diversionary structures and equipment listed in 40 CFR Part 112.7.

Specific gravity: the ratio of the density of a substance to the density of water.

Spill event: a discharge of oil into or upon the navigable waters of the United States or adjoining shorelines in harmful quantities, such that applicable water quality standards are violated or that causes a film or sheen upon the water.

Spill history: if a facility has experienced one or more spill events, the SPCC Plan must include a written description of each such spill, corrective actions taken, and plans for preventing its recurrence.

Storage capacity: the volume of a tank or container, for purposes of determining the applicability of 40 CFR Part 112, means the total capacity of the tank or container, whether the tank or container is filled with oil, or a mixture of oil and other substances, or is empty and not permanently closed.

Sump: a depression or trench constructed to collect drainage of water or spilled oil from storage, transfer or unloading areas.

Tank appurtenances: in addition to the tank itself, the additional pieces of equipment necessary to bring the tank into service. Examples of tank appurtenances include, but are not limited to:

- Ladder and gaugers platform.

- Shell manholes.
- Inlet - outlet connections.
- Drawoffs (condensate, water and product).
- Gauge hatch.
- Vent connections.
- Liquid gauges and alarms.

Tar balls: dense, black, sticky spheres of hydrocarbons formed from weathered oil.

Transportation-related: interstate and intrastate onshore and offshore pipeline systems, including pumps and related appurtenances, and in-line or breakout storage tanks needed for the continuous operation of a pipeline system.

Underground storage tank: a tank that is completely covered with soil, situated below the natural grade of the land.

United States: the States, the District of Columbia, the Commonwealth of Puerto Rico, the Canal Zone, Guam, American Samoa, the Virgin Islands, and the Trust Territory of the Pacific Islands.

Valve: a movable mechanism that opens and closes to control the flow of liquid through a pipe or other passageway. Examples of valves include check, ball, and gate.

Vessel: every description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water, other than a public vessel.

Viscosity: the internal properties of a liquid that offer resistance to flow. Substances that are extremely *viscous* do not flow readily.

Weathering: action of the elements on a substance, such as oil, that leads to disintegration or deterioration of the substance.

Wetlands: those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs, prairie potholes, wet meadows, prairie river overflows, mudflats, and natural ponds.

Workover: any of several remedial operations performed on a producing well in an attempt to restore or increase production. Sand or liner removal, casing repair, acidizing, fracture stimulation, cementing, deeper drilling, recompletion to a different producing zone or stratum, and sidetracking are some examples of workover operations.

Facility information Maps And Drawings

1. Area Map
2. Pipeline Aerial
3. O&O Facility Plant Maps (2)
4. PO/MTBE Project Overall Site Plan
5. Bio-diesel Facility Overall Site Plan
6. Bio Diesel Piping to/from Barge
7. Bio Diesel Piping - First Valves inside Secondary Containment
8. Port Neches Joint Wastewater Treatment Facilities Plant Map
9. O&O Facility Dock
10. Pipeline Schematic
11. Site Drainage Map
12. O&O Plant Emergency Staging Areas
13. PO/MTBE Plant Emergency Staging Areas
14. Bio-diesel Facility Emergency Staging Areas

Maps and figures have been redacted in accordance with the FOIA Exemption 7(F).

1.0 -Contact Information

1.1 Owner and Operator—Huntsman, LLC

Address: 10003 Woodloch Forest Drive
The Woodlands, Texas 77380
Phone (713) 235-6000

1.2 Facility—PNPP

Address: 2701 Spur 136
Port Neches, Texas 77651
Phone (409) 722-8381

1.3 Qualified Individuals / Persons in Charge

Name/Position	Office	Cell	Home
Qualified Individual			
Jordan Morgan	(409) 724-4669	(606) 922-0218	(b) (6)
Alternate Qualified Individual			
Martin Novich	(409) 723-3545	(409) 344-3251	(b) (6)

1.4 Huntsman Personnel

Position	Name	Cell	Home
Incident Commander:	Tom Colwell	(409) 344-3449	(b) (6)
Information Officer:	Jordan Morgan	(606) 922-0218	(b) (6)
Human Resources Officer:	Harold Neeley	(409) 893-0069	(b) (6)
Liaison Officer	Mike Miller	(409) 841-4034	(b) (6)
To Fill IC Team Section Vacancies			
For Operations-call	OC (Operations Coordinator)		
For Maintenance –call	MTL (Maintenance Team Leader)		
FOR ALL OTHERS, REFER TO WEEKLY ON DUTY CALL OUT SCHEDULE			
Computer Services			
OCAM Only:	Sam Desmond	(409) 723-0720	(b) (6)

Position	Name	Cell	Home
All Others (IT Help Line): Mark Beard Bryan Collins	Off-Hours Emergency Only	Follow instructions	(b) (6)
Pipelines:	Buckeye Emergency Dispatcher Dhanee Thammasila	N/A (409) 726-7171	(b) (6)
EFSI Contact:	Charlie Bennett George Galindo	(409) 721-7623 (409) 721-1230	(b) (6)

***Paging System-723-3800 + (Four Digits Number)**

1.5 Control Centers

Location	Number
PNPP	(409) 724-2758
Control Conference Room	(409) 724-7628
Admin 2260	(409) 723-3357
	(409) 723-3260

2.0 Incidents

2.1 Fire/ Explosion

Agency	Number
National Response Center	(409) 724-2758
USCG - MSO Port Arthur	(409) 723-6501
Texas Commission on Environment Quality Beaumont Regional Office	(800) 832-824 (409) 898-3838
Jefferson County LEPC	(409) 722-4371
Sabine – Neches Chief's Association	(409) 723-1531
Port Neches Fire Department	(409) 722-5885 Emergency 911
Port Neches Police Department	(409) 722-1424 Emergency 911

2.2 Bomb/Terrorist Threat

Agency	Number
National Response Center	(409) 724-2758
USCG - MSO Port Arthur	(409) 723-6501
FBI – Beaumont	(409) 832-8571
Texas Rangers	(409) 898-0770
Texas Department of Public Safety	(409) 898-0770
Jefferson County LEPC	(409) 722-4371
Jefferson County Sheriff	(409) 835-4371 Emergency 911
Port Neches Police Department	(409) 722-1424 Emergency 911

2.3 Chemical Spill

Agency	Number
National Response Center	(409) 724-2758
USCG - MSO Port Arthur	(409) 723-6501
Texas Commission on Environment Quality Beaumont Regional Office	(800) 832-824 (409) 898-3838
EPA Region 6	(866) 372-7745
Jefferson County LEPC	(409) 722-4371

2.4 OIL Spill

Agency	Number
National Response Center	(409) 724-2758
USCG - MSO Port Arthur	(409) 723-6501
Texas Commission on Environment Quality Beaumont Regional Office	(800) 832-824 (409) 898-3838
EPA Region 6	(866) 372-7745
Jefferson County LEPC	(409) 722-4371
Texas General Land Office	(800) 832-8224

2.5 AIR RELEASE

Agency	Number
National Response Center	(409) 724-2758
Texas Commission on Environment Quality Beaumont Regional Office	(800) 832-824 (409) 898-3838
Jefferson County LEPC	(409) 722-4371

2.6 Pipeline Release

Agency	Number
National Response Center	(409) 724-2758
U.S. Department of Transportation	(800) 424-8802
USCG - MSO Port Arthur	(409) 723-6501
Texas Commission on Environment Quality Beaumont Regional Office	(800) 832-824 (409) 898-3838
EPA Region 6	(866) 372-7745
Texas Railroad Commission	(512) 463-6788
Jefferson County LEPC	(409) 722-4371

Texas General Land Office	(800) 832-8224

2.7 Personal Injury and/or Fatality

Agency	Number
Occupational Safety & Health Administration (OSHA)	(800) 321-6742

3.0 Other Resources

9100 Emergency Notification

A substantial spill of oil usually has a responsible party (RP) who is aware the discharge has occurred; i.e., a vessel grounding or collision, or a tank or pipeline rupture at a facility. The party responsible for a discharge of oil into the navigable waters of the United States is required by federal law to immediately report the discharge to the National Response Center. Time permitting, the parties are recommended to contact the local Coast Guard Sector Office. If the discharge occurs within the jurisdiction of a state, then the RP is required to report it to the appropriate state. The numbers below are provided to help facilitate this process.

NRC USCG	**800-424-8802**
TGLO	**800-832-8224**
LOSCO	**877-925-6595**
LA State Police	**877-925-6595**
MSU Port Arthur	**409-723-6501**
MSU Lake Charles	**337-491-7800**
Sector Houston-Galveston	**713-671-5100**
MSU Galveston	**409-978-2703**
Sector Corpus Christi	**361-888-3162**
TGLO (Nederland)	**409-727-7481**
TGLO (LaPorte)	**281-470-6597**
TGLO (Corpus Christi)	**361-825-3300**
TRRC	**713-869-5001**
LOSCO (Duty pager)	**800-538-5388 pin 129340**
LOSCO (Baton Rouge)	**225-219-5800**

For HAZMAT spills:

NRC USCG	**800-424-8802**
TCEQ:	**409-898-3838 (day)**
	800-832-8224 (after hours)
LA State Police:	**337-491-2850**

9110 Notification Checklist

Date/Time of Notification_____

Reporters Name: _____ **Address:** _____

Phone No: _____ **City:** _____

Company: _____ **State:** _____ **Zip Code:** _____

Title: _____

Latitude: _____ **Longitude:** _____

River Mile: _____

Incident Location:_____

Incident Description:

_____

_____

Source and/or Cause:

_____

_____

Vessel Name and Number: _____

Facility Name: _____

Date of Incident: _____ **Time of Incident:** _____

Material Discharged: _____ **Quantity:** _____

Is the material in the water? _____**(Y/N)** **Is the Source Secured:** _____**(Y/N)**

Incident Commander: _____

Where is Incident Command Post:

_____

Directions:

_____

Actions taken to Correct, Control or Mitigate Incident:

_____

_____

Number of Injuries: _____ **Number of Fatalities:** _____

Were there evacuations?_____**(Y/N)** **Number of Evacuated:** _____

Areas Affected:_____

9200 Personnel and Services Directory

9210 Federal Resources/Agencies

9210.1 Trustees for Natural Resources

9210.11 Department of Interior

DEPARTMENT OF INTERIOR
Dr. Stephen R. Spencer
Office of Environmental Policy and Compliance
1001 Indian School Rd NW, Suite 348
Albuquerque, NM 87104
phone: (505) 563-3572
fax: (505)563-3066
e-mail: Stephen_spencer@ios.doi.gov

U.S. Department of the Interior (DOI) representative to the Region 6 Regional Response Team. Single point of contact for access to DOI bureaus including: U.S. Fish and Wildlife Service, National Park Service, Minerals Management Service, Bureau of Reclamation, Bureau of Land Management, Bureau of Indian Affairs, U.S. Geological Survey, and Office of Surface Mining.

For time critical assistance regarding habitat protection, endangered species or migratory bird issues, either to prevent their contact with oil or to aid in rehabilitation, the U.S. Fish and Wildlife Service may, in addition, be contacted directly.

U.S. FISH and WILDLIFE SERVICE
Ron Brinkley (for Texas)
Contaminants Specialist
17629 El Camino Real, Suite 211
Houston, TX 77058
phone: (281) 286-8282 x245
fax: (281) 488-5882
cell: (713) 542-1873

U.S. FISH and WILDLIFE SERVICE
Buddy Goatcher (for Louisiana)
Contaminants Specialist
646 Cajundome Blvd, Suite 400
Lafayette, LA 70506
phone: (337) 291-3125
fax: (337) 291-3139

9210.2 U. S. Coast Guard

Name:	**Marine Safety Office Port Arthur**
Personnel available:	62 Active, 12 Reservist
Resources available:	USCG pollution response personnel, small boats, and 2000 feet of containment boom for rapid deployment.
Daytime telephone number:	(409) 723-6500
24-hour telephone number:	(409) 723-6501
Address:	2875 Jimmy Johnson Blvd Port Arthur, TX 77640

Name:	**Marine Safety Unit Lake Charles**
Personnel available:	24 Active, 5 Reservist
Resources available:	USCG pollution response personnel, small boats, and 2000 feet of containment boom for rapid deployment.
Daytime telephone number:	(337) 491-7800
24-hour telephone number:	(409) 723-6501
Address:	Marine Safety Unit 150 Marine Street Lake Charles, LA 70601

9210.21 USCG National Strike Force (NSF)

Atlantic Strike Team, Fort Dix, NJ	(609) 724-0008
Gulf Strike Team, Mobile, AL	(251) 441-6601
Pacific Strike Team, Novato, CA	(415) 883-3311.
National Strike Force Coordination Center, Elizabeth City, NC	(252) 331-6000

9210.22 USCG District Response Advisory Team (DRAT)

Commander (imt)

Eighth Coast Guard District	phone:	(504) 671-2231 (daytime)
Hale Boggs Federal Bldg.	phone:	(504) 589-6225 (24 hrs)
501 Magazine Street		
New Orleans, LA 70130-3396		

9210.23 USCG Public Information Assist Team (PIAT)

Eighth District Public Affairs:

PAO	phone:	(504) 671-2019
USCG 8th District (dpa)	fax:	(504) 589-2142
501 Magazine Street	Primary:	(202) 372-4620
New Orleans, LA 70130		

Public Information Assist Team (PIAT):

NSFCC - PIAT	phone:	(252) 331-6000 x3025
1461 US Highway 17 North	fax:	(252) 331-6012
Elizabeth City, NC 27909		

Coast Guard Atlantic Area Public Affairs:

USCG Atlantic Area PA	phone:	(757) 398-6272
431 Crawford Street		(757) 398-6608
Portsmouth, VA 23704-5004	fax:	(757) 398-6238

Coast Guard Commandant's Media Relations Branch:

Media Relations Branch	phone:	(202) 372-4620
USCG Commandant (G-CP-2)		(202) 372-4362
2100 Second Street SW	fax:	N/A
Washington, DC 20593	24 hour:	(202) 372-2100or
		(202) 372-4362

9210.24 USCG Reserve

Unit reserve personnel may be a valuable resource that can be used to augment active duty forces during an event. Reservists could be called upon to assist either as on-scene response personnel or to back-fill positions at the unit, enabling active duty personnel to respond to the event. Unless an involuntary mobilization is ordered, similar to what has happened in the past for recovery efforts following natural disasters, reservists cannot be forced to activate for these events. However, voluntary mobilization of reservists and strategic use of regular IDT drills, ADT, or ADSW-AC to support these events may be an option. Reserve personnel with unique skills such as boat crew, coxswain, and many of the marine safety field qualifications can be force-multipliers on scene. Reservists that have qualifications or other support skills can augment at the unit or fill Incident Command System (ICS) positions. The unit maintains an updated roster of reserve personnel with contact information that can be used to notify reservists for rapid recall following an event.

MSU Port Arthur Senior Reserve Officer

LCDR James Wallace Phone: 504-734-4060

E-Mail: James.Wallace@SPR.DOE.gov

9210.25 USCG Auxiliary

United States Coast Guard

Flotilla 6-11	phone:	(409) 723-6501

United States Air Force Auxiliary (CAP)

Texas Wing	phone:	(281) 341-9744
Louisiana Wing	phone:	(337) 439-9911 admen # for 911
	phone:	(337) 438-0435
24 Hour (CAP HQ)	phone:	(888) 211-1812

9210.3 NOAA

National Marine Fisheries Service

William Jackson	phone:	(409) 766-3699
4700 Ave U	fax:	(409) 766-3575
Galveston, TX 77551		

National Oceanic and Atmospheric Administration
Damage Assessment Center (301) 713-3038
Mr. Doug Helton
WSC 1 Room 425, 6001 Executive Boulevard
Rockville, MD 20852
Mr. Ron Gouguet phone: (562) 980-4080
Pager: (800) 759-7243 PIN #185-4101
24 Hr: N/A
fax: (562) 980-4065

Flower Garden Banks National Marine Sanctuary
G. P. Schmahl cell: (979) 229-6542
216 West 26th Street fax: (409) 621-1316
Suite 104
Bryan, TX 77803

National Oceanic and Atmospheric Administration, Damage Assessment Center
WSC 1 Room 425
6001 Executive Boulevard
Rockville, MD 20582
Phone: (206) 526-4563

National Oceanic and Atmospheric Administration
Mr. James (Jim) Jeansonne
c/o National Marine Fisheries Service
9450 Koger Boulevard
St. Petersburg, FL 33702
Phone: (727) 824- 5391

9210.31 NOAA Scientific Support Coordinator (SSC)

Commander (mssc)
Eighth Coast Guard District phone: (504) 589-4414 or (504) 589-4416
Hale Boggs Federal Bldg. fax: (206) 526-6329
501 Magazine Street 24 hour: (206) 526-6317
New Orleans, LA 70130-3396 (800) Sky-page (pin 5798819)

9210.32 NOAA Discharge and Release Trajectory Modeling

CDR Ken Barton (W): (206) 526-6326
NOAA/NOS/ORCA/HMRAD
7600 Sand Point Way, NE Pager: (800) 759-7243 PIN #2168798
Bin C15700 fax: (206) 526-6329
Seattle, WA 98115-0070 24 Hr: (206) 526-4911
NOAA Hazmat Duty Officer (206) 526-6317

9210.33 NOAA Oceanic and Atmospheric Modeling

Name: National Weather Service (Brownsville, TX to Port Arthur,TX)
Personnel available: As needed
Resources available: Can provide weather forecasting assistance
24-hour telephone number: (830) 606-3617
Address: National Weather Service
830 N.E. Loop 410, Ste 300
San Antonio, TX 78209-1293

Name:	National Weather Service (Port Arthur, TX to Apalachicola, FL)
Personnel available:	As needed
Resources available:	Can provide weather forecasting assistance
24-hour telephone number:	(504) 589-6891
Address:	National Weather Service Old Spanish Trail Slidell, LA 700458

Name:	NOAA Weather Service
Resources available:	Can provide weather forecasting assistance
Daytime telephone number:	(409) 727-1478
Address:	Jefferson County Airport Nederland, TX 77627

9210.4 US Navy Supervisor Salvage (SUPSALV)

Supervisor of Salvage - U.S. Navy
2531 Jefferson Davis Hwy. (202) 781-3889
Arlington, VA 22242-5160 (202) 781-0534
Michael Dean

Army Diving Detachment Assistance
U.S. Army Diving Company (PROV)
Fort Eustis, VA 23604 (757) 878-5780/5658/3500/5604
CG Liaison: SGT. Sanchez fax (757) 878-5675

9210.5 EPA Emergency Response Teams

EPA Response & Prevention Branch
1445 Ross, Mail Code 6SF-R
Dallas, TX 75202 (214) 665-6428

EPA Region 6 Public Affairs:

David Bary	phone:	(214) 665-2208
EPA Region 6 PA	fax:	(214) 665-2118
1445 Ross Avenue	toll free:	(800) 887-6063
Dallas, TX 75202		

9210.6 Agency for Toxic Substance and Diseases (ATSDR)

ATSDR
1600 Clifton Road NE (E-57) phone: (404) 498-0120
Atlanta, GA 30333

9210.7 Weapons of Mass Destruction Teams

U. S. ARMY 6TH WMD/CST

10006 Hanger Drive		(703) 548-2700
Austin Bergstrom International Airport	fax:	(703) 548-2424
Austin, TX 78719		

9210.8 MMS

Lake Jackson District Phone:	phone:	(979) 238-8121(8-5 weekdays)
Oak Park Center	cell:	(979) 292-9334
102 Oak Park drive, Suite 200	fax:	(979) 238-8122
Clute, TX 77531		
Houma District	phone:	(985) 853-5884
3804 Country Drive	cell:	(985) 688-6050
P.O. Box 760	fax:	(985) 879-2738
Bourg, LA 70343-0760		
Lafayette District	phone:	(337) 289-5100
201 Energy Parkway, Suite 410	cell:	(337) 280-0227
Lafayette, LA 70508	fax:	(337) 354-0008
Lake Charles District	phone:	(337) 477-1265
620 Esplanade Street, Suite 200	cell:	(337) 370-2419
Lake Charles, LA 70607 – 2984	fax:	(337) 477-9889
New Orleans District	phone:	(504) 734-6740
990 North Corporate Drive, Suite 100	cell:	(504) 615-0114
New Orleans, LA 70123-3392	fax:	(504) 734-6741
Pipeline Section, Mail Stop 5232 Blvd	phone:	(504) 736-2814 Elmwood Park
New Orleans, LA 70123-2394	cell:	(504) 452-3562
	fax:	(504) 736-2408

9210.9 UDA – APHIS Wildlife Services

Texas Wildlife Services State Director	phone:	(210) 472-5451
Mike Bodenchuck	fax:	(210) 472-5446
P.O. Box 100410		
San Antonio, TX 78201		
Louisiana Wildlife Services	phone:	(225) 389-0229
State Director		
Dwight LeBlanc	fax:	(225) 389-0228
P.O. Box 589		
Port Allen, LA 70767-0589		

9210.10 Miscellaneous Federal Agencies

9210.101 Department of Defense

Gus Marinos
U.S. Army Corps of Engineers (DOD)
P.O. Box 1229
Galveston, TX 77553
(409) 766-3956
(888) 425-7624

MAJ Randy Bland
Headquarters, Fifth Army (DOD)
Attn: AFKB-OP-P
Ft. Sam Houston, TX 78234-7000
(210) 221-2999

Capt. Lonnie Louviere
COMNAVREFOR (Code N01E) (USN – DOD)
4400 Dauphin St.
New Orleans, LA 70146
(504) 678-5711

9210.102 Department of Agriculture

John Roberts
U.S. Forest Service (DOA)
P.O. Box 528804
Oklahoma City, OK 73152
(405) 521-3864
(800) 999-6710 pin 995-1172

9210.103 Department of Energy

William C. Gibson Jr.
Strategic Petroleum Reserve (DOE)
900 Commerce Road East
New Orleans, LA 70123
(504) 734-4200

9210.104 Department of Human and Health Services

CDR Henry Delgado
Dept. of Health & Human Services (DHHS)
1301 Young Street – Suite 1124
Dallas, TX 75202
(214) 767-3879

9210.105 Nuclear Regulatory Commission

Ellis W. Merschoff
Nuclear Regulatory Commission (NRC)
Administrator - Region 4
611 Ryan Plaza Dr., Suite 400
Arlington, TX 76011
(817) 860-8225
(301) 816-5100

9210.106 Federal Law Enforcement

FBI Beaumont	(409) 832-8571
FBI Houston	(713) 693-5000
Customs	(409) 724-0087

9220 State Resources/Agencies

9220.1 Government Official Liaisons

Division of Emergency Management
P. O. Box 4087 (512) 424-2138 (8-5 weekdays)
Austin, TX 78773-0001 (512) 424-2000 (24 hours) DPS

9220.2 Trustees for Natural Resources

9220.21 Texas General Land Office

Name:		Texas General Land Office
Personnel available:		As needed.
Daytime telephone number:		(409) 727-7481
24-hour telephone number:		(800) 832-8224
Address:		2300 Highway 365, Ste 340 Nederland, TX 77627

Austin Headquarters:	phone:	(512) 475-4611
Public Information	fax:	(512) 475-1415
Texas General Land Office		
1700 North Congress #825		
Austin, TX 78701-1496		

Coastal Division	phone:	(512) 475-1464
1700 North Congress Avenue	pager:	(800) 225-0256 PIN #055-0752
Austin, TX 78701-1495	fax:	(512) 465-1560

9220.22 Texas Commission on Environmental Quality (TCEQ)

Galveston Bay Estuary Program:

Program Director	phone:	(281) 218-6461
TCEQ GBEP	fax:	(281) 332-8590
711 Bay Area Blvd #210		
Webster, TX 77598		

Austin Headquarters Public Affairs:

Media Relations	phone:	(512) 239-5544
TCEQ	fax:	(512) 239-5010
PO Box 13087	24-hour:	(512) 239-5000
Austin, TX 78711-3087		

Name:	Texas Commission on Environmental Quality
Personnel available:	As needed.
Resources available:	Air monitoring & Disposal/recycling
Daytime telephone number:	(409) 898-3838
Address:	3870 Eastex Dr, Suite 110 Beaumont, TX 77703

9220.23 Texas Parks and Wildlife Department

Houston Region 4 Office:

Texas Parks and Wildlife Department	Office:	(281) 534-0130
Contact: Winston Denton		(281) 534-0138
1502 Pine Dr.	Pager:	(800) 299-4099 PIN 7859
Dickerson, TX 77539	24Hr:	(512) 389-4848

9220.24 Louisiana Department of Environmental Quality

Name:	Louisiana Department of Environmental Quality
Personnel available:	As needed.
Resources available:	SOSC, assessment and response teams.
Daytime telephone number:	(225) 219-5337
24-hour telephone number:	(866) 896-5337
Address:	3519 Patrick Street, 2nd Floor Lake Charles, LA 70605

9220.25 Louisiana Oil Spill Coordinators Office

Name:	Louisiana Office of Oil Spill Coordinator
Personnel available:	As needed.
Resources available:	Lead agency for Oil spills
Daytime telephone number:	(225) 219-5800 FAX (225) 219-5802
24-hour telephone number:	(800) 538-5388 PIN # 129340
Address:	625 N. Fort St. Baton Rouge, LA 70802

9220.26 Louisiana Wildlife and Fisheries Department

Name:	Louisiana Wildlife and Fisheries Department
Personnel available:	As needed.
Resources available:	Assessment and response assistance.
Daytime telephone number:	(337) 491-2575
Address:	1213 North Lakeshore Drive Lake Charles, LA 70601

9220.27 Louisiana Department of Natural Resources

Department of Natural Resources
Coastal Management Division
625 N. 4th Street
Baton Rouge, LA 70802
(225) 342-8955

9220.3 State Emergency Response Committees (SERC)

TEXAS DEPARTMENT OF PUBLIC SAFETY – DEM
Houston Field Office:
State Coordinating Office
Richard Patterson phone: (713) 967-7000

Regional Liason Officers Managers:
South Texas Regions 2, 3, and 8
Texas Department of Public Safety
12230 West Rd.
Houston, TX 77065 phone: (281) 517-1353

Region 2
District 2A Harris County Office
Contact: Michael Harmon
Texas Department of Public Safety
12230 West Rd.
Houston, TX 77065 phone: (281) 517-1353

District 2A Galveston/Brazoria County Office
Contact:
Texas Department of Public Safety
1325 Amburn Rd. North
Texas City, TX 77591 phone: (514) 242-2000

District 2B Jefferson County Office
Contact: Jay Hall
Texas Department of Public Safety
7200 Eastex Freeway
Beaumont, TX 77708 phone: (409) 924-5427

9220.4 State Environmental Agencies

9220.41 Texas General Land Office

Name:	Texas General Land Office
Personnel available:	As needed.
Daytime telephone number:	(409) 727-7481
24-hour telephone number:	(800) 832-8224
Address:	2300 Highway 365, Ste 340 Nederland, TX 77627

Texas General Land Office	tel: (512) 475-1575
Oil Spill Prevention and Loss	fax: (512) 475-1560
1700 N. Congress Ave., Suite 340	tel: (281) 470-6597
Austin, TX 78701-1495	tel: (800) 832-8224 (24 hr via DPS)

9220.42 Texas Commission on Environmental Quality

Name:	Texas Commission on Environmental Quality
Personnel available:	As needed.
Resources available:	Air monitoring & Disposal/recycling
Daytime telephone number:	(409) 898-3838
Address:	3870 Eastex Dr, Suite 110 Beaumont, TX 77703

Texas Commission on Environmental Quality

Pollution Cleanup Division	tel:	(713) 767-3500 (Houston)
Messinger Bldg. D	fax:	(713) 767-3561
12100 Park 35 Circle		(512) 239-5000(24 hr-Austin)
Austin, TX 78753		(512) 239-2527 (fax)

9220.43 Texas Parks and Wildlife Department

Texas Parks and Wildlife Department

1322 Space Park Drive	tell:	(281) 931-6471
Ste. B-180	fax:	(281) 820-5672 PIN 7859
Houston, TX 77058	Pager:	(800) 299-4099
	24Hr:	(281)842-8100

9220.44 Texas Poison Center

Texas Poison Center phone: (800) 222-1222

9220.45 Railroad Commission of Texas

Railroad Commission
Houston District 3 Office:
District Director: Guy Grossman
Texas Railroad Commission
1706 Seamist Drive, Ste. 501
Houston, TX 77008-3135

phone: (713) 869-5001
fax: (713) 869-9621
24 hr: (512) 463-6788

9220.46 Texas Department of Health

Texas Department of Health
1100 West 49th Street
Austin, TX 78756

phone: (512) 458-7111
(888) 963-7111

TDH - Seafood Safety
950 Washington Blvd.
Beaumont, TX 77705

phone: (409) 838-7100

9220.47 Louisiana Department of Environmental Quality

Name:	Louisiana Department of Environmental Quality
Personnel available:	As needed.
Resources available:	SOSC, assessment and response teams.
Daytime telephone number:	(337) 491-2667
24-hour telephone number:	(888) 763-5424
Address:	1301 Gadwall Street Lake Charles, LA 70615

9220.48 Louisiana Oil Spill Coordinators Office

Name:	Louisiana Office of Oil Spill Coordinator
Personnel available:	As needed.
Resources available:	Lead agency for Oil spills
Daytime telephone number:	(225) 219-5800 FAX (225) 219-5802
24-hour telephone number:	(800) 538-5388 PIN # 129340
Address:	625 N. Fort St. Baton Rouge, LA 70802

9220.49 Louisiana Wildlife and Fisheries Department

Name:	Louisiana Wildlife and Fisheries Department
Personnel available:	As needed.
Resources available:	Assessment and response assistance.
Daytime telephone number:	(337) 491-2575
Address:	1213 North Lakeshore Drive Lake Charles, LA 70601

9220.5 State Historic Preservation Office

Texas Historical Commission
Archeology Division
P. O. Box 12276
Austin, TX 78711-2276

phone: (512) 463-6096
fax: (512) 463-8927

9220.6 State Law Enforcement Agencies

Name:	Texas Dept. Of Public Safety
Personnel available:	As needed
Resources available:	Can provide evacuation assistance
Daytime telephone number:	(512) 424-2000
Address:	Texas Dept. Of Public Safety Beaumont, TX
Name:	Louisiana State Police
Personnel available:	As needed
Resources available:	Can provide crowd/traffic control
Daytime telephone number:	(337) 491-2850
Address:	Louisiana State Police Baton Rouge, LA

9220.7 Hazardous Substances Response Teams

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Emergency Response Hotline (24-hour)
Houston Office (Work Days) (713) 767-3563

Name:	Louisiana State Police
Resources available:	Lead agency for Hazmat releases
Daytime telephone number:	(877) 925-6595
24-hour telephone number:	(225) 925-6595
Address:	Louisiana State Police Baton Rouge, LA 70643

9230 Local Resources/Agencies

9230.1 Local Trustees for Natural Resources

9230.2 Local Emergency Planning Committees

LOUISIANA

Name:	Cameron Parish Emergency Planning Committee
Personnel available:	Hayes Picou
Resources available:	Can provide communications coordination.
Daytime telephone number:	(337) 775-5718
24-hour telephone number:	(337) 775-5718
Address:	American Parish Police Jury Annex Building P.O. Box 366 Cameron, LA 70631

Name:	Calcasieu Parish Emergency Planning Committee
Personnel available:	Mason G. Lindsay
Resources available:	Can provide communications coordination.
Daytime telephone number:	(337) 437-3500
24-hour telephone number:	(337) 437-3500/911
Address:	P.O. Box 1391 Lake Charles, LA 70602-1391

TEXAS

Name:	Beaumont Emergency Management Department
Personnel available:	
Resources available:	Can provide communications coordination
Daytime telephone number:	(409) 880-3901
Address:	P.O. Box 3827 Beaumont, TX 77704

Name:	Jefferson County Local Emergency Planning Coordinator
Personnel available:	John Cascio
Resources available:	Has emergency command post van.
Daytime telephone number:	(409) 726-2513
24-hour telephone number:	(409) 722-4371
Address:	P.O. Box 4025 Beaumont, TX 77704

Name:	Orange County Local Emergency Planning Coordinator
Personnel available:	Chuck Fraser
Resources available:	Emergency communications coordination.
24-hour telephone number:	(409) 882-7895
Address:	Orange County Courthouse Orange, TX 77630

Name:	Orange Director of Emergency Services
Personnel available:	Chuck Frazier
Resources available:	Can provide emergency comms coordination
Daytime telephone number:	(409) 882-7895
Address:	P.O. Box 520, 803 W. Green Ave. Orange, TX 77630

9230.3 Local Environmental Agencies

Name:	Lamar University Hazardous Substance Research Center
Personnel available:	
Resources available:	Scientific support.
Daytime telephone number:	(409) 880-8768
Address:	P.O. Box 10024 Beaumont, TX 77710

Name:	McFaddin Wildlife Refuge
Personnel available:	
Resources available:	Knowledge of Local Area.
Daytime telephone number:	(409) 971-2909
Address:	Clam Lake Road Sabine Pass, TX 77708

Name:	Sea Rim State Park
Personnel available:	
Resources available:	Knowledge of Local Area.
Daytime telephone number:	(409) 971-2559
Address:	P.O. Box 1066 Sabine Pass, TX 77655

Name:	International Bird Rescue
Personnel available:	
Resources available:	Scientific support.
Daytime telephone number:	(707) 207-0380
Address:	699 Potter Street Berkley, CA 94710

Name:	Tri State Bird Rescue
Personnel available:	
Resources available:	Scientific support.
Daytime telephone number:	(302) 737-9543
24-hour telephone number:	(302) 737-7241
Address:	110 Possum Hellon Road Newark, DE 19711

Name:	Wildlife Rehab & Education, Inc.
Personnel available:	Sharon Schmaltz and
Michelle Johnson	
Resources available:	
Daytime telephone number:	(281) 332-8319
24-hour telephone number:	
Address:	951 Power St. League City, TX 77573

9230.4 Law Enforcement Agencies

Name:	Cameron Parish Sheriff's Department
Personnel available:	As needed
Resources available:	Can provide traffic/crowd control
Daytime telephone number:	(337) 775-5111
24-hour telephone number:	(337) 775-5111
Address:	Cameron Parish Sheriff's Department P.O. Drawer A Cameron, LA 70631
Name:	Calcasieu Parish Sheriff's Department
Personnel available:	As needed
Resources available:	Can provide traffic/crowd control
Daytime telephone number:	(337) 491-3600
24-hour telephone number:	(800) 259-3737
Address:	Calcasieu Parish Sheriff's Department 5400 East Broad Street Lake Charles, LA 70601
Name:	Port Arthur Police Department
Personnel available:	As needed
Resources available:	Can provide evacuation assistance
Daytime telephone number:	(409) 983-8611
Address:	Port Arthur Police Department P.O. Box 1089 Port Arthur, TX 77640
Name:	Beaumont Police Department
Personnel available:	As needed.
Resources available:	Can provide evacuation assistance.
Daytime telephone number:	(409) 880-3800
Address:	255 College Beaumont, TX
Name:	Nederland Police Department
Personnel available:	As needed.
Resources available:	Can provide evacuation assistance.
Daytime telephone number:	409) 722-4965
Address:	Nederland Police Department P.O. Box 1165 Nederland, TX 77627
Name:	Orange Police Department
Personnel available:	As needed
Resources available:	Can provide evacuation assistance
Daytime telephone number:	(409) 883-1026
Address:	Orange Police Department P.O. Box 520 Orange, TX 77630

Name:	Bridge City Police Department
Personnel available:	As needed
Resources available:	Can provide evacuation assistance
Daytime telephone number:	(409) 735-5028
Address:	Bridge City Police Department 260 Rachel Bridge City, TX 77611

Name:	Groves Police Department
Personnel available:	As needed
Resources available:	Can provide evacuation assistance
Daytime telephone number:	(409) 962-0244
Address:	Groves Police Department P.O. Box 846 Groves, TX 77619

Name:	Port Neches Police Department
Personnel available:	As needed
Resources available:	Can provide evacuation assistance
Daytime telephone number:	(409) 722-1424
Address:	Port Neches Police Department Port Neches, TX 77651

9230.5 Port Authority/Harbormaster

LOUISIANA

Name:	Lake Charles Harbor and Terminal District
Personnel available:	As needed
Resources available:	Vessel status information
Daytime telephone number:	(337) 439-3661 FAX(337) 493-3523
Address:	P.O. Box AAA Lake Charles, LA 70602

TEXAS

Name:	Beaumont Port Director
Personnel available:	
Resources available:	Information on staging areas
Daytime telephone number:	(409) 835-5367
Address:	P.O. Drawer 2297 Beaumont, TX 77704

Name:	Port of Port Arthur
Resources available:	Information on staging areas
Daytime telephone number:	(409) 983-2029 Fax(409) 985-9312 Fax (409) 985-5555
Address:	P.O. Box 1428 Port Arthur, TX 77641

Name:	Orange Port Director
Personnel available:	
Resources available:	Information on staging areas
Daytime telephone number:	(409) 883-5697
Address:	P.O. Box 516 Orange, TX 77630

9230.6 Fire Departments

LOUISIANA

Name: Grand Lake Louisiana Fire Department
Personnel available: As needed
Resources available: HAZMAT assistance
Daytime telephone number: 911
Address:

Name: Lake Charles Fire Department
Personnel available: As needed
Resources available: Hazmat assistance
Daytime telephone number: (337) 491-1354
Address:

Name: Sulphur Fire Department
Personnel available: As needed
Resources available: Hazmat assistance
Daytime telephone number: (337) 527-4545
Address:

Name: Westlake Louisiana Fire Department
Personnel available: As needed
Resources available: Hazmat assistance
Daytime telephone number: 911
Address:

TEXAS

Name: Beaumont Fire Department
Personnel available: As needed.
Resources available: Hazmat assistance.
Daytime telephone number: (409) 880-3901
24-hour telephone number:
Address: Beaumont Fire Department
P.O. Box 3827
Beaumont, TX 77704

Name: Bridge City Fire Department
Personnel available: As needed. Volunteer force
Resources available: Waterborne assessment assistance
Daytime telephone number: (409) 735-2419
Address: Bridge City Fire Department
P.O. Box 142
Bridge City, TX 77611

Name: Groves Fire Department
Personnel available: As needed
Resources available: Hazmat assistance
Daytime telephone number: (409) 962-4469
Address: Groves Fire Department
P.O. Box 846
Groves, TX 77619

Name:	Nederland Fire Department
Personnel available:	As needed
Resources available:	Hazmat assistance
Daytime telephone number:	(409) 723-1531
Address:	Nederland Fire Department P.O. Box 967 Nederland, TX 77627

Name:	Orange Fire Department
Personnel available:	As needed
Resources available:	Hazmat assistance
Daytime telephone number:	(409) 883-1078
Address:	Orange Fire Department P.O. Box 520 Orange, TX 77630

Name:	Port Neches Fire Department
Personnel available:	As needed
Resources available:	Waterborne assessment assistance
Daytime telephone number:	(409) 722-5885
Address:	Port Neches Fire Department 1209 Merriman Port Neches, TX 77651

9230.7 Hazardous Substances Response Teams

(b) (7)(F) [redacted]

Houston, TX 77019

9230.9 Site Safety Personnel/Health Departments

LOUISIANA

Name:	Cameron Parish Emergency Planning Committee
Personnel available:	Hayes Picou
Resources available:	Can provide communications coordination.
Daytime telephone number:	(337) 775-5718
24-hour telephone number:	(337) 775-5718
Address:	American Parish Police Jury Annex Building P.O. Box 366 Cameron, LA 70631

Name:	Calcasieu Parish Emergency Planning Committee

Personnel available:	Mason G. Lindsay
Resources available:	Can provide communications coordination.
Daytime telephone number:	(337) 437-3500
24-hour telephone number:	(337) 437-3500/911
Address:	P.O. Box 1391 Lake Charles, LA 70602-1391

TEXAS

Name:	Beaumont Emergency Management Department
Personnel available:	
Resources available:	Can provide communications coordination
Daytime telephone number:	(409) 880-3901
Address:	P.O. Box 3827 Beaumont, TX 77704

Name:	Jefferson County Local Emergency Planning Coordinator
Personnel available:	John Cascio
Resources available:	Has emergency command post van.
Daytime telephone number:	(409) 835-8411
24-hour telephone number:	N/A
Address:	P.O. Box 4025 Beaumont, TX 77704

Name:	Orange County Local Emergency Planning Coordinator
Personnel available:	Chuck Fraser
Resources available:	Emergency communications coordination.
Daytime telephone number:	(409) 883-6262 fax
Address:	Orange County Courthouse Orange, TX 77630

Name:	Orange Director of Emergency Services
Personnel available:	Chuck Frazier
Resources available:	Can provide emergency comms coordination
Daytime telephone number:	(409) 882-7895
Address:	P.O. Box 520, 803 W. Green Ave. Orange, TX 77630

9240 Private Resources

9240.1 Clean-up Companies (BOA & Non-BOA)

LOUISIANA

Mailing address:	Texas Environmental Resources 1600 Spindle Top Rd Beaumont, TX 77705
Point of contact:	Billy Derouen
24-hour telephone number:	(409) 833-3596
BOA:	Yes

Mailing address:	ASCO Environmental Services (Previously L&L Environmental) 307 Bunker Road Lake Charles, LA 70615
Point of contact:	David Zachary
Daytime telephone number:	(337) 436-6385 FAX (337) 439-6343
BOA:	Yes

Mailing address:	Miller Environmental Services 2208 Industrial Drive Sulphur, LA 70665
Point of contact:	Charles Keenan
Daytime telephone number:	(337) 882-9800 FAX (337) 882-9801
24-hour telephone number:	(800) 207-9403
BOA:	Yes

Mailing address:	Marine Spill Response Corporation 901 Lake Shore Drive, Ste 900 Lake Charles, LA 70601
Point of contact:	Sam Russell or dispatcher on call
24-hour telephone number:	(337) 475-6400
24-hour telephone number:	(800) 256-6772 (local)
24-hour telephone number:	(800) 259-6772 (national)
BOA:	None, contracts per case

TEXAS

Mailing address:	Clean Channel Association, Inc. 3110 Pasadena Fwy Pasadena, TX 77503
Point of contact:	S. P. Glenn
Daytime telephone number:	(713) 534-6195
BOA:	Yes

Mailing address:	Garner Environmental Services 5048 Houston Ave Port Arthur, TX 77640
Point of contact:	Elbert Sirmons
Daytime telephone number:	(409) 983-5646
24-hour telephone number:	(800) 983-7634
BOA:	Yes

Mailing address:	Pneumatic 5048 Houston Ave Orange, TX 77640
Point of contact:	Chris Hyde
Daytime telephone number:	N/A
24-hour telephone number:	(409) 745-9100
BOA:	Yes

Mailing address:	National Response Corp 11200 Richmond Ave. Houston, TX 77082
Point of contact:	Mike Noel
Daytime telephone number:	N/A
24-hour telephone number:	(800) 899-4672 or
Non-emergency:	(631) 224-9141
BOA:	Yes

Mailing address:	Oil Mop Inc. LLC 5215 Twin City Hwy, Suite B Port Arthur, TX 77642
Point of contact:	Joe Hollis
Daytime telephone number:	(409) 962-7226
24-hour telephone number:	(800) 654-6671
BOA:	Yes

Mailing address:	Clean Harbor P. O. Box 5618 Port Arthur, TX 77640
Point of contact:	David McCoy
Daytime telephone number:	(409) 796-1388
24-hour telephone number:	(800) 645-8265
Fax:	(409) 796-1133
BOA:	Yes

9240.2 Media (Television, Radio, Newspaper)

WIRE --
N/A

TELEVISION --

KJAC CHANNEL 4	409-985-5557	FAX 409-899-4639
KBMT CHANNEL 12	409-833-7512 (8-5) 409-838-1212 (24 hrs)	FAX 409-833-4007
KFDM CHANNEL 6	409-892-6622	FAX 409-892-7305
KFOX CHANNEL 29	337-474-1316	FAX 337-477-6795
KPLC CHANNEL 7	337-437-7568	FAX 337-439-9905

RADIO --
TEXAS:

KLVI/KYKR	409-896-5555	FAX 409-896-5599
KQXY	409-833-9421	FAX 409-833-9296
KQHN	409-833-9421	FAX 409-866-5500
KTRH	N/A	FAX 713-630-3666
KUHF	713-747-8127	FAX 713-748-1212

LOUISIANA:		
KYKZ	337-439-3300	FAX 337-439-3360
KTQQ	337-436-1013	FAX 337-436-7278

NEWSPAPER --

SOUTHEAST TEXAS:		
PORT ARTHUR NEWS	409-729-6397	FAX 409-982-4903
BEAUMONT ENTERPRISE	409-838-2872	FAX 409-880-0757
ORANGE LEADER	409-883-3571	FAX 409-883-6342
LAKE CHARLES:		
AMERICAN PRESS	337-494-4068	FAX 337-494-4070

9240.3 Fire Fighting/Salvage Companies/Divers

9240.31 Fire Fighting

WILD WELL CONTROL INC.
22730 Gosling Road, phone: (281) 784-4700
Spring, TX 77389 fax: (281) 784-4750

WILLIAMS FIRE & HAZARD CONTROL, INC.
1675 Texla Road phone: (409) 727-2347
Vidor, TX 77662 fax: (409) 745-3021
emergency: (281) 999-0276

9240.32 Salvage Companies/Divers

T&T MARINE SALVAGE, INC.

9723 Teichman Road	Office:	(409) 744-1222
Galveston, TX 77554	Fax:	(409) 744-5218
Contact: Rudy Teichman	Houston:	(281) 488-5757
Personnel on Staff: 12	24 hr:	(409) 643-6388

BISSO MARINE COMPANY, INC.

P. O. Box 4113	Office:	(800) 752-4776
New Orleans, LA 70178		(504) 866-6341
Personnel on Staff: 80	Fax:	(504) 865-8132
Contact: Cappy Bisso		

SMIT INTERNATIONAL AMERICAS, INC.

400 N. Sam Houston Parkway East Suite, 310	Office	(281) 372-3500
Houston, TX 77060	Fax	(281) 372-3525

INDUSTRIAL TERMINAL

14035 Industrial Road	Office	(713) 450-8888
Houston, TX 77015	Fax	(713) 450-8828

DONJON MARINE CO., INC.

1250 Liberty Ave.	Office:	(908) 964-8812
Hillside, N.J. 07205	Fax:	(908) 964-7426
Contact: Steven Newes		

Donjon Marine has the current U.S. Navy Salvage Contract that includes the USGOM.

SALVAGE MASTERS / CONSULTANTS

THOMAS K. FLESNER LLC

8524 Hwy. 6 N #213	Office:	(281) 744-5729
Houston, TX 77095	Fax:	(281) 345-0339
Contact: Tom Flesner		

U.S. NAVY SUPERVISOR OF SALVAGE (SUPSALV)

2531 Jefferson Davis Hwy.	Office:	(202) 781-1731
Arlington, VA 22242-5160	Fax:	(202) 781-4588
Contact: Duty Officer	Emergency:	(202) 781-3889

U.S. COAST GUARD MARINE SAFETY CENTER

Salvage Engineering Response Team (SERT)		
400 Seventh St. SW	Office:	(800) 323-7233
Washington, DC 20590		(202) 366-6484
Contact: Duty Officer	Fax:	(202) 366-3877

9240.33 Divers

T&T MARINE SALVAGE

9723 Teichman Rd.	Office:	(409) 744-1222
Galveston, TX 77554	Fax:	(409) 744-5218
Contact: Rudy Teichman	24 Hour:	(409) 643-6388
Houston:		(281) 488-5757

SUPERIOR DIVING CO.
9302 Lambright
Houston, TX 77075
Contact: Mike Rentfro
Office: (713) 910-1873
Fax: (713) 910-1881

ORION CONSTRUCTION INC.
12550 Fuqua
Houston, TX 77034
Contact: Mark Coyle
Office: (713) 852-6500
Fax: (713) 852-6580

SEAMAR DIVERS, INC.
13401-A Murphy Rd.
Stafford, TX 77477
Contact: Eloy Anaya
Office: (281) 208-2522
Fax: (281) 208-2524

SHIP TO SHORE DIVING SERVICE
13449 FM 1764 Rd.
Santa Fe, TX 77510
Contact: Fred Schepp
Office: N/A
Houston: (281) 337-4427
Fax: (409) 925-4877

S & J DIVING, INC.
P. O. Box 34413
Houston, TX 77234
Contact: David Ballard
Office: (281) 487-4287
Fax: (281) 487-4280

BISSO MARINE CO., INC.
P.O. Box 4113
New Orleans, LA 70178
Contact: Kelly Steele
Office: (504) 866-6341
(800) 752-4776
Fax: (504) 865-8132

CAL DIVE INTERNATIONAL
1550 Youngs Rd.
Morgan City, LA 70380
Contact: Scott Coker
Office: (504) 330-0300
Fax: (504) 330-0394

SUPERIOR DIVING CO.
221 Gunther Lane
Belle Chasse, LA 70037
Contact: Mike Luistra
Office: (504)-393-1596
Fax: (504) 393-1828

H. J. MERRIHUE
P.O. Box 23123
New Orleans, LA 70123
Contact: Chad Byard
Office: (504) 466-2800
Fax (504) 466-9850

EPIC DIVERS, INC.
1841 Enterprise Dr.
Harvey, LA 70058
Contact: Mike Brown
Office: (800) 844-3742
(504) 340-5252
Fax: (504) 340-5416

9240.4 Fishing Cooperatives and Fleets

Texas Shrimp Association
P. O. Box 1020
Aransas Pass, TX 78335
phone: (361) 758-5024
fax: (361) 758-5853

9240.5 Wildlife Rescue Organizations

WILDLIFE REHAB AND EDUCATION
Sharon Schmalz — pager: (713) 643-1417 (Oil Spill Only)
Oiled Wildlife Response Team — fax: (281) 481-3727
951 Power Street
League City, TX 77573
E-mail: schmalz@icct.net

ANAHUAC NATIONAL WILDLIFE REFUGE
P. O. Box 278 — phone: (409) 267-3337
Anahuac, TX 77514 — fax: (409) 267-4314

UNITED STATES FISH AND WILDLIFE SERVICE
Brazoria and San Bernard
National Wildlife Refuges — phone: (505) 248-6911
1212 N. Valasco, Suite 200
Angleton, TX 77515

GALVESTON BAY FOUNDATION
17324-A Highway 3 — phone: (281) 332-3381
Webster, TX 77598

GULF COAST CONSERVATION ASSOCIATION
6919 Port West Dr., Suite 100 — phone: (713) 626-4222
Houston, TX 77024 — fax: (713) 461-2911

SIERRA CLUB
160 BIRDSILLE, #34 — pone: (713) 521-3981
HOUSTON, TX 77007

TEXAS WILDLIFE REHABILITATION COALITION — phone: (713) 468-8972
595 Wyeliffe
Houston, TX 77079

TEXAS MARINE MAMMAL STRANDING NETWORK — phone: (409) 744-1358

Name:	Texas Oiled Wildlife Response Program
Resources available:	Can provide bird cleaning services
Daytime telephone number:	(409) 740-4728
Address:	P.O. Box 1675 Galveston, TX 77553-1675

9240.6 Volunteer Organizations

Name:	Wildlife Rehab and Education Inc.
Daytime telephone number:	(713) 861-9453 (8am -6pm)
Address:	951 Power St. League City, TX 77573

Name:	American Red Cross, Beaumont, TX
Resources available:	Can provide refreshment vans
Daytime telephone number:	(409) 832-1644
Address:	706 Magnolia Beaumont, TX 77701

Name:	American Red Cross, Orange, TX
Daytime telephone number:	(409) 883-2322
24-hour telephone number:	1-800-448-1327
Address:	908 W. Pine Orange, TX 77630

Name:	Salvation Army, Beaumont, TX
Resources available:	Can provide emergency shelter.
Daytime telephone number:	(409) 896-2361
Address:	P.O. Box 37062 Beaumont, TX 77704

Name:	Salvation Army, Port Arthur, TX
Resources available:	Can provide emergency shelter
Daytime telephone number:	(409) 983-2229
Address:	PO Box 368 Port Arthur, TX 77640

Name:	Salvation Army, Orange, TX
Resources available:	Can provide emergency shelter
Daytime telephone number:	(409) 883-4232
Address:	P.O. Box 456 2515 N 3rd St. Orange, TX 77630

9240.7 Maritime Associations/Organizations/Cooperatives

9240.71 Marine Pilot Associations

LOUISIANA

Name:	Lake Charles Pilots, Inc.
Personnel available:	As needed
Resources available:	Vessel status and waterway information
Daytime telephone number:	(337) 436-0372
Address:	710 West Prien Lake Road, Ste 201 Lake Charles, LA 70601

TEXAS

Name:	Sabine Pilots Association
Personnel available:	
Resources available:	Vessel status and waterway Information
Daytime telephone number:	
24-hour telephone number:	(409) 722-1141
Address:	5148 W. Parkway Groves, TX 77619

9240.72 Environmental Interest Groups

Name:	Sierra Club
Personnel available:	
Daytime telephone number:	(713) 521-3981
Address:	133 Berkshire Lane Beaumont, TX 77705
Name:	Clean Air and Water Inc. (Citizens Environmental Organization)
Personnel available:	
Daytime telephone number:	(866) 896-5337
Address:	750 Wade St. Beaumont, TX 77706
Name:	Louisiana Geological Survey
Personnel available:	As needed
Resources available:	Can provide assessment assistance
Daytime telephone number:	(225) 578-5320
Address:	Box G, University Station Baton Rouge, LA 70893-4107
Name:	Sabine National Wildlife Refuge
Personnel available:	
Resources available:	Provides assessment of local area
Daytime telephone number:	(337) 762-3816
Address:	Highway 27 South Hackberry, LA 70645
Name:	Texas A & M University Spill Research
Personnel available:	
Resources available:	Provides guidance on dispersants
Daytime telephone number:	(979) 845-3211
Address:	Texas A & M University College Station, TX 77843-3136
Name:	C-K Associates
Personnel available:	
Resources available:	Chemical analysis
Daytime telephone number:	(225) 752-8062
Address:	17170 Perkins Road Baton Rouge, LA 70810-3817
Name:	Institute for Environmental Studies at LSU
Personnel available:	
Resources available:	Chemical analysis and scientific support
Daytime telephone number:	(225) 578-3202
Address:	Louisiana State University 42 Atkinson Hall Baton Rouge, LA 70803

9240.8 Academic Institutions

TEXAS A&M CENTER FOR MARINE TRAINING & SAFETY (TEEX)
Texas A&M (TEEX) phone: (409) 740-4462
87101 Tiekman Road fax: (409) 744-2890
Galveston, TX 77554
E-mail: cmgiesen@teexnet.tamu.edu

9240.9 Laboratories

Precision Petroleum Labs, Inc. (FINGERPRINT ANALYSIS)
5915 Star Lane phone: (713) 680-9425
Houston, Texas 77057 fax: (713) 680-9564

Name:	E.I. DuPont
Personnel available:	
Resources available:	Chemical analysis
Daytime telephone number:	(409) 886-6442
24-hour telephone number:	
Address:	P.O. Box 1089 Orange, TX 77630

Name:	IHI-Kemron
Personnel available:	
Resources available:	Chemical analysis
Daytime telephone number:	(409) 727-1661
24-hour telephone number:	
Address:	1216 Port Neches Avenue Port Neches 77651

Name:	Texas Environmental
Personnel available:	
Resources available:	Chemical analysis
Daytime telephone number:	(512) 239-1000
24-hour telephone number:	
Address:	1045 Boston Avenue Nederland, TX 77627

9240.10 Emergency Medical Services

AMBULANCE SERVICES

Louisiana

Acadian Ambulance Service	Lake Charles	(800) 259-1111
West Cal-Cam Hospital Ambulance	Sulphur	(337) 527-9999

Texas

Air Ambulance		(800) 631-6565
Metrocare EMS	Beaumont	(325) 691-8906
Orange County Ambulance Service	Bridge City	(409) 883-6414
Diamond Emergency Medical	Port Arthur	(409) 985-5911
EMS USA	Port Neches	(409) 729-1846

HOSPITALS

Louisiana

Name:	Cameron Hospital, Creole, LA
Personnel available:	
Telephone number:	(337) 542-4111
Address:	5360 W. Creole Hwy Creole, LA

Name:	Lake Charles Memorial Hospital
Personnel available:	
Telephone number:	(337) 494-3000
Address:	1701 Oak Park Blvd Lake Charles, LA

Name:	West Calcasieu-Cameron Hospital, Personnel available:
Telephone number:	(337) 527-7034
Address:	701 E. Cypress St Sulphur, LA

Name:	St. Patrick's Hospital, Lake Charles, LA
Personnel available:	
Telephone number:	(337) 436-1111
24-hour telephone number:	(337) 436-2511
Address:	524 S. Ryan St. Lake Charles, LA 70601

Texas

Name:	Mid-Jefferson Hospital
Personnel available:	(409) 784- 7389
Telephone number:	(409) 727-2321
Address:	Hwy 365 at 27th Street Nederland, TX 77627

Name:	Park Place Medical Center
Personnel available:	
Telephone number:	(409) 983-4951
Address:	3050 39th Street Port Arthur, TX 77640

Name:	St. Mary Hospital
Personnel available:	
Telephone number:	(409) 985-7431
Address:	3600 Gates Boulevard Port Arthur, TX 77640

Name:	St. Elizabeth Hospital
Personnel available:	
Telephone number:	(409) 899-7000
Address:	2830 Calder Avenue Beaumont, TX 77702

Name:	Baptist Beaumont Hospital
Personnel available:	
Telephone number:	(409) 835-3781
Address:	College and 11th Street

	Beaumont, TX 77702
Name:	Baptist Orange Hospital
Personnel available:	
Telephone number:	(409) 883-9361
Address:	608 Strickland Orange, TX 77630

9240.11 Safety Equipment

CLOTHING

Type of equipment:	Nomex safety apparel
Quantity:	As needed
Availability restrictions:	Rentals and sales, will open after hours for emergencies
Location:	Beaumont, TX
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	JoAnn Pippin, Manager
Daytime telephone number:	(409) 832-3434 (800) 666-8676 (409) 832-9373
Mailing address:	Munro's Safety Apparel 1499 Broadway Beaumont, TX 77701

Type of equipment:	Protective clothing and safety equipment
Quantity:	As needed
Equipment capabilities:	
Availability restrictions:	Large inventory on hand
Location:	Lake Charles, LA
Response times:	0730 to 1630
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Elridge Handy, Sales Manager
Daytime telephone number:	(337) 436-7538
24-hour telephone number:	(337) 436-3346 FAX
Mailing address:	Safety House, Lake Charles Pipe & Supply 2010 Enterprise Blvd Lake Charles, LA 70602

SAFETY EQUIPMENT

Type of equipment:	Safety equipment
Quantity:	As needed
Equipment capabilities:	
Availability restrictions:	Large inventory on hand
Location:	Lake Charles, LA
Response times:	0730 to 1630
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Elridge Handy, Sales Manager
Daytime telephone number:	(337) 436-7538
24-hour telephone number:	(337) 436-3346 FAX
Mailing address:	Safety House, Lake Charles Pipe & Supply 1228 Broad Street Lake Charles, LA 70602

Type of equipment:	Safety equipment
Quantity:	As needed
Equipment capabilities:	Nomex suits, rainwear, rubber boots, Wilson Safety equipment
Availability restrictions:	Large inventory on hand
Location:	Lake Charles, LA
Response times:	8-5 M thru F, 8-12 Saturday
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Cecil Fritz
Daytime telephone number:	(337) 433-5361
24-hour telephone number:	(337) 436-3697 FAX
Mailing address:	U-Tech 1432 Broad Street Lake Charles, LA 70601

Type of equipment:	Safety equipment
Quantity:	As needed
Equipment capabilities:	Nomex suits, rainwear, rubber boots, Wilson Safety equipment
Availability restrictions:	Large inventory on hand
Location:	Lake Charles, LA
Response times:	7-5 M to F, on 24 hour call
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Russell Guidry
Daytime telephone number:	(337) 433-5744
24-hour telephone number:	(337) 436-3960 FAX
Mailing address:	Fire Safety Sales & Service 130 N. Ryan Lake Charles, LA 70602

Type of equipment:	Safety equipment
Quantity:	As needed
Equipment capabilities:	Nomex suits, rainwear, rubber boots, Wilson Safety equipment
Availability restrictions:	Large inventory on hand
Location:	Lake Charles, LA
Response times:	Service 24 hours a day
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Mike Halay
Daytime telephone number:	(337) 433-1002
24-hour telephone number:	(337) 436-8289 FAX
Mailing address:	Lake Charles Rubber Company 930 3rd Avenue Lake Charles, LA 70602

Type of equipment:	Personal Protective Equipment
Quantity:	As needed
Equipment capabilities:	Clothes, gloves, hearing protection, hard hats, helmets, disposable items.
Availability restrictions:	Delivery available.
Location:	Orange, TX
Response times:	
Support needed:	

Owner and affiliation:	Commercial
Point of contact:	Karl Krog
Daytime telephone number:	(409) 886-7164
24-hour telephone number:	(
Mailing address:	Express Supply 87 Main Orange, TX 77630
Type of equipment:	Protective Equipment
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Beaumont, TX
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 842-5040
24-hour telephone number:	
Mailing address:	Vallen Safety Supply Company 1375 W Cardinal Dr. Beaumont, TX 77705

9250 Stakeholders

Texas

U.S. Fish and Wildlife
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
Phone: 281-286-8282

McFaddin National Wildlife Refuge
Texas Point National Wildlife Refuge
P.O. Box 609
Sabine Pass, TX 77655
Phone: 409-971-2909
Fax: 409-971-2104

Regional Office
Texas Parks and Wildlife
1502 Pine Drive
Dickerson, TX 77539
POC: Weston Denton
Phone: 281-534-0130
24 hr: 512-389-4848

Wildlife Management Areas:
Lower Neches WMA
Tony Houseman WMA
Candy Cain Adshire WMA
JD Murphree WMA

POC: Jim Sutherlin
Texas Parks and Wildlfe
10 Parks and Wildlife Dr
Port Arthur, TX 77640
Phone: 409-736-2551

State Parks:
Sea Rim State Park
Sabine Pass Battleground State Park and Historic Site

POC: Texas Parks and Wildlife
P.O. Box 1066
Sabine Pass, TX 77655
Phone: 409-971-2559

Louisiana

U.S. Fish and Wildlife
646 Cajundome Blvd, Suite 400
Lafayette, LA 70506
Phone: 337-291-3100
Fax: 337-291-3139

Sabine National Wildlife Refuge
3000 Holly Beach Hwy
Hackberry, LA 70645
Phone: 337-762-3816
Fax: 337-762-3780

Cameron Prairie National Wildlife Refuge
1428 Hwy 27
Bell City, LA 70630
Phone: 337-598-2216
Fax: 337-598-2492

Lacassine National Wildlife Refuge
209 Nature Rd
Lake Arthur, LA 70549
Phone: 337-774-5923
Fax: 337-774-9913

9260 Miscellaneous Contacts

9260.1 Lightering

AMERICAN EAGLE TANKERS AGENCIES
1900 West Loop South, Suite 920 24hr: (713) 622-1590
Houston, TX 77027 Fax: (713) 622-2256
Email: aet-hou@aetweb.com Backline: (713) 622-6436

AET AMERICAN EAGLE TANKERS
1301 Pelican Island, Block #2
Galveston, TX 77554 Phone: (409) 740-0949

SKAUGEN PETROTRANS, INC.
5847 San Felipe, Suite 3150 Phone: (713) 266-8000
Houston, TX 77057 Fax: (713) 266-0309

9260.2 Towing Companies

BUFFALO MARINE SERVICE
8201 E. Erath Street 24hr Phone: (713) 923-5571
Houston, TX 77012 Fax: (713) 923-5304

HIGMAN TOWING COMPANY
1980 Post Oak Blvd., #1101 Phone: (713) 552-1101
Houston, TX 77056 Fax: (713) 552-0732

KIRBY INLAND MARINE INC.
55 Waugh Drive 24 Hr: (713) 435-1000
Houston, TX 77061 Fax: (713) 435-1464

ACBL
P.O. Box 610 24 Hr: (877) 857-1225
Jeffersonville, IN 47131 Fax: (812) 288-1766

STAPP TOWING COMPANY, INC.
P. O. Box 325 Phone: (281) 337-2551
Dickinson, TX 77539 Fax: (281) 337-4108

9260.3 Railroad Emergency Contacts

Union Pacific Railroad	(888) 877-7267
Burlington Northern/Santa Fe Railroad	(800) 832-5452
Kansas City Southern Railroad	(800) 892-6295
Texas Mexican Railroad	(956) 728-6700

9260.4 Utility Companies

Electric: Entergy phone:
Contact: Vernon Pierce cell:
24 Hr. Emergency (800) ENTERGY (368-3749)
Telephone: Southwestern Bell phone: (800) 464-7928

9260.5 Command Posts

TEXAS

Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector, lodging and food
Location:	Port Arthur, TX
Owner:	Holiday Inn
Telephone number:	(877) 863-4780

Mailing address:	Holiday Inn 2929 Jimmy Johnson Blvd. Port Arthur, TX 77642
Space Available:	5,000 square feet
Equipment capabilities:	Microphone, overhead projector
Location:	Nederland, TX
Owner:	Southeast Texas Regional Airport
Telephone number:	(409) 722-0251
Mailing address:	Southeast Texas Regional Airport 5000 Jerry Ware Dr. Beaumont, TX 77705
Space Available:	8,000 square feet
Equipment capabilities:	
Location:	Port Neches, TX
Owner:	City of Port Neches
Telephone number:	(409) 727-2182
24-hour telephone number:	(409) 722-5885
Mailing address:	Wright Building 1006 Port Neches Blvd. Port Neches, TX 77651
Space Available:	5,000 square feet
Equipment capabilities:	
Location:	Port Neches, TX
Owner:	National Guard Armory
Telephone number:	(409) 727-0431
24-hour telephone number:	(409) 989-3900 pin 597
Mailing address:	Texas National Guard 511 Grigsby Port Neches, TX 77651
Space Available:	3000 square feet
Equipment capabilities:	Microphone, overhead projector
Location:	Nederland, TX
Owner:	TX Air National Guard
Telephone number:	(817) 852-3326
Mailing address:	Tx Air National Guard 2929 Airport Blvd. Nederland, TX 77642
Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector
Location:	Port Arthur, TX
Owner:	Port Arthur Civic Center
Telephone number:	(409) 985-8801
Mailing address:	Civic Center 3401 Cultural Center Dr. Port Arthur, TX 77640
Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	
Location:	Beaumont, TX
Owner:	U.S. Army Reserve Ctr.
Telephone number:	(501) 771-8722

Mailing address:	U.S. Army Reserve Ctr. 3020 College St. Beaumont, TX 77730
Space Available:	5,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	
Location:	Port Arthur, TX
Owner:	Ramada Inn
Telephone number:	(409) 962-9858
Mailing address:	Ramada Inn 3801 Hwy 73 Port Arthur, TX 77632
Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	
Location:	Beaumont, TX
Owner:	Beaumont Civic Center
Telephone number:	(409) 838-3435
Mailing address:	Civic Center 801 Main Beaumont, TX 77642
Space Available:	5,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	
Location:	Beaumont, TX
Owner:	Hilton
Telephone number:	(409) 842-5646
Mailing address:	Hilton Beaumont 2355 I-10 South Beaumont, TX 77705
Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	Depends on School Session
Location:	Beaumont, TX
Owner:	Lamar University
Telephone number:	(409) 880-8311/8307
Mailing address:	Lamar University 4400 MLK Blvd. Beaumont, TX 77730
Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	Depends on School Session
Location:	Orange, TX
Owner:	Lamar State College-Orange
Telephone number:	(409) 883-7750
Mailing address:	Lamar State College-Orange 410 Front St. Orange, TX 77630
Space Available:	10,000 square feet
Equipment capabilities:	Microphone, overhead projector
Availability restrictions:	Depends on School Session

Location:	Orange, TX
Owner:	West Orange Cove ISD
Telephone number:	(409) 882-5437
Mailing address:	West Orange Cove ISD 505 15th St. Orange, TX 77630

LOUISIANA

Space Available:	78,965 square feet
Equipment capabilities:	Microphone, overhead projector Three banquet rooms, theater, exhibition hall
Availability restrictions:	
Location:	Lake Charles, LA
Owner:	Lake Charles Civic Center
Point of Contact	Shiela Guidry
Telephone number:	(337) 491-1256
Mailing address:	Civic Center PO Box 900 Lake Charles, LA 70602

9260.51 Rental Command Posts

Type of equipment:	Mobile Command Center
Quantity:	On demand
Equipment capabilities:	Trailer outfitted with the following: Telephone, radio, copier, facsimile machine, word processing, office supplies filing system, first aid.
Availability restrictions:	None
Location:	Westwego, LA
Response times:	No more than 4 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Jimmy Aime
Daytime telephone number:	
24-hour telephone number:	(800) 436-0883
Mailing address:	ICI PO Box 866 Garyville, LA 70051

Type of equipment:	Mobile Office Building
Quantity:	20-60' trailer.
Equipment capabilities:	
Availability restrictions:	
Location:	Beaumont, TX
Response times:	2 hours
Owner and affiliation:	GE Capital
Point of contact:	Chris Arnold
Daytime telephone number:	409 842-2511
24-hour telephone number:	N/A
Mailing address:	GE Capital. 2905 W. Cardinal Dr. Beaumont, TX 77705

9260.52 Local Portable Command Posts

Texas General Land Office		
La Porte, TX	phone:	(281) 470-6597
Harris County Sheriffs Department		(713) 221-6000
CIMA		(281) 476-5040
City of Baytown	phone:	(281) 422-8281

9260.6 Aircraft Support

9260.61 Aircraft Rental

United States Air Force Auxiliary (CAP)
24 Hour (CAP HQ) phone: (888) 211-1812

FIXED WING

Type of equipment:	Cessna 150
Quantity:	3
Equipment capabilities:	Cessna 150 has 2 person capacity
Availability restrictions:	
Location:	Beaumont
Response times:	
Owner and affiliation:	Commercial
Point of contact:	Don Lewis
Daytime telephone number:	(409) 866-0084
24-hour telephone number:	(409) 755-0756
Mailing address:	Beaumont Wings 455 Keith Road Beaumont, TX 77704

Type of equipment:	Cessna 172
Quantity:	3
Equipment capabilities:	Cessna 172 has 3 person capacity
Availability restrictions:	
Location:	Beaumont
Response times:	
Owner and affiliation:	Commercial
Point of contact:	Don Lewis
Daytime telephone number:	(409) 866-0084
24-hour telephone number:	(409) 755-0756
Mailing address:	Beaumont Wings 455 Keith Road Beaumont, TX 77704

Type of equipment:	Beech 35
Quantity:	1
Equipment capabilities:	Beech 35 has 4 person capacity
Availability restrictions:	
Location:	Beaumont
Response times:	
Owner and affiliation:	Commercial

Point of contact:	Don Lewis
Daytime telephone number:	409) 866-0084
24-hour telephone number:	(409) 755-0756
Mailing address:	Beaumont Wings 455 Keith Road Beaumont, TX 77704
Type of equipment:	Twin Engine Cessna
Quantity:	1
Equipment capabilities:	Has 6 person capacity
Availability restrictions:	
Location:	Beaumont
Response times:	
Owner and affiliation:	Commercial
Point of contact:	Don Lewis
Daytime telephone number:	(409) 866-0084
24-hour telephone number:	(409) 55-0756
Mailing address:	Beaumont Wings 455 Keith Road Beaumont, TX 77704

HELICOPTERS

Type of equipment:	Helicopters
Quantity:	80
Equipment capabilities:	5, 7, 12, and 19 passenger helicopters
Availability restrictions:	7:00 am to 5:00 pm regular hours. Immediate Gulf response, Patterson LA (504) 395-6191 (night crew location)
Location:	Sabine Pass
Response times:	40 minutes
Owner and affiliation:	Commercial
Point of contact:	John Hebert
Type of equipment:	Helicopter
Quantity:	1
Equipment capabilities:	Has 3 person capacity
Availability restrictions:	
Location:	Beaumont
Response times:	
Owner and affiliation:	Commercial
Point of contact:	Don Lewis
Daytime telephone number:	(409) 866-0084
24-hour telephone number:	(409) 755-0756
Mailing address:	Beaumont Wings 455 Keith Road Beaumont, TX 77704

9260.62 Airports

Type of equipment:	Southeast Texas Regional Airport
Quantity:	
Equipment capabilities:	6,751 foot and 5,071 foot runways. FAA offices on site, Air National Guard facility, major highway access. Large areas for open storage, separate areas for commercial and private aviation
Availability restrictions:	

	(b) (7)(F)
Location:	29-57 0' N, 94-01 2' W Elevation 16 feet
Response times:	
Owner and affiliation:	County Government
Point of contact:	Robert Thomas
Daytime telephone number:	(409) 722-0251
24-hour telephone number:	(409) 722-0251
Mailing address:	Robert S. Thomas 2748 Viterbo Road, Box 9 Beaumont, TX 77705
Type of equipment:	Orange County Airport
Quantity:	
Equipment capabilities:	As per James Justice, Justice & Hwang Engineers, the Orange County Airport is designed for 30,000 pound repetitious loads. In emergency conditions, the airfield pavement could withstand a landing load up to 100,000 pounds. Not recommended for heavy loads. The airfield has large open areas and hangars that may be available for staging or storage of equipment. New runway length is 4,400 feet. Airport has Precision Approach Path
Availability restrictions:	(b) (7)(F)
Location:	30-04.2' N, 93-48.2 W
Response times:	
Owner and affiliation:	County Government
Point of contact:	Chuck Frazier, Orange County Courthouse
Daytime telephone number:	(409) 735-3841
24-hour telephone number:	
Mailing address:	Chuck Frazier Orange County Courthouse Orange, TX 77630
Type of equipment:	Beaumont Municipal Airport
Quantity:	
Equipment capabilities:	(b) (7)(F)
Availability restrictions:	
Location:	30-04.2' N, 94-12.9 W; Elevation 32'
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	Kirby Richard
Daytime telephone number:	(409) 880-3742
24-hour telephone number:	
Mailing address:	Kirby Richard P.O. Box 3827 Beaumont, TX 77704
Type of equipment:	Airport, Silsbee/Kountze Hawthorn Field
Quantity:	
Equipment capabilities:	(b) (7)(F)
Availability restrictions:	
Location:	30-20.2', N 94-15.5 W Elevation: 77'
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	Tom Mayfield

Daytime telephone number:	(409) 246-5120
24-hour telephone number:	
Mailing address:	Tom Mayfield c/o Judge P.O. Drawer 760 Kountze, TX 77625
Type of equipment:	Airport, Southland Field, Sulphur, LA
Quantity:	
Equipment capabilities:	5000 foot X 75 foot runway
Availability restrictions:	
Location:	Sulphur, LA
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	Alfred White
Daytime telephone number:	(337) 583-9144
24-hour telephone number:	(337) 583-2488
Mailing address:	Southland Field c/o Cathie Miller 7000 Southland Field, Hwy 108, West Sulphur, LA 70663
Type of equipment:	Airport, Welsh Airport, Welsh, LA
Quantity:	
Equipment capabilities:	2,697' runway and 2,200' runway
Availability restrictions:	
Location:	Welsh, LA
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	Emery Lyon
Daytime telephone number:	(337) 734-2231
24-hour telephone number:	(337) 734-2594
Mailing address:	Welsh Airport 615 N. Kennedy Welsh, LA 70591
Type of equipment:	Airport, Jennings Airport, Jennings, LA
Quantity:	
Equipment capabilities:	3600' runway, 2,000' runway, 5000' runway.
Availability restrictions:	
Location:	Jennings, LA
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	Ed Krielow
Daytime telephone number:	(337) 824-1567
24-hour telephone number:	(337) 824-1567
Mailing address:	Jennings Airport P.O. Box 877, Airport Road Jennings, LA 70546
Type of equipment:	Airport, Lake Charles Regional
Quantity:	
Equipment capabilities:	6500' runway and 4400' runway
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	
Owner and affiliation:	Municipal Government

Point of contact:	Alan Kratzer
Daytime telephone number:	(337) 478-6826
24-hour telephone number:	(337) 433-7121
Mailing address:	Lake Charles Regional Airport P.O. Box 5820 Lake Charles, LA 70606-5820
Type of equipment:	Chennault Jet Center (FPO) Chennault Industrial Airport, Lake Charles, LA
Quantity:	
Equipment capabilities:	3700' runway and 10,710' runway, fueling services and food for aircrew
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	
Owner and affiliation:	Commercial
Point of contact:	Mark Henry
Daytime telephone number:	(337) 436-4877
24-hour telephone number:	(337) 436-4877
Mailing address:	Chennault Jet Center 4500 Chennault Pkwy Lake Charles, LA 70615
Type of equipment:	Airport, Chennault Industrial Airport, Lake Charles, LA
Quantity:	
Equipment capabilities:	3700' runway and 10,710' runway
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	Max E. Jones
Daytime telephone number:	(337) 491-9961
24-hour telephone number:	(337) 491-9961
Mailing address:	Chennault Industrial Airport 3551 Avenue C Lake Charles, LA 70601
Type of equipment:	Airport, Legros Memorial Airport, Crowley, LA
Quantity:	
Equipment capabilities:	4000' runway and 4300' runway
Availability restrictions:	
Location:	Estherwood, LA (8 miles SW of Crowley)
Response times:	
Owner and affiliation:	Municipal Government
Point of contact:	J.D. Haines
Daytime telephone number:	(337) 784-5403
24-hour telephone number:	(337) 784-5403
Mailing address:	Legros Memorial Airport P.O. Box 73 Crowley, LA

9260.7 Lodging

TEXAS

Alamo Plaza Motel	1930 College	Beaumont	(409) 833-1437
Austin Motor Hotel	590 N. 11th St	Beaumont	(409) 835-5371
Best Western	1610 I-10 S.	Beaumont	(409) 842-0037
Hilton, Beaumont	2355 I-10 S.	Beaumont	(409) 842-5646
Holiday Inn, Bmt	3950 I-10 S.	Beaumont	(409) 842-5995
Holiday Inn,	2095 N. 11th St.	Beaumont	(409) 892-2222
LaQuinta Inn	220 I-10 N.	Beaumont	(409) 838-9991
Quality Inn	1295 N. 11th St.	Beaumont	(409) 892-7722
Roadway Inn	I-10 at 11th St.	Beaumont	(409) 892-8111
Midway Motel	198 Texas	Bridge City	(409) 735-2311
Motel 6	5201 E. Parkway	Groves	(409) 962-6611
Southwinds Inn	5101 E. Parkway	Groves	(409) 962-3000
Best Western Airport	Hwy 69 S.	Nederland	(409) 727-1631
Greene Towne Motel	915 Memorial Hwy	Nederland	(409) 722-8397
Villa Motel	1132 Nederland	Nederland	(409) 722-5003
Best Western Orange	2630 I-10 W	Orange	(409) 883-6616
Days Inn	2900 I-10 W.	Orange	(409) 883-9981
Motel 6	4407 N. 27th St.	Orange	(409) 883-4891
Ramada Inn Orange	I-10 W.	Orange	(409) 883-0231
Percy's Motel	3015 Hwy 73 W.	Port Acres	(409) 736-1554
Seashell Motel	2811 Hwy 73 W.	Port Acres	(409) 736-1789
Driftwood Inn	3700 Memorial Hwy	Port Arthur	(409) 985-8411
EconoLodge	2811 Memorial Hwy	Port Arthur	(409) 985-9316
Holiday Inn	2929 Jimmy Johnson	Port Arthur	(888) 400-9714
Pt. Arthur Inn	3889 Gulfway Dr.	Port Arthur	(409) 985-2538
Ramada Inn	3801 Hwy 73 E.	Port Arthur	(409) 962-9858

LOUISIANA

Prioux's Cabins	Holly Beach, LA	Holly Beach	(337) 569-2368
Gulfview Apts	Holly Beach, LA	Holly Beach	(337) 569-2388
Cameron Motel	Cameron, LA	Cameron	(337) 775-5442
Belmont Motor Hotel	2700 Broad St.	Lake Charles	(337) 433-8291
Best Suites	401 Lakeshore	Lake Charles	(337) 439-2444
Downtown Motor Inn	607 N. Lakeshore	Lake Charles	(337) 433-0541
Harrah's Hotel	505 N. Lakeshore	Lake Charles	(337) 437-1500
Best Western	I-10, East	Lake Charles	(337) 433-5213
Chateau Motor Inn	202 Ruth Street	Sulphur	(337) 527-8146
Holiday Inn	200 Ruth Street	Sulphur	(337) 528-2061
LaQuinta Motor Inn	2600 Ruth Street	Sulphur	(337) 527-8303
Best Western, Vinton	I-10 at Vinton	Vinton	(337) 589-7492

9260.8 Food & Water

9260.81 Food

LOUISIANA

Boudin King	906 W. Division	Jennings	(337) 824-6593
Michael A. Catering	417 Jefferson	Lafayette	(337) 237-4634
Steamboat Bill's	1004 Lakeshore Dr.	Lake Charles	(337) 494-1070
Wagon Wheel Catering	3905 Ryan Street	Lake Charles	(337) 474-2607
Jude's Deli	345 Broad St	Lake Charles	(337) 477-3033
Western Sizzlin Steaks	11 W. Prien Lake	Lake Charles	(337) 477-5932
Marilyn's Catering	3450 5th Ave	Lake Charles	(337) 477-3553
Pizza Hut	3000 Maplewood	Maplewood	(337) 625-8241
Pizza Hut	Hwy 378	Moss Bluff	(337) 855-7770
Mr. Gatti's Pizza	1811 Ruth St.	Sulphur	(337) 527-0316
Pizza Hut	2625 Ruth St.	Sulphur	(337) 526-2888
Delta Seafood & Steaks	I-10 exit Vinton	Vinton	(337) 589-2474
Cajun Tales Seafood	501 N. Adams St.	Welsh	(337) 437-4772

TEXAS

Double DD Catering	2520 Ave H	Nederland	(409) 727-2224
Roberts Rst. & Steak Hse.	405 W Cypress Ave.	Orange	(409) 883- 7358
Spanky's Restaurant	1703 N 16th St	Orange	(409) 886- 2949
Moncla's Catering	635 MLK Pkwy	Orange	(409) 840-9051
Tequila's Mexican Rst.	4231 Gulfway Dr.	Port Arthur	(409) 983- 7545
Texas Roadhouse	8575 Memorial Blvd.	Port Arthur	(409) 722- 2246
La Fiesta Mexican&Can.	3801 N Twin City Hwy.	Port Arthur	(409) 962- 3232
Jason's Deli	Central Mall	Port Arthur	(409) 727-6420

9260.82 Water

Kenwood Water	701 Main St.	Beaumont	(800) 235-7873
Mountain Valley	1950 Cedar	Beaumont	(409) 832-2346
Spring Mountain	5105 Cardinal	Beaumont	(409) 842-4727
Triangle	1950 Cedar	Beaumont	(409) 832-2346
K & K Bottled Water	Hwy 90 W	Sulphur	(337) 625-2217
Kentwood Water	4810 E Opelousas	Lake Charles	(800) 444-7873

9260.9 Temporary Storage and Disposal Facilities (TSD)

Class I Hazardous Waste Fuel Recycling:

Dura Therm, Inc.
P. O. Box 58466
Houston, TX 77258-8466 phone: (281) 339-1352
Galveston County fax: (281) 559-1364

Class I Hazardous Waste/Disposal Well - Storage & Processing:

Texas Molecular
Box 1914
2525 Battleground
Deer Park, TX 77536 phone: (281) 930-2525
Harris County fax: (281) 930-2511

Vopak
2000 W. Loop S., Suite 2200
Houston, TX 77027 phone: (713) 623-0000
Harris County fax: (713) 561-7322

Class I Hazardous/Class I Non-Hazardous Municipal Solid Waste/Storage:

Clean Harbors
500 Battleground Road
LaPorte, TX 77571 phone: (281) 476-0645
Harris County fax: (281) 727-7693

Class I Hazardous Waste Mixed Hazardous and Radioactive Waste Storage:

NSSI/Recovery Services, Inc.
P. O. Box 34042
Houston, TX 77234 phone: (713) 641-0391
Harris County fax: (713) 641-6153

Class I Hazardous Waste Storage and Processing:

SCT Environmental In Houston
5738 Cheswood
Houston, TX 77087 phone: (713) 645-8710
Harris County fax: (713) 649-6022

Class I Hazardous Waste/Storage and Processing Incineration:

Rhodia, Inc.
8615 Manchester St.
Houston, TX 77012 phone: (713) 928-3411
Harris County fax: (713) 928-3431

Class I Hazardous Waste/Disposal Well:

Texas Molecular
P. O. Box 7809
6901 Greenwood Dr. (78415)
Corpus Christi, TX 78467 phone: (361) 852-8284
Nueces County fax: (361) 852-3167

Class I Hazardous Waste/Landfill:

Texas Ecologists, Inc.

P. O. Box 307
Robstown, TX 78380 phone: (800) 242-3209
Nueces County fax: (361) 387-0794

RUBBER STORAGE BLADDERS

Type of equipment:	Liquid storage equipment
Quantity:	4 sea slugs
Equipment capabilities:	1260 gallon capacity per bladder
Availability restrictions:	
Location:	Mobile, AL
Response times:	6hrs
Support needed:	
Owner and affiliation:	USCG GST
Point of contact:	OPS
Daytime telephone number:	
24-hour telephone number:	(251) 441- 6601
Mailing address:	ATC Mobile Tanner Williams Rd. MOBILE, AL 36695

TANK BARGES

Type of equipment:	Tank barge
Quantity:	1 420,000 gallon storage capacity tank barge
Equipment capabilities:	
Availability restrictions:	
Location:	Port Arthur, TX
Response times:	
Support needed:	
Owner and affiliation:	MSRC
Point of contact:	
Daytime telephone number:	1-800-645-7745
24-hour telephone number:	1-800-259-6772
Mailing address:	

Type of equipment:	Liquid recovery storage equipment
Quantity:	1 compartment barge/skimmer vessel at 546,000 gallon capacity, 1 compartment barge/skimmer vessel at 84,000 gallon capacity, 2 tank barges at 420,000 gallon capacity each, 1 tank barge at 1,050,000 gallon capacity
Equipment capabilities:	
Availability restrictions:	
Location:	Houston, TX
Response times:	6 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(713) 534-6195
24-hour telephone number:	
Mailing address:	Clean Channel Association, Inc. 3110 Pasadena Freeway PASADENA, TX 77503

PORTABLE STORAGE TANKS

Type of equipment:	Portable storage tanks w/ transport trucks
Quantity:	350 tanks combined
Equipment capabilities:	Tanks can be delivered and placed virtually anywhere. Sizes range from 42 bbl to 500 bbl
Availability restrictions:	None
Location:	Nederland, TX
Response times:	Immediate, 24/7
Support needed:	None
Owner and affiliation:	Commercial
Point of contact:	John Virgilo, Branch Manager
Daytime telephone number:	(409) 729-1131
24-hour telephone number:	(409) 284-0363
Mailing address:	NES Rentals, Inc. 5425 North Twin City Hwy Nederland, TX 77627

Type of equipment:	Portable storage tanks with transport
Quantity:	250+ tanks
Equipment capabilities:	Tanks can be delivered and placed virtually anywhere. Sizes range from 42 bbl to 500 bbl
Availability restrictions:	None
Location:	Lake Charles, LA
Response times:	Immediate, 24/7
Support needed:	None
Owner and affiliation:	Commercial
Point of contact:	
BOA:	Yes
Daytime telephone number:	(337) 882-0678
24-hour telephone number:	
Mailing address:	Baker Tank 3364 Carbide Dr. Lake Charles, LA 70601

Type of equipment:	
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Larry Stenford
Daytime telephone number:	(409) 962-3121
Mailing address:	Rain for Rent 6401 Gulfway Dr. Groves, TX 77619-4207

Type of equipment:	
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Tony Broussard
Daytime telephone number:	(409) 727-0511

Mailing address:	Triangle Waste Solutions 4956 Baurque Rd. Nederland, TX 77627-6357
Type of equipment:	
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Chris Meguire
Daytime telephone number:	(409) 840-2011 or (409) 943-4483
Mailing address:	Tidal Tanks 1497 West Cardinal Dr. Beaumont, TX 77705-6412

ROLL-ON AND ROLL-OFF DISPOSAL BOXES

Type of equipment:	Roll-off boxes
Quantity:	500
Equipment capabilities:	20 and 30 cubic yard, closed top boxes. Boxes will match up to Clean Harbor trucks.
Location:	Port Arthur, TX
Response times:	1 to 2 hours
Owner and affiliation:	Commercial Cleanup Contractor
Point of contact:	Chris Dupuis or dispatcher on call
Daytime telephone number:	(409) 796-1388
24-hour telephone number:	(409) 796-1300
Mailing address:	Clean Harbors P.O. Box 5618 Port Arthur, TX 77640

Type of equipment:	Roll-off boxes
Quantity:	
Equipment capabilities:	
Location:	Nederland, TX
Response times:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 724-2371
24-hour telephone number:	
Mailing address:	BFI 6425 Twin City Hwy Nederland, TX 77705

9260.10 Maintenance and Fueling Facilities

Type of equipment:	Land based fuel transport trucks
Quantity:	3 trucks
Equipment capabilities:	Transport trucks for gasoline, diesel, oil, and antifreeze
Location:	Port Arthur, TX
Owner and affiliation:	Commercial

Point of contact:	Kenneth Spidle
Daytime telephone number:	(409) 727-4400
24-hour telephone number:	(409) 723-6900 (pager)
Mailing address:	Spidle Oil P.O. Box 782 Port Arthur, TX 77641
Type of equipment:	Land based fuel transport trucks
Quantity:	
Equipment capabilities:	Transport trucks for gasoline, diesel, and oils
Location:	Beaumont, TX
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 835-2237
Mailing address:	Tri Con Inc. West Port Arthur Road Beaumont, TX 77701
Type of equipment:	Land based fuel transport trucks
Quantity:	
Equipment capabilities:	Transport trucks for gasoline, diesel, and oils.
Location:	Beaumont, TX
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 833-6331
Mailing address:	Darby Oil 1393 Broadway Beaumont, TX 77701
Type of equipment:	Land based fuel transport trucks
Quantity:	
Equipment capabilities:	Transport trucks for gasoline, diesel and oils
Location:	Orange
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 883-2111
Mailing address:	Craft Oil 1916 Strickland Orange, TX 77630
Type of equipment:	Land based fuel transport trucks
Quantity:	
Equipment capabilities:	Transport trucks for gasoline, diesel, and oils.
Location:	Beaumont, TX
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 842-2323
24-hour telephone number:	
Mailing address:	Sitton Oil & Marine Company 4655 W. Cardinal Drive Beaumont, TX 77701
Type of equipment:	Land/marine based fueling
Quantity:	No skid tanks
Equipment capabilities:	
Location:	DeQuincy and Lake Charles, LA

Point of contact:	Randy Daigle
Daytime telephone number:	1-800-960-3835
24-hour telephone number:	1-800-960-3835
Mailing address:	Daigle Petroleum Sales P.O. Box 7261 Lake Charles, LA 70606
Type of equipment:	Marine fueling facilities
Quantity:	2 barges
Equipment capabilities:	Barge (HMS 65) 6000 bbl diesel, 28,000 bbl potable water; 1200 bbl lube oil; 3000 1.5 hp pump (potable water). Barge (HMS 15) 15,000 bbl diesel; 11,000 gallon potable water, 8" pump diesel
Availability restrictions:	High Island to Orange Cut
Location:	GIWW Intersection with Sabine-Neches Canal
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 983- 6625
24-hour telephone number:	
Mailing address:	Houston Marine Fueling Services 2706 Gulfway Drive Port Arthur, TX 77641
Type of equipment:	Marine fueling station
Quantity:	
Equipment capabilities:	Gasoline, diesel, boat ramp, and boat hoist
Location:	Orange, TX
Point of contact:	Curtis Jackson
Daytime telephone number:	(409) 883-6085
24-hour telephone number:	
Mailing address:	Sabine Yacht Basin 319 Meyers Street Orange, TX 77630 (Adams Bayou)
Type of equipment:	Marine fueling facilities
Quantity:	2 barges
Equipment capabilities:	Barge (HMS 30) 3,000 bbl diesel fuel, 30,000 gallons potable water; 6" pump. Barge (HMS 16) 1500 bbl diesel fuel; 10,000 gallons potable water, 4" pump
Location:	Hackberry, LA
Point of contact:	
Daytime telephone number:	(337) 762-4705
24-hour telephone number:	
Mailing address:	Devall Fleeting Services P.O. Box 128 Hackberry, LA 70645
Type of equipment:	Marine fueling facilities
Quantity:	2 barges
Equipment capabilities:	One Barge with 30,000 gallons of potable water. One Barge with 40,000 gallons of potable water, 3,000 bbl of diesel fuel, 4" diesel pump
Location:	Port Arthur, TX mm 277 GIWW
Point of contact:	
Daytime telephone number:	(409) 962-8424 or VHF-16
24-hour telephone number:	
Mailing address:	Marine Fueling Service, Inc. P.O. Box 3617

	Port Arthur, TX 77643-3617 or MM 277 GIWW
Type of equipment:	Marine fueling facilities Port of Lake Charles
Quantity:	
Availability restrictions:	None
Location:	Lake Charles, LA
Owner and affiliation:	Government
Point of contact:	Ulysses de St. Germain
Daytime telephone number:	(337) 439-3661
Mailing address:	Ulysses de St. Germain P.O. Box AAA Lake Charles, LA 70601
Type of equipment:	Maintenance Facility Port of Lake Charles
Quantity:	
Equipment capabilities:	Engine Service, machinery repair, barge cleaning, and salvage service
Location:	Lake Charles, LA
Response times:	On demand
Owner and affiliation:	Local government
Point of contact:	Ulysses St. Germain
Daytime telephone number:	(337) 439-3661 FAX (337) 493-3523
24-hour telephone number:	(337) 439-3661 FAX (337) 493-3523
Mailing address:	Harbor District P.O. Box AAA Lake Charles, LA 70602
Type of equipment:	Auto Repair facility
Quantity:	
Equipment capabilities:	24-hour vehicle towing, auto repairs, truck repairs
Location:	Lake Charles, LA
Response times:	9 to 5, Monday thru Friday
Owner and affiliation:	Commercial
Point of contact:	Mr. Benthy
Daytime telephone number:	(337) 474-0304
24-hour telephone number:	
Mailing address:	Country Club Auto Repair 4901 Jensen Lane Lake Charles, LA 70602
Type of equipment:	Diesel engine repairs
Quantity:	
Equipment capabilities:	Diesel engine repairs.
Location:	Lake Charles, LA
Response times:	7 to 4, Monday thru Friday
Point of contact:	George LeBeouf, Terry Beard
Daytime telephone number:	(337) 775-5513 (337) 433-9744
24-hour telephone number:	(337) 775-5513
Mailing address:	Lake Charles Diesel Inc. P.O. Box K Cameron, LA 70631

9260.11 Rental Equipment

GENERAL RENTAL

Sunbelt	Port Arthur	(409) 724-7368
Neff Rental	Houston	(888) 709-6333
United Rentals	Beaumont	(409) 833-7902
Hertz Equip. Rental	Beaumont	(409) 727-1390
Prime Equip. Rental	Nederland	(409) 722-0283

Type of equipment:	Portable toilets
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	Immediate
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Mary Martin
Daytime telephone number:	(337) 436-7229
24-hour telephone number:	(337) 436-1435
Mailing address:	Waste Management 536 Wesley Road Lake Charles, LA 70616

Type of equipment:	Portable toilets
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	Immediate
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Ed Belair
Daytime telephone number:	(337) 433-5037
24-hour telephone number:	(337) 527-1574 FAX (337) 439-9523
Mailing address:	Anges's K-Jon 4520 Opelousas Street Lake Charles, LA 70601

Type of equipment:	Portable toilets
Quantity:	Average daily inventory of 200 units
Equipment capabilities:	Will provide chemicals, paper and cleaning twice weekly.
Availability restrictions:	Can draw on Lake Charles, Baytown, and Houston if needed.
Location:	Serving Golden Triangle area
Response times:	Immediate
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Tracy Roccafort
Daytime telephone number:	(409) 842-0065
24-hour telephone number:	(409) 842-0065
Mailing address:	Waste Management 2175 W. Cardinal Drive Beaumont, TX 77705

Type of equipment:	Portable toilets

Quantity:	Average daily inventory of 100 units
Equipment capabilities:	Will provide chemicals, paper and cleaning twice weekly.
Availability restrictions:	
Location:	Port Arthur, TX
Response times:	Immediate
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Steve Pardue
Daytime telephone number:	(409) 724-7823
24-hour telephone number:	
Mailing address:	American Waste Services PO Box 1882 Nederland, TX 77627

Type of equipment:	Office supplies and equipment
Equipment capabilities:	
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(800) 281-3480
24-hour telephone number:	
Mailing address:	Corporate Express 320 7th Street Lake Charles, LA 70601

Type of equipment:	Office supplies and equipment
Equipment capabilities:	
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(337) 439-7996
24-hour telephone number:	
Mailing address:	Office Depot 2806 Ryan St Lake Charles, LA

Type of equipment:	Office supplies and equipment
Equipment capabilities:	
Availability restrictions:	
Location:	Cameron, LA
Response times:	1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(337) 775-5645
24-hour telephone number:	(337) 775-5645
Mailing address:	Clipper Office Supply Cameron, LA 70631

Type of equipment:	Office supplies and equipment (machines, except copiers & computers)
Equipment capabilities:	

Location:	Lake Charles, LA
Response times:	1 hour
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(337) 478-7027
24-hour telephone number:	(337) 478-7027
Mailing address:	Kelly Hamilton Office Machines 155 W. Prien Lake Road Lake Charles, LA 70601
Type of equipment:	Office supplies and equipment
Equipment capabilities:	
Location:	Nederland, TX
Response times:	1 hour
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 722-5599
Mailing address:	Manning's The Plaza 3704 Hwy 365 Nederland, TX 77642
Type of equipment:	Copiers, Computers, Fax machines
Equipment capabilities:	Rental or sales
Location:	Beaumont, TX
Response times:	1 hour
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 892-0671
Mailing address:	Star Graphics 4785 Eastex Freeway Beaumont, TX 77706

COMPRESSORS

Type of equipment:	Portable compressors
Quantity:	35
Equipment capabilities:	Compressors are 100 to 900 cfm, diesel powered with 8-10 hour fuel capacity, most are tow-able
Availability restrictions:	24 hour availability
Location:	Beaumont
Response times:	1-2 hours, depending on availability
Support needed:	Delivery help if several units are needed at once
Owner and affiliation:	Commercial
Daytime telephone number:	(409) 833-6407
24-hour telephone number:	(409) 833-6407
Mailing address:	Heatley Equipment Company 1620 Cardinal Drive Beaumont, TX 77705

GENERATORS

Type of equipment:	Generators
Quantity:	10 generators
Equipment capabilities:	
Availability restrictions:	
Location:	Garyville, LA

Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(985) 535- 1374
24-hour telephone number:	
Fax:	(985) 535- 3262
Mailing address:	ICI 129 Ici Lane Hwy 54 Garyville, LA 70051
Type of equipment:	Generators
Quantity:	3
Equipment capabilities:	2500 and 4500 watts, gasoline powered.
Availability restrictions:	24 hour availability, transportation available, no operators
Location:	Nederland
Response times:	1-2 hours, depending on availability
Support needed:	Delivery help if several units are needed at once
Owner and affiliation:	Commercial
Point of contact:	Rodney Vell, Chad, Wayne Cureton
Daytime telephone number:	(409) 722-5354
24-hour telephone number:	
Mailing address:	Cureton & Sons Rental 106 18th Street Nederland, TX 77627
Type of equipment:	50 kW Generators
Quantity:	2
Equipment capabilities:	50 kW. All equipment is rented full of fuel. Customer is responsible to return full of fuel
Availability restrictions:	24 hour service, 7 days per week, delivery and pickup fee. Equipment on hand
Location:	Nederland
Response times:	2 hours, depending on availability
Support needed:	Trucks for hauling heavy equipment if more than 1 generator at a time is needed. Customer is responsible for operation and security of machine.
Owner and affiliation:	Commercial
Point of contact:	Tommy Jordan and Trey Sharp
Daytime telephone number:	(409) 722-0283
24-hour telephone number:	(409) 722-0283
Mailing address:	Prime Equipment 1635 Industrial Park Drive Nederland, TX 77627

LIGHTING

Type of equipment:	Lighting equipment
Equipment capabilities:	
Location:	Port Arthur, TX
Response times:	1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	

Daytime telephone number:	(409) 983-5646
24-hour telephone number:	(409) 983-5646
Mailing address:	Garner Environmental Services, Inc. 2706 Gulfway Drive Port Arthur, TX 77640
Type of equipment:	Lighting equipment
Equipment capabilities:	
Location:	Garyville, LA
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Jimmy Aime
Daytime telephone number:	(985) 535- 3174
24-hour telephone number:	
Fax:	(985) 535- 3262
Mailing address:	ICI P.O. Box 866 Garyville, LA 70051
Type of equipment:	Lighting equipment
Equipment capabilities:	
Availability restrictions:	
Location:	Pasadena, TX
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(713) 534-6195
24-hour telephone number:	
Mailing address:	Clean Channel Association, Inc. P.O. Box 2489 Houston, TX 77252-2489

PRESSURE WASHERS

Type of equipment:	Pressure washers
Quantity:	6
Equipment capabilities:	2500 psi, 4.5 gallons of water per minute, gasoline powered
Availability restrictions:	24 hour availability, transportation available
Location:	Nederland
Response times:	1-2 hours, depending on availability
Support needed:	Delivery help if several units are needed at once.
Owner and affiliation:	Commercial
Point of contact:	Rodney Vell, Chad, Wayne Cureton
Daytime telephone number:	(409) 722-5354
24-hour telephone number:	
Mailing address:	Cureton & Sons Rental 106 18th Street Nederland, TX 77627
Type of equipment:	Pressure washers
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Beaumont

Response times:	
Support needed:	
Owner and affiliation:	Commercial
Daytime telephone number:	(409) 842-9274
24-hour telephone number:	
Mailing address:	A & A Equipment 780 Chamberlin Dr. Beaumont, TX 77707
Type of equipment:	Pressure washers
Quantity:	5
Equipment capabilities:	2000 to 2500 psi. All equipment is full of fuel, customer responsible to return full
Availability restrictions:	24 hour service, 7 days per week, delivery and pickup fee. Equipment on hand
Location:	Nederland
Response times:	2 hours, depending on availability
Support needed:	Trucks for hauling heavy equipment if more than 1 tower at a time is needed
Owner and affiliation:	Commercial
Point of contact:	Tommy Jordan and Trey Sharp
Daytime telephone number:	(409) 722-0283
24-hour telephone number:	(409) 722-0283
Mailing address:	Prime Equipment 1635 Industrial Park Drive Nederland, TX 77627

PUMPS

Type of equipment:	Pumps
Quantity:	20-2" diesel wash pumps, 6-3" trash pumps, 2-4" trash pumps.
Equipment capabilities:	
Availability restrictions:	
Location:	Garyville, LA
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Jimmy Aime
Daytime telephone number:	(504) 436-0833 FAX (504) 535-3262
24-hour telephone number:	(504) 436-0833
Mailing address:	ICI P.O. Box 866 Garyville, LA 70051
Type of equipment:	Pumps
Quantity:	1 at 2,500 gpm with 8" hose, 1 at 1,200 gpm with 2" hose
Equipment capabilities:	
Availability restrictions:	
Location:	Grand Chenier, LA
Response times:	1 hour
Support needed:	Trailer
Owner and affiliation:	Commercial
Point of contact:	Coral Perry and Neil R. Crain
Daytime telephone number:	(409) 842-1174
24-hour telephone number:	(800) 737-2767

Mailing address:	Crain Brothers, Inc. 2201 West Florida Avenue Beaumont, TX 77705
Type of equipment:	Pumps
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Orange, TX
Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 883-6415
24-hour telephone number:	
Mailing address:	Orange Pump and Valve, Inc. 606 Border Orange, TX 77630

STEAM CLEANERS

Type of equipment:	Steam cleaners
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Garyville, LA
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Jimmy Aime
Daytime telephone number:	(504) 436-0833 FAX (504) 535-3262
24-hour telephone number:	(504) 436-0833
Mailing address:	ICI P.O. Box 866 Garyville, LA 70051

Type of equipment:	Steam cleaners
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Pasadena, TX
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(713) 676-1337
24-hour telephone number:	(713) 676-1337
Mailing address:	Clean Channel Association, Inc. P.O. Box 2489 Houston, TX 77252-2489

Type of equipment:	Steam cleaners
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Beaumont, TX, Sulphur and Grand Chenier, LA

Response times:	
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Coral Perry and Neil R. Crain
Daytime telephone number:	(409) 842-1174
24-hour telephone number:	(800) 737-2767
Mailing address:	Crain Brothers, Inc. 2201 West Florida Avenue Beaumont, TX 77705

9260.12 Industrial Hose Suppliers

The following can supply a complete line of industrial hoses for all aspects of an oil spill response.

South Houston Hose Co. Breco Supply		(713) 643-4355
Houston, TX	fax:	(713) 643-4753
Triplex, Inc.		
Hose Division		(713) 672-9911
P. O. Box 15255	fax:	(713) 672-6510
Houston, TX 77220		

9260.13 Workboat/Offshore Supply/Other Vessels

BOATS, AIR

Type of equipment:	Air boats
Quantity:	3
Equipment capabilities:	Air Boats/Drivers on ready-standby
Availability restrictions:	
Location:	Orange, TX
Response times:	Approx. 1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Donna or Stan
Daytime telephone number:	(409) 920-0716
24-hour telephone number:	(800) 241-6390
Mailing address:	American Airboat Corporation 108 Lutcher Dr. Orange, TX 77643

Type of equipment:	Air boats
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Port Arthur, TX
Response times:	1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 920- 0716
24-hour telephone number:	(281) 991-7105
Mailing address:	Garner Environmental Services, Inc. 5048 Houston Ave. Port Arthur, TX 77640

Type of equipment:	Air boats
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Baytown, TX
Response times:	1-1/2 hours
Support needed:	
Owner and affiliation:	Commercial
24-hour telephone number:	(281) 383-2451
Mailing address:	Marshland Airboats I-10 Baytown, TX

BOATS, WORK

Type of equipment:	Response boats
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Port Arthur, TX
Response times:	1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Elbert Sirmons
Daytime telephone number:	(409) 920-0716
24-hour telephone number:	Cell (713) 254-7985
Mailing address:	Garner Environmental Services, Inc. 5048 Houston Ave. Port Arthur, TX 77640

BOATS, TUG/PUSH/UTILITY

Type of equipment:	Tug Boats
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Lake Charles, LA
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
24-hour telephone number:	(337) 439-3462
Mailing address:	Harbor Docking and Towing 630 Bagdad Rd Westlake, LA 70669

Name:	Moran Towing of Texas, Inc.
Personnel available:	As needed.
Resources available:	Tug boats and push boats.
Daytime telephone number:	(409) 962-0591
Mailing Address:	2300 Hwy 365 Nederland, TX 77627

Name:	Seabulk Towing Services, Inc.
Personnel available:	As needed.
Resources available:	Marine towing.

Daytime telephone number:	(800) 324-3629
Mailing Address:	Seabulk Towing Services, Inc. P.O. Box 915 Lake Charles, LA 70602

OFFSHORE SUPPLY VESSELS

Name:	Neches-Gulf Marine, Inc.
Personnel available:	As needed
Resources available:	5 OSVs and 2 Utility VSLs covering Corpus Christi, TX to New Orleans, LA
Daytime telephone number:	(409) 971-2160
24-hour telephone number:	(409) 971-2169
Address:	Neches-Gulf Marine, Inc. 5500 South Avenue Sabine Pass, TX 77655

Name:	Hornbeck Offshore
Personnel available:	As needed
Resources available:	51 OSVs covering Theodore, AL to Port Aransas, TX
Daytime telephone number:	(504) 384-4710
24-hour telephone number:	(800) 683-8433
Address:	Hornbeck Offshore P.O. Box 2407 Morgan City, LA 70381

Name:	Associated Marine Service, Inc.
Personnel available:	As needed
Resources available:	
Daytime telephone number:	(409) 962-0924
24-hour telephone number:	
Address:	Associated Marine Service, Inc. 5000 Atlantic Rd. Port Arthur, TX 77642

Name:	Seacor
Personnel available:	As needed
Resources available:	51 OSVs covering Theodore, AL to Port Aransas, TX
Daytime telephone number:	(985) 876-5400
24-hour telephone number:	
Address:	Seacor 7910 Main Street Houma, LA 70360

FIRE FIGHTING VESSELS

Name:	Port of Lake Charles
Personnel available:	As needed
Resources available:	One Firefighting Vessel: Response
Daytime telephone number:	(337) 661-3624 (cellular)
24-hour telephone number:	(337) 661-3624 (cellular)
Address:	Port of Lake Charles 150 Marine St. Lake Charles, LA 70601

FISHING FLEETS

Personnel available:	National Marine Fisheries Service
Resources available:	Can provide information on location of fishing fleets in SW-LA/SE-TX
Daytime telephone number:	(409) 727-2271
Address:	2875 Jimmy Johnson Blvd Port Arthur, TX 77630

9260.14 Alternative Technology Response Equipment

IN-SITU BURNING (Note: Refer to USCG Eighth District ISB Plan)

Fire Retardant Boom:

500'	Texas General Land Office	(281) 470-6597
500'	MSRC/Galveston	(409) 740-9188
500'	US Coast Guard (Water-Cooled)	(504) 589-6901
6500'	CISPR/Alaska	(907) 776-5129
17500'	ACS/Alaska	(907) 659-2405

Igniters:

5'	Flare Type - CCA	(713) 534-6195
10'	Flare Type - MSRC	(409) 740-9188
1'	Dist 8 M.S.– U. S. Coast Guard	(504) 589-6901

Air Monitoring:

USCG/GST SMART (713) 671-5113
(251) 441-6601

EPA/START Contractor/EPA Hotline (241) 665-9700

Consultants:

SpilTec, Al Allen (425) 896-0988

DISPERSANT APPLICATION

DISPERSANT AIRCRAFT

Airborne Support, Inc. (ASI) (985) 851-6391

ASI has 2 aircraft dedicated for spill response. One is a DC-4 with a 2,000 gal. capacity; the other a DC-3 with 1,000 gal. capacity. Both have integral spray systems and are located in Houma, LA. They are under contract to M-IRG and Clean Gulf Associates (CGA). Use by non-members of those Co-ops is contingent upon M-IRG and CGA releasing the aircraft to ASI and the non-member signing a contract with ASI. "Wheels Up" for the DC-4 is 4 hours, for the DC-3 is 8 hours. ASI may also be able to access LOOP's dispersant stockpile.

EADC (207) 665-2362
(888) EADC14U

EADC is a consortium of individual Air Tractor owners. Two of the larger AT802 aircraft are in the Houston area and two in Louisiana. They have built-in spray systems and 800 gal. payload. Smaller AT502s are also in the area and have a 500 gal. payload. EADC is currently not under contract for spill response and therefore the aircraft are on "as available" basis.

DISPERSANT SOURCES

Clean Gulf Associates (504) 799-3035
Frank Paskewich (888) 350-2915
Emerg: (888) 242-2007

29,425 gal. of Corexit 9527 in 55 gal. drums in Houston, TX
3,465 gal. of Corexit 9527 in 55 gal. drums in Grand Isle, LA
2,200 gal. of Corexit 9527 in 55 gal. drums in Panama City, FL

LOOP, Inc. (504) 363-9299

8,000 gal. of Corexit 9527 in 2,000 gal. tanks in Houma, LA

20,000 gal. of Corexit 9527 in 2,000 gal. tanks in Galiano, LA
17,300 gal. of Corexit 9527 in 2,000 gal. tanks in Forchon, LA

Clean Caribbean (954) 983-9880
24,200 gal. of Corexit 9527 in 55 gal. drums in Ft. Lauderdale, FL
5,000 gal. of Corexit 9527 in 5,000 gal. tank in Ft. Lauderdale, FL

ONDEO NALCO ENERGY SVCS|
Melinda Fikes (281) 263-7434
Quantity: 200 Drums (9500 Minimum) (800) 366-2526
500 Drums (Maximum) 9527 & 9500
Location: Sugarland, TX

CONSULTANTS

The O'Brien's Group (985)781-0804

BIOREMEDIATION

The following sources can provide complete bioremediation service, including microbial and fertilizer products, application and monitoring equipment and the knowledge to develop a treatment plan:

Oil Mop, Inc., Belle Chase, LA (504) 394-6110

Oppenheimer BioTechnology
P. O. Box 5919 (512) 474-1016
Austin, TX 78763

9260.15 Trucking/Transportation Companies

TEAM WORLDWIDE TRUCKING (800) 338-2925
POC: Scott Gray (281) 435-8786
Houston, TX
(VOSS SHIPPING)

HEAVY EQUIPMENT

Type of equipment:	Heavy Equipment
Quantity:	12 marsh draglines, 2 marsh trackhoes, 1 rubber tire backhoe, 2 trackhoes, 1 D3 bulldozer, 2 boom trailers, 2 absorbent boom trailers
Equipment capabilities:	
Availability restrictions:	
Location:	Grand Chenier and Sulphur, LA
Response times:	1 to 2 hours
Support needed:	Drivers and operators as needed
Owner and affiliation:	Commercial contractor
Point of contact:	Coral Perry and Neil R. Crain
Daytime telephone number:	(409) 842-1174
24-hour telephone number:	(800) 737-2767
Mailing address:	Crain Brothers, Inc. 2201 West Florida Avenue Beaumont, TX 77705

CAR RENTALS/TRUCKING COMPANIES

CAR RENTALS

Avis Rent A Car,	Municipal Airport Lake Charles, LA	(337) 477-9374
Enterprise Car Rental	418 E. College St Lake Charles, LA	(337) 477-3880
Hertz Rent A Car	Regional Airport Lake Charles, LA	(337) 477-0616
Avis Rent-A-Car	SE TX Reg. Airport, Nederland, TX	(409) 722-0209
Hertz Rent-A-Car	SE TX Reg. Airport, Nederland, TX	(409) 727-1390
National Car Rental	SE TX Reg. Airport, Nederland, TX	(409) 722-6111
Thrifty Car Rental	3718 Nederland Ave, Nederland, TX	(409) 722-2277

TRUCKS AND TRAILERS

Type of equipment:	Trucks and trailers
Quantity:	5 Hotshots
Equipment capabilities:	
Availability restrictions:	Unlimited
Location:	Groves and Beaumont, TX
Response times:	1 to 2 hours
Support needed:	Drivers
Owner and affiliation:	Commercial contractor
Point of contact:	Norris Simon, Tommy Reed
Daytime telephone number:	(409) 727-3015 or 962-8591
24-hour telephone number:	(409) 727-3015 or 962-8591
Mailing address:	Acme Truck Lines 3101 Main Avenue Groves, TX 77619

Type of equipment:	Trucks and trailers
Quantity:	12
Equipment capabilities:	18-wheelers with trailers (up to 120,000 lbs.)
Availability restrictions:	Unlimited
Location:	Groves and Beaumont, TX
Response times:	1 to 2 hours
Support needed:	Drivers
Owner and affiliation:	Commercial contractor
Point of contact:	Norris Simon, Tommy Reed
Daytime telephone number:	(409) 727-3015 or 962-8591
24-hour telephone number:	(409) 727-3015 or 962-8591
Mailing address:	Acme Truck Lines 3101 Main Avenue Groves, TX 77619

Type of equipment:	Trucks and trailers
Quantity:	10
Equipment capabilities:	Minoltas (7,000 to 20,000 lbs. capacity)
Availability restrictions:	Unlimited
Location:	Groves and Beaumont, TX
Response times:	1 to 2 hours
Support needed:	Drivers
Owner and affiliation:	Commercial contractor
Point of contact:	Norris Simon, Tommy Reed
Daytime telephone number:	(409) 727-3015 or 962-8591
24-hour telephone number:	(409) 727-3015 or 962-8591

Mailing address:	Acme Truck Lines 3101 Main Avenue Groves, TX 77619
Type of equipment:	Trucks and trailers
Quantity:	10
Equipment capabilities:	1-ton trucks
Availability restrictions:	Unlimited
Location:	Groves and Beaumont, TX
Response times:	1 to 2 hours
Support needed:	Drivers
Owner and affiliation:	Commercial contractor
Point of contact:	Norris Simon, Tommy Reed
Daytime telephone number:	(409) 727-3015 or 962-8591
24-hour telephone number:	(409) 727-3015 or 962-8591
Mailing address:	Acme Truck Lines 3101 Main Avenue Groves, TX 77619

Type of equipment:	Trucks
Quantity:	15
Equipment capabilities:	Hauling capacity is approximately 30-40,000 pounds
Availability restrictions:	None
Location:	Port Arthur, TX
Response times:	1 to 2 hours
Support needed:	Drivers
Owner and affiliation:	Commercial Cleanup Contractor
Point of contact:	Chris Dupuis or dispatcher on call
Daytime telephone number:	(409) 796-1388
24-hour telephone number:	(409) 796-1388
Mailing address:	Laidlaw P.O. Box 5618 Port Arthur, TX 77640

VACUUM TRUCKS

Type of equipment:	Vacuum Trucks
Quantity:	26 (8 super suckers)
Equipment capabilities:	3 inches per minute suction rate, 500 gpm recovery rate, 3000 gallon capacity storage, 200' hose inventory. Diesel fuel required.
Availability restrictions:	Subject to existing assignment obligations
Location:	Port Arthur, TX
Response times:	2 hours
Support needed:	Company supplies trained personnel with equipment
Owner and affiliation:	Commercial
Daytime telephone number:	(409) 796-1388
24-hour telephone number:	(800) 283-1385
Mailing address:	Laidlaw Environmental Services, Inc.

Type of equipment:	Vacuum Trucks
Quantity:	1
Equipment capabilities:	50 bbl capacity vacuum truck, 4" hose, 3 bbls per minute recovery rate, 200' hose inventory, storage capacity of 2,140 gallons
Availability restrictions:	Prior obligations
Location:	Beaumont, TX

Response times:	2 hour maximum
Support needed:	Company supplies trained personnel
Owner and affiliation:	Commercial
Daytime telephone number:	(409) 842-6262 or (800) 777-6062
24-hour telephone number:	(409) 842-6262 or (800) 777-6062
Mailing address:	PWI, Inc. Route 8, Box 65, Highway 124 Beaumont, TX 77705
Type of equipment:	Vacuum Trucks
Quantity:	5 LN 8000 Vacuum trucks; 3 inches per minute suction rate, 130 gpm recovery rate, 500' hose inventory (200' in Orangefield, TX and 300' in Liberty, TX. 2 Super Sucker vacuum trucks; 6 inches per minute suction, 450 gpm recovery rate, 1000' hose inventory. Vehicle uses diesel fuel
Availability restrictions:	Subject to assignment obligations
Location:	Orangefield, TX (2 trucks), Liberty, TX (3 trucks)
Response times:	2 hours
Support needed:	Company supplies trained personnel
Owner and affiliation:	Commercial
Daytime telephone number:	(409) 983-5646
24-hour telephone number:	(409) 722-9135
Mailing address:	Garner Environmental Services 5048 Houston Ave. Port Arthur, TX 77640
Type of equipment:	Vacuum Trucks
Quantity:	5
Equipment capabilities:	GMC-1, Ford-1, Chevrolet-1. GMC, Ford and Chevy suction at 4" per minute, 1129 gpm recovery, 2310 gallon storage capacity, 1200' hose inventory
Availability restrictions:	Subject to company's assignments and/or obligated tasks.
Location:	Port Arthur, TX
Response times:	2 hours
Support needed:	Star has hazmat teams and other trained personnel to respond in major operations
Owner and affiliation:	Commercial
Daytime telephone number:	(409) 982-5711
24-hour telephone number:	(409) 982-5711 or 724-7708
Mailing address:	Motiva Enterprises, LLC P.O. Box 712, N. Houston Ave Port Arthur, TX 77640

TRAILERS

Type of equipment:	Response trailers
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Port Arthur, TX
Response times:	1 hour
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	
Daytime telephone number:	(409) 983-5646
24-hour telephone number:	(409) 983-5646

Mailing address:	Garner Environmental Services, Inc. 5048 Houston Ave. Port Arthur, TX 77640
Type of equipment:	Response trailers
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	Garyville, LA
Response times:	2 hours
Support needed:	
Owner and affiliation:	Commercial
Point of contact:	Jimmy Aime
Daytime telephone number:	(504) 436-0883 FAX (504) 535-3262
24-hour telephone number:	(800) 436-0883
Mailing address:	Industrial Cleanup, Inc. (ICI) P.O. Box 866 Garyville, LA 70051
Type of equipment:	Trailers
Quantity:	
Equipment capabilities:	
Availability restrictions:	
Location:	
Response times:	
Support needed:	
Owner and affiliation:	Commercial contractor
Daytime telephone number:	(409) 833-1528
Mailing address:	Ace Transportation 590 W. Freeway Beaumont, TX 77662

9260.16 Water Intakes

Name:	ENTERGY
Personnel available:	
Resources available:	Knowledge of local area
Daytime telephone number:	(800) 368-3749
24-hour telephone number:	
Address:	P.O. Box 888 Bridge City, TX 77611
Name:	Department of Energy Strategic Petroleum Reserves at Big Hill, TX; Hackberry, LA; and Sulphur, LA.
Resources available:	Knowledge of local area.
Daytime telephone number:	Contact (337) 762-3111, Ext. 295
24-hour telephone number:	
Address:	1450 Black Lake Road Hackberry, LA 70645

9270 List of Scientists

Charlie Henry
NOAA SSC
501 Magazine St
New Orleans, LA 70130
504-589-4414

Dr. Brian Cain
U.S. Fish and Wildlife
17829 El Camino Real, Suite 211
Houston, TX 77058
281-286-8282

Billy Leonard
U.S. Fish and Wildlife
3000 Holly Beach Hwy
Hackberry, LA 70645
337-762-3816

Institute for Environmental Studies
LSU
42 Atkinson Hall
Baton Rouge, LA 70803
225-388-3202

Lamar University Research Center
P.O. Box 10024
Beaumont, TX 77710
409-880-8768

Texas A&M University Spill Research
Texas A&M University
College Station, TX 77843
979-845-3211

9300 Wildlife Emergency Response Plan

DEVELOPMENT STAGES

9310 Wildlife Emergency Response Notification List

In the event of an oil discharge or hazardous substance release determined to pose a threat to wildlife or their ecosystems, the following agencies or personnel must be notified.

9310.1 Southeast Texas Wildlife Response Notification List

Lower Neches State WMA

Agency: (TX) Parks and Wildlife
Contact:24hr Emergency
(281) 842- 8100

U.S. Fish and Wildlife
Contact: Ron Brinkley
(281) 286- 8282
Contact: Tim Cooper
(409) 370 -6822

J.D. Murphee WMA

J.D.Murphee WMA
Contact: Jim Sutherlin
(409) 736- 2551

(TX) Parks and Wildlife
Contact: 24hr Emergency
(281) 842- 8100

U.S. Fish and Wildlife
Contact: Ron Brinkley
(281) 286- 8282
Contact: Tim Cooper
(409) 370 -6822

Mcfaddin NWR

Mcfaddin NWR
Contact:
(409) 971- 2559

U.S. Fish and Wildlife
Contact: Ron Brinkley
(281) 286- 8282
Contact: Tim Cooper
(409) 370 -6822

Sabine Pass Battle Ground Park NP

Sabine Pass Battle Ground Park NP

Contact:
(409)332-8820

(TX) Parks and Wildlife
Contact: 24hr Emergency
(281) 842- 8100

Texas Historical Commission
Contact: Steve Hoyt (Archeology Department)
(512) 463-6096

Texas Point NWR

U.S. Fish and Wildlife
Contact: Ron Brinkley
(281) 286- 8282
Contact: Tim Cooper
(409) 370 -6822

Sea Rim State Park

Sea Rim State Park
Contact:
(409) 971- 2559

(TX) Parks and Wildlife
Contact: 24hr Emergency
(281) 842- 8100

9310.1 Southwest Louisiana Wildlife Response Notification List

Cameron Prairie National Wildlife Refuge

(LA) Wildlife and Fisheries (Fisheries)
Contact: Amanda Shahan
(337) 491- 2571
Contact: Vaughan McDonald
(225) 765-0765

U.S. Fish and Wildlife Service
Contact: Buddy Goatcher
(337) 291- 3125
(337) 280- 1157

LOSCO
Contact: Karolien Debusschere
(225) 219- 5800
24-hour contact pager number
800-538-5388 pin 128-401

APHIS (USDA)
Contact: Dwight Leblanc
(225) 389- 0229
(866) 487- 3297

24 hour – Louisiana Emergency Hazardous Materials
(877) 925- 6595

Lacassine National Wildlife Refuge

(LA) Wildlife and Fisheries (Fisheries)
Contact: Amanda Shahan
(337) 491- 2571
Contact: Vaughan McDonald
(225) 765-0765

U.S. Fish and Wildlife Service
Contact: Buddy Goatcher
(337) 291- 3125
(337) 280- 1157

LOSCO
Contact: Karolien Debusschere
(225) 219- 5800
24-hour contact pager number
800-538-5388 pin 128-401

APHIS (USDA)
Contact: Dwight Leblanc
(225) 389- 0229
(866) 487- 3297

24 hour – Louisiana Emergency Hazardous Materials
(877) 925- 6595

Rockefeller Bayou

(LA) Wildlife and Fisheries
Contact: W. Guthrie Perry
(337) 538- 2276
(337) 491- 2000
(337)515- 8646

(LA) Wildlife and Fisheries (Fisheries)
Contact: Amanda Shahan
(337) 491- 2571
Contact: Vaughan McDonald
(225) 765-0765

U.S. Fish and Wildlife Service
Contact: Buddy Goatcher
(337) 291- 3125
(337) 280- 1157

LOSCO
Contact: Karolien Debusschere
(225) 219- 5800
24-hour contact pager number
800-538-5388 pin 128-401

APHIS (USDA)
Contact: Dwight Leblanc
(225) 389- 0229
(866) 487- 3297

24 hour – Louisiana Emergency Hazardous Materials
(877) 925- 6595

Sabine NWR

Sabine NWR
Contact:
(337) 762- 3816

(LA) Wildlife and Fisheries (Fisheries)
Contact: Amanda Shahan
(337) 491- 2571
Contact: Vaughan McDonald
(225) 765-0765

U.S. Fish and Wildlife Service
Contact: Buddy Goatcher
(337) 291- 3125
(337) 280- 1157

LOSCO
Contact: Karolien Debusschere
(225) 219- 5800
24-hour contact pager number
800-538-5388 pin 128-401

APHIS (USDA)
Contact: Dwight Leblanc
(225) 389- 0229
(866) 487- 3297

24 hour – Louisiana Emergency Hazardous Materials
(877) 925- 6595

9400 Area Planning Documentation

TO BE DEVELOPED

9410 Discharge and Release History

TO BE DEVELOPED

9420 Risk Assessment

TO BE DEVELOPED

9430 Planning Assumptions – Background Information

Subcommittees review applicable sections and are evaluated by Chairman and Steering Committee for final approval. Area Contingency Plans shall be reviewed and updated annually by the Area Committee. Plans shall be reviewed to ensure all information is current, and in particular, the following areas shall be looked at: emergency notification list, response equipment information (type and amount of equipment available), sensitive areas, hazard/risk assessment of the area, response strategies (changes based on new technology, new equipment, etc.), and dispersant approval. Any changes to the plan must be noted on the record of changes page.

The FOSC shall periodically conduct drills of removal capability, without prior notice, in areas for which Area Contingency Plans are required, to assess the effectiveness of such plans and relevant tank vessel and facility plans. These drill may include participation by Federal, State, local agencies, owners and operators of vessels and facilities in the area, and private industry. The NSFCC will act as a clearinghouse for these exercises, participating in the development, execution, and evaluation to the fullest extent practicable, with the cognizant program managers of the USCG and EPA. The NSFCC may, in conjunction with the cognizant program managers of the USCG and EPA, impose unannounced area or multi-area exercises.

[NOTE: The NSFCC is responsible for executing the National Response System Pollution Exercise Program (NRSPEP). All Coast Guard participation in exercises will be coordinated with and/or through the NSFCC.]

All responses will be in the MSU Port Arthur COTP AOR unless conducted jointly with other AORs (as in SON's exercises). All other assumptions will be as directed by the drill committee.

9440 Planning Scenarios

TO BE DEVELOPED

Appendix C
OSRO Services agreement and Equipment Lists

Garner Environmental Services is under contract as the primary provider of oil spill services. Garner is a USCG Certified OSRO and is available 24/7 to respond to a worse case discharge to the maximum extent practicable.

The OSRO and Huntsman's oil spill and hazmat response management team are all adequately trained and will be relied upon for equipment and staffing for at least the first seven days of any response.

Garner Environmental is under contract to provide response equipment and personnel in the event of an unauthorized discharge (refer to **Section 2.12**).

A complete list of equipment available to the OSRO is contained in this Appendix. The OSRO has extensive subcontracts with other OSRO's nationwide and can scale up its resources quickly.

The maximum size ship that can be accommodated at our pier is 700ft. the OSRO indicated he will supply at least 1400ft of containment boom and the means of deploying and anchoring the boom in within 45 minutes of detection of the spill. Also, Garner can, within two hours of detecting a spill supply recovery devices and storage capacity to store more than 30,000 gallons of oil and oily products. This greatly exceeds our maximum most probable discharge amount of 352.5 BBLS (14,805 gals).

Alphabetical OSRO Classifications by Company

Facilities *Vessels*

0027 Garner Environmental Services

COTP: CORPUS CHRISTI

☑ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☐	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☐	☐	☑	☑
Offshore	☐	☐	☑	☑	☐	☐	☑	☑
Nearshore	☐	☐	☑	☑	☐	☐	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

COTP: HOUSTON-GALVESTON

☑ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☑	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☐	☐	☑	☑
Offshore	☐	☐	☑	☑	☐	☐	☑	☑
Nearshore	☐	☐	☑	☑	☐	☐	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

COTP: MOBILE

☐ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☑	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☑	☑	☑	☑
Offshore	☐	☐	☑	☑	☑	☑	☑	☑
Nearshore	☐	☐	☑	☑	☑	☑	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

COTP: MOBILE(PANAMA CITY, FL)

☐ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☑	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☑	☑	☑	☑
Offshore	☐	☐	☑	☑	☑	☑	☑	☑
Nearshore	☐	☐	☑	☑	☑	☑	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

COTP: MORGAN CITY

☐ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☑	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☑	☑	☑	☑
Offshore	☐	☐	☑	☑	☑	☑	☑	☑
Nearshore	☐	☐	☑	☑	☑	☑	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

COTP: NEW ORLEANS

☑ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☑	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☐	☐	☑	☑
Offshore	☐	☐	☑	☑	☐	☐	☑	☑
Nearshore	☐	☐	☑	☑	☐	☐	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

COTP: PORT ARTHUR

☑ ***High Volume Port***

	Facilities				*Vessels*			
	MM	*W1*	*W2*	*W3*	*MM*	*W1*	*W2*	*W3*
River/Canal	☑	☑	☑	☑	☑	☑	☑	☑
Inland	☑	☑	☑	☑	☑	☑	☑	☑
Open Ocean	☐	☐	☑	☑	☐	☐	☑	☑
Offshore	☐	☐	☑	☑	☐	☐	☑	☑
Nearshore	☐	☐	☑	☑	☐	☐	☑	☑
Great Lakes	☐	☐	☐	☐	☐	☐	☐	☐

CERTIFIED DISCHARGE CLEANUP ORGANIZATION LIST (DCO)

Entity Name	City	Phone Number	Fax Number	Remarks
American Pollution Control, Inc.	New Iberia	318-988-7460	318-365-8890	
AMX Environmental Evolution LTD	Houston	713-378-9911	713-378-9922	
Anderson Pollution Control, Inc.	Conroe	936-441-2225	936-539-2099	
CCC Group, Inc.	San Antonio	210-661-4251	210-661-6060	Service to Alcoa in Pt.Comfort
Chemical Response & Remediation	Harlingen	956-365-4252	956-365-4412	
Clean Channel Association	Pasadena	713-534-6195	713-5346197	
Clean Harbors Environmental Svcs, Inc.	Kingston	800-914-4244	781-585-9797	Office in Port Arthur
Corpus Christi Area Oil Spill Control	Corpus Christi	361-882-2656	361-882-7745	
Eagle Construction	LaPorte	281-867-9131	281-867-9150	
Environmental Safety& Health CSI	Houma	985-851-5350	985-853-1978	
Garner Environmental Services	Deer Park	281-930-1200	281-478-0296	Freeport,Pt Arthur, LaMarque,
HMHTTC Response Team, Inc.	Houston	281-448-8806 (ext 680)		
Hyde Environmental Services	Bridge City	409-735-3600	409-735-3603	
Kiva Construction & Engineering Inc.	Anahuac	409-252-3211	409-252-4140	
Marine Salvages & Services, Inc.	Port Isabel	956-943-2648	956-943-4516	
Marine Spill Response Corp.	Lake Charles	337-475-6400	337-475-6401	Offices also in Galveston, Ingleside
Midstream Fuel Services, LLC	Port O'Connor	361-983-2631	361-983-4239	
Miller Environmental Services, Inc.	Corpus Christi	361-289-9800	361-289-6363	Office also in Sulphur, LA
Milstead Environmental, LLC	Spring	800-838-9707	281-367-4060	Offices in Spring, Vidor, Huntsville
National Response Corporation	Great River	631-224-9141	631-224-9082	Offices in Houston, Galveston, Ingleside
O' Brien's Response Management, Inc.	Slidell	985-781-0804	985-781-0580	
Oil Mop, Inc.	Belle Chase	504-394-6110	504-394-9677	Offices in Deer Park & Port Arthur
Palacios Marine & Industrial Coatings	Palacios	979-541-7286		
Phoenix Pollution Control & Env. Svc.	Baytown	281-838-3400	281-424-7748	
R&D Environmental Services	Channelview	281-860-0035	281-860-0045	
R.M. Walsdorf, Inc.	Brownsville	956-831-3984	956-831-4923	
SSCI Env.& Consulting Svcs.	Houston	281-486-1943	281-486-7415	
T & L Lease Service	Alvin	281-331-8221	281-585-5383	
T & T Marine Salvage, Inc.	Galveston	409 744-1222	409-744-5218	
Texas Environmental Resources, Inc.	Beaumont	409-833-3596	409-833-1715	
Triangle Waste Solutions	Port Arthur	409-736-3600	409-736-2572	
United States Environmental	Meraux	504-279-9930	504-279-7756	Office also in LaPorte

Listings are subject to change. Contact Bobby Rivera, Texas General Land Office (512) 463-5093 if you have any questions. (rev. 07/28/09)

GARNER

GARNER ENVIRONMENTAL SERVICES, INC., HOUSTON, TEXAS
1717 W. 13TH STREET, DEER PARK, TX 77536 • 281-930-1200 • 800-424-1716
ISO 9001-2000 CERTIFIED

March 24, 2005

Huntsman Petrochemical Corporation
Attn: Mr. Phil Schreiber
Emergency Response Team Leader
PO Box 847
Port Neches, TX 77651

Re: Letter of Intent to Respond

Mr. Schreiber:

Thank you for your recent inquiry concerning Garner Environmental Services, Inc. emergency response capabilities. Per your request, Garner Environmental Services is pleased to offer HUNTSMAN PETROLEUM CORP. our response services to respond in the event of an accidental release on an as needed, first come first served basis, from our PORT ARTHUR, TEXAS facility, as a first responder for the facility(ies) listed in Attachment 1. Per 33 CFR §154.1045(c)(1) and (c)(2) and 33 CFR §155, Appendix B, Para. 2.2.6, all time and equipment requirements will be met for AMPD coverage. Response time to this facility is based on a 35 mph rate of travel over land routes and 5 kph over water routes. Refer to Attachment 1 for Response Tier and Time Levels.

Should a response effort be required, please contact the 24-hour Emergency Response Telephone number listed on Attachment 1.

Attached are Garner Environmental Services, Inc.'s U.S. Coast Guard OSRO classification letter and the Texas General Land Office DCO certificate for incorporation in your facility plan.

Sincerely,

Otis L. Chambers
Executive Vice President

OC/fl

Enclosure

cc: Ms. Valerie Powe – CRA Consulting – Baton Route, LA

GARNER
ENVIRONMENTAL
SERVICES, INC.

1717 West 13th Street, Deer Park, Texas 77536 · Phone: (281) 930-1200 · FAX: (281) 478-0296
ISO 9001 - 2000 Certified

Attachment 1

Tier Response Level and Response Time

Garner Response Facility Contact / Telephone Nr. Geographic Area	**Mileage**	**Tier Level**	**Response Time**
Port Arthur, Texas Elbert Sirmons / (409) 983-5646 or (800) 983-7634			
Response Location: *2701 Spur 136* *Port Neches, TX 77651*	6	1	45 mins.

GARNER ENVIRONMENTAL SERVICES, INC.
1717 West 13th Street
Deer Park, Texas 77536
Telephone: (281) 930-1200
Fax: (281) 478-0296

RESPONSE EQUIPMENT LISTING

Corporate	Response Equipment Listing	Equipment Listing
Operations		Rev. January 2009

BOOM TYPE CODE	
F	Fence
FR	Fire
PI	Inflatable (Press)
SI	Inflatable (Self)
MR	Marsh (Upper air chamber with lower water chamber)
R	Round
SB	Weir Boom
OT	Other

END CONNECTOR CODE	
ASTM	ASTM Std (D962-86)
BOLT	Bolt Connector
HP	Hinge & Pin
Z	Quick-Connect Z
RC	Raised Channel
SNAV	Slide (US Navy)
SLOT	Slotted Tube
US1	Universal Slide Type 1
US2	Universal Slide Type 2
OT	Other

BOOM EQUIPMENT

Name of Manufacturer	Model Number	Boom Type Code	Invent Length (feet)	Skirt Size (in.)	Float Size (in.)	End Connector Type Code	Time to Deploy	Storage Location	Owner
Acme Products Co.	OK CORRAL	R	22,000	12	6	Z	6.0	Deer Park	Garner
Acme Products Co.	SUPER-MINI	R	800	4	2.5	BOLT	2.0	Deer Park	Garner
Acme Products Co.	OK CORRAL	R	10,000	12	6	Z	6.0	La Marque	Garner
Acme Products Co.	OK CORRAL	R	800	28	8	Z	1.0	La Marque	Garner
Acme Products Co.	OK CORRAL	R	5,000	12	6	Z	2.5	Port Arthur	Garner
Acme Products Co.	SUPER-MINI	R	100	4	2.5	BOLT	0.5	Port Arthur	Garner
Acme Products Co.	OK CORRAL	R	4000	34	8	Z	2.0	Port Arthur	Garner`
Acme Products Co.	OK CORRAL	R	2000	34	8	Z	2.0	Port Arthur	Garner
Acme Products Co.	OK CORRAL	R	10,000	12	6	Z	6.0	Deer Park/ Port Arthur	Garner
Acme Products Co.	MINI-BOOM	R	700	4	2.5	BOLT	1.0	Port Arthur	Garner

COMMUNICATIONS TYPE CODES			
AF	Aviation Frequency	**MF**	Marine Frequency
CP	Cellular Phone	**PAG**	Pager
COM	Command Post	**PHH**	Portable Hand Held
MOD	Computer w/modem	**SSB**	Single Side Band
FAX	Facsimile	**TP**	Telephone
FBS	Fixed Base Station	**OT**	Other

COMMUNICATIONS EQUIPMENT

Name of Manufacturer	Model Number	Comm Type	Nr. of Units	Frequency	Band	Range (miles)	Field Tunable		Storage Location	Owner
							Yes	No		
Motorola	A05J	PAG	20	931.462	FM	150		x	Deer Park	Garner
Motorola	F09LF	CP	40	152.840	FM	200		X	Deer Park	Garner
40' Garner Command Post		COM	1					X	Deer Park	Garner
26' Communications Trailer	MCC1	COM	1	931.462			X		La Marque	Garner
Motorola	A05J	PAG	20	931.462	FM	150		X	La Marque	Garner
Motorola	F09LF	PHH	20					X	La Marque	Garner
Motorola	A05J	PAG	12	931.462	FM	150		X	Port Arthur	Garner
Motorola	F09LF	CP	12	152.840	FM	200		X	Port Arthur	Garner

RESPONSE VEHICLES						
Name of Manufacturer	**Response Vehicle**	**Number of Units**	**Wide Load Permit Needed**		**Storage Location**	**Owner**
			Yes	**No**		
Wabash	48’ Box Vans, Hard Boom Trailers	2		X	Deer Park	Garner
Fruehauf	48’ Box Van, Sorbent Boom Trailer	1		X	Deer Park	Garner
Ford/Chevy	Pick-up Truck, 1 ton	20		X	Deer Park	Garner
Sooner	Emergency Response Trailer, 32'	3		X	Deer Park	Garner
Modern Mfg.	Boom Trailer, 20' Gooseneck	4		X	Deer Park	Garner
Containment Sys. & Gooseneck	Emergency Haz-Mat Response Trailers 32’ & 24’	2		X	Deer Park	Garner
Falcon	Trailer, 20', Stand-by/Rescue	3		X	Deer Park	Garner
Pace	28’ Rescue Standby & Command Post	2		X	Deer Park	Garner
Ford/Chevy	Pick-up Truck, 1 ton	13		X	La Marque	Garner
Garner	Roll-Off Box, 20 yd;	2		X	La Marque	Garner
Sooner	Emergency Response Trailer, 32'	1		X	La Marque	Garner
Modern Mfg.	Boom Trailer, 20' Gooseneck	3		X	La Marque	Garner
Iron Horse	Boom Trailer, 20 Gooseneck	2		X	La Marque	Garner
Modern Mfg.	Spill Trailer, 16' Lo-Boy	4		X	La Marque	Garner
Modern Mfg.	Spill Trailer, 20’	2		X	La Marque	Garner
Ford	Pick-up Truck, 1 ton	7		X	Port Arthur	Garner
Sooner	Emergency Response Trailer, 32"	1		X	Port Arthur	Garner
Modern Mfg.	Trailer, Spill Response, 16' Lo-Boy	1		X	Port Arthur	Garner
Modern Mfg.	Boom Trailer, Gooseneck, 20’	3		X	Port Arthur	Garner
Gemini Cargo	Trailer, Haz-Mat, 19'	1		X	Port Arthur	Garner
Ford/Chevy	Pick-up Truck, 1 ton (2 Deer Park & 4 Port Arthur)	6		X	Deer Park / Port Arthur	Garner
Modern Mfg.	Spill Trailer, 20' Lo-Boy	2		X	Port Arthur	Garner
Pace American	36’ Haz Mat Response Trailer	1		X	Deer Park	Garner
Modern Mfg.	21’ Oil Spill Response Trailer (Boat/ Boom/ Sorbent)	1		X	Port Arthur	Garner
Gooseneck	20’ Response Trailer (Industrial Response)	1		X	Deer Park	Garner
Modern Mfg.	Boom Trailer, Gooseneck, 20’	2		X	Port Arthur	Garner
	8’ Utility Trailers	1		X	Port Arthur	Garner
Sooner	Spill Trailer 32 ‘ Response	1		X	Port Arthur	Garner

BOOM EQUIPMENT

Name of Manufacturer	Model Number	Equipment Type	Quantity	Storage Location	Owner
Norfloat	A2	Buoy, Anchor Marker, Inflatable, 18” dia.	25	Deer Park	Garner
Polycord	600x1/4	Rope, Polypropylene, 1/4" x 600'	5	Deer Park	Garner
Polycord	600x1/2	Rope, Polypropylene, 1/2" x 600'	5	Deer Park	Garner
U.S. Anchor Mfg., Inc.	22#	Anchor, Galvanized Steel, 22 lb., Danforth Style	11	Deer Park	Garner
U.S. Anchor Mfg., Inc.	40#	Anchor, Galvanized Steel, 40 lb., Danforth Style	6	Deer Park	Garner
U.S. Anchor Mfg., Inc.	75#	Anchor, Galvanized Steel, 75 lb., Danforth Style	8	Deer Park	Garner
U.S Anchor Mfg. Inc.	100#	Anchor, Galvanized Steel, 100 Lb. Danforth Style	13	Deer Park	Garner
Norfloat	A2	Buoy, Anchor Marker, Inflatable, 18” dia.	25	La Marque	Garner
Polycord	600 x1/4	Rope Polypropylene, 1/4” x 600’	5	La Marque	Garner
Polycord	600 x ½	Rope Polypropylene, 1/2 “ x 600’	5	La Marque	Garner
U.S. Anchor Mfg., Inc.	22#	Anchor, Galvanized Steel, 22 lb., Danforth Style	8	La Marque	Garner
U.S. Anchor Mfg., Inc.	40#	Anchor, Galvanized Steel, 40 lb., Danforth Style	5	La Marque	Garner
Norfloat	A2	Buoy, Anchor Marker, Inflatable, 18” dia.	15	Port Arthur	Garner
Polycord	600 x 1/4	Rope Polypropylene 1/4 “ x 600 ‘	5	Port Arthur	Garner
Polycord	600 x 1/2	Rope Polypropylene 1/2 “ x 600’	5	Port Arthur	Garner
U.S. Anchor Mfg., Inc.	22 #	Anchor, Galvanized Steel, 22 lb., Danforth Style	12	Port Arthur	Garner
U.S. Anchor Mfg., Inc.	75#	Anchor, Galvanized Steel, 75 lb., Danforth Style	6	Port Arthur	Garner
U.S. Anchor Mfg., Inc.	100#	Anchor, Galvanized Steel, 75 lb., Danforth Style	4	Port Arthur	Garner
Norfloat	A2	Buoy, Anchor Marker, Inflatable, 18” dia.	20	Deer Park	Garner
Polycord	600 x1/4	Rope Polypropylene, 1/4” x 600’	5	Deer Park	Garner
Polycord	600 x ½	Rope Polypropylene, 1/2 “ x 600’	5	Deer Park	Ganrer
U.S. Anchor Mfg., Inc.	22 #	Anchor, Galvanized Steel, 18 lb., Danforth Style	20	Deer Park	Garner
U.S. Anchor Mfg., Inc.	40 #	Anchor, Galvanized Steel, 22 lb., Danforth Style	8	Deer Park	Garner
U.S. Anchor Mfg. Inc.	100 #	Anchor, Galvanized Steel, 100 #, Danforth Style	10	Deer Park	Ganrer

AIR MONITORING EQUIPMENT				
Name of Manufacturer	**Miscellaneous Equipment**	**Number of Units**	**Storage Location**	**Owner**
Rae Systems	Q-RAE	4	Deer Park	Garner
Rae Systems	Mini RAE 2000	2	Deer Park	Garner
Rae Systems	Ultra Rae	1	Deer Park	Garner
MSA	5 Star	3	Deer Park	Garner
MSA	Watchman	1	Deer Park	Garner
Airzona Instruments	Jerome X431	2	Deer Park	Garner
Elmer Perkins	Micro FID	1	Deer Park	Garner
Draeger	CMS	2	Deer Park	Garner
Ludlum	Model # 3	2	Deer Park	Garner
MSA	4-Gas Meter	3	La Marque	Garner
Draeger	Accuro Pump	1	La Marque	Garner
Rae	Photo-Ionisation Detector	1	La Marque	Garner
	Mercury Vapor Analyzer	1	Deer Park	Garner
	Radiation Monitor	1	Deer Park	Garner
	Solar Radiation Monitor	1	Deer Park	Garner
	Weather Station	2	Deer Park	Garner
	Infrared Thermometer	1	Deer Park	Garner
	GPS Units	2	Deer Park	Garner
Aim	4-Gas Monitor	2	Deer Park	Garner
Draeger	Accuro Pump	2	Deer Park	Garner
Draeger	CMS Meter	1	Deer Park	Garner
Rae	Mini-Rae 2000 Portable VOC Meter	2	Deer Park	Garner
Quest	Single Gas Personal Meter	1	Deer Park	Garner
MSA	Escort Particulate Air Monitor	1	Deer Park	Garner
Sper Scientific	PH Meter	1	Deer Park	Garner
Dexsil	PetroFlag Hydrocarbon Test Kit	1	Deer Park	Garner
Chlorine	AC/ Kit	1	Deer Park	Garner

	Specialty Equipment			
Name of Manufacturer		**Number of Units**	**Storage Location**	**Owner**
Scott	Self Contained Breathing Apparatus(SCBA) with 12 extra bottles / Scott	12	Deer Park	Garner
Dreager	Self Contained Breathing Apparatus (SCBA) with12 extra bottles / Dreager	12	Deer Park	Garner
	Bezt Valve / Off Loading Valve	2	Deer Park	Garner
	Chorine Emergency Kit A	1	Deer Park	Garner
	Chorine Emergency Kit B	1	Deer Park	Garner
	Chorine Emergency Kit C	1	Deer Park	Garner
	Vacuum Cleaner / Stainless Steel, Mercury, HEPA	2	Deer Park	Garner
	Cameras / Digital	10	Deer Park	Garner
	Confine Space Rescue Kits	3	Deer Park	Garner
	Coppus Blowers	2	Deer Park	Garner
	Air Compressors 11.8 cfm 90 psi	8	Deer Park	Garner
	Drum Crushers / Diesel Power	2	Deer Park	Garner
	Drum Crabber	5	Deer Park	Garner
	Generators	4	Deer Park	Garner
	Scare Guns	3	Deer Park	Garner
	Decontamination Pools 20” x 100’	2	Deer Park	Garner
	Fan, Ventilation 48’	3	Deer Park	Garner
	Artic Cat, Four Wheeler	1	Deer Park	Garner
	Light Stands	5	Deer Park	Garner
	Self Contained Breathing Apparatus (SCBA) with Extra bottles	9	La Marque	Garner
	Air Compressors (Portable)	8	La Marque	Garner
	HEPA Vacuums	3	La Marque	Garner
	Cameras / Digital	3	La Marque	Garner
	Artic Cat, Four Wheeler	2	La Marque	Garner
	Generators	4	La Marque	Garner
	Self Contain Breathing Apparatus (SCBA)	10	Port Arthur	Garner
	Cameras / Digital	1	Port Arthur	Garner

	Specialty Equipment / Continued			
	Coppus Blowers	1	Port Arthur	Garner
	Air Compressors	3	Port Arthur	Garner
	Generators	1	Port Arthur	Garner
	Scare Guns	4	Port Arthur	Garner
	Pressure Washers	1	Port Arthur	Garner
	Explosion Proof Lights	1	Port Arthur	Garner
	Weed Eaters	1	Port Arthur	Garner
	Chlorine Emergency Kit “C”	1	Deer Park	Garner
	Midland Kit	1	Deer Park	Garner
	Railcar Haz Hammock	1	Deer Park	Garner
	Mercury Vacuum	1	Deer Park	Garner
	Carbon Filter Systems	1	Deer Park	Garner
	Sand Filter Systems	2	Deer Park	Garner
	Wet & Dry Vacuum with HEPA Filter	1	Deer Park	Garner
	100 Watt Explosion Proof Light Sets	2	Deer Park	Garner
	Decon Pools 4’ x4’ x14’ 5”	2	Deer Park	Garner
	Spill Guard 6’ x 4’ x8”	1	Deer Park	Garner
	Drum Dolly	3	Deer Park	Garner
	3/4 “ Core Sampler	1	Deer Park	Garner
	Soil Sampler (boring) Kit	1	Deer Park	Garner
	Self Contained Breathing Apparatus (SCBA)	9	Deer Park	Garner
	Generators (Portable)	3	Deer Park	Garner
	Weed Eaters	5	Deer Park	Garner
	Air Compressors (Portable)	2	Deer Park	Garner
	Light Stand (Portable)	2	Deer Park	Garner
	Coppus Blower	1	Deer Park	Garner
	Chain Saw	1	Deer Park	Garner
	Tank Truck Emergency Transfer Valve	1	Deer Park	Garner
	Artic Cat , Four Wheeler	1	Port Arthur	Garner
	16’ Trailer Mounted Steam Cleaner with Tank	1	Port Arthur	Garner
	Air Horn, 6”	1	Deer Park	Garner
	Fan Ventilation, 48”	1	Deer Park	Garner
	Fan Ventilation, 16” Port A Cool with water Mister	1	Deer Park	Garner

	Digital Cameras	4	Deer Park	Garner	

A	Auger/Screw	**D**	Diesel
C	Fire	**E**	Electric
P	Parastolic	**G**	Gasoline
R	Reciprocating	**H**	Hydraulic
I	Rotary/Flexible impeller	**P**	Pneumatic
OT	Other	**OT**	Other

PUMP EQUIPMENT

Name of Manufacturer	Model Number	Pump Type Code	Drive Type Code	Suction/ Discharge Size (inches)	Mfg. Pump Rate (gpm)	Quantity	Storage Location	Owner
Aro/Ingersoll Rand	KO176-44	P	P	1.0	120	2	Deer Park	Garner
Honda	WXT-20	G	I	2.0	180	4	Deer Park	Garner
Yanmar	LD-40/2	D	I	2.0	180	2	Deer Park	Garner
Honda	WXT-30	G	I	3.0	275	1	Deer Park	Garner
Wilden	Model M	P	P	3.0	240	5	Deer Park	Garner
Honda	WXT-20	G	I	2.0	180	3	La Marque	Garner
Yanmar	LD-40/2	D	I	2.0	180	5	La Marque	Garner
Wilden	Model M	OT	P	3.0	240	7	La Marque	Garner
Acme Products Co., Inc.	FS-150A	G	I	1.5	275	1	Port Arthur	Garner
Honda	WXT-20	G	I	2.0	180	6	Port Arthur	Garner
Yanmar	LD-40/3	D	I	2.0	200	2	Port Arthur	Garner
Versa-Matic		OT	P	2.0	140	1	Deer Park	Garner
Versa-Matic		OT	P	1.5	140	1	Deer Park	Garner
Honda	EPT2	G	I	3.0	275	1	Deer Park	Garner
Wisconsin/Multi Quip		D	I	3.0	185	1	Deer Park	Garner
Yamada	POLY	P	P	3.0	200	1	Deer Park	Garner
Various		D	I	2.0	200	5	Deer Park	Garner
Various		G	I	2.0	190	2	Deer Park	Garner
Versamatic	STAINLESS	P	P	2.0	140	2	Deer Park	Garner

RESPONSE BOAT TYPE CODES		TRANPORTATION METHOD CODES	
BAY	Bay Waters	**NT**	Normal Trailer
JB	Jon Boat	**WO**	Water Only
LFB	Large Flat Bottom	**WL**	Wide load Trailer
OFF	Offshore	**OT**	Other
PRO	Protected Waters		
TC	Towing Capable		
OT	Other		

RESPONSE BOATS

Name of Manufacturer	Model Number	Boat Type Code	Horse Power	Normal Crew Size	Length / Beam	Draft Limit	Number of Boats	Transport Method Code	Storage Location	Owner
Alumacraft	12	PRO	0	1	12	1’	2	NT	Deer Park	Garner
Custom Flat	1650	JB	25	2	16'	1'	4	NT	Deer Park	Garner
Custom Flat	20	LFB	40	2	20' / 6'	2'	1	NT	Deer Park	Garner
Custom Build	30	BAY	300	3	30’ / 8’	2’	1	NT	Deer Park	Garner
Alumaweld	1650	JB	25	3	16' / 6'	1'	4	NT	La Marque	Garner
Custom Boat Mfg.	1649R	JB	30	2	16' / 6'	2'	1	NT	La Marque	Garner
Alumaweld	24	JB	40	2	24’ / 6	1.6	1	NT	La Marque	Garner
Broadhead	24	BAY	150	3	24’ / 8’	2’	1	NT	La Marque	Garner
Alumaweld	1650	JB	25	2	16' / 6'	1'	5	NT	Port Arthur	Garner
Alumaweld	20	BAY	40	2	20' / 0'	2'	1	NT	Port Arthur	Garner
Alumaweld	1450	JB	25	2	14' / 0"	2"	1	NT	Port Arthur	Garner
Lobell	28’	BAY	200	3	28’ / 8’	2’	1	NT	Port Arthur	Garner
Silver Ships	30’	BAY	400	3	30’ / 8’	2	1	NT	Deer Park	Garner
Custom Boat Mfg.	1650	JB	25	2	16' / 6'	1'	6	NT	Deer Park	Garner
Duracraft	21’	LFB	40	3	21' / 6'	1’	1	NT	Deer Park	Garner
Pirogue	12’	OT	0	1	12' / 2"	3"	2	NT	Deer Park	Garner
Various	12’	JB	25	1	12' / 3"	1'	2	NT	Deer Park	Garner

SKIMMER TYPE CODES			
FS	Floating Suction	**HIP**	Hydrodynamic Inclined Plane
IV	Induced Vortex	**OB**	Oleophilic Belt
OD	Oleophilic Disk	**OR**	Oleophilic Rod
PW	Paddle-Wheel	**SK**	Sock
W	Weir	**OT**	Other

SKIMMER EQUIPMENT

Name of Manufacturer	Model Number	Skimmer Type Code	Number of Units	Mfg. Recovery Rate (gpm)	Hose Size Suction/Discharge (inches)	Time to Deploy	Storage Location	Owner
Acme Products Co., Inc.	FS400ASK-39T	W	3	275	3.0	1.5	Deer Park	Garner
Douglas Engineering	4200SH Skim-Pak	FS	2	5 - 68	2.0	5	Deer Park	Garner
Crucial Inc.	1D18P-23	OT	3	25	2.0	.5	Deer Park	Garner
Crucial Inc.	1D18P-36	OT	5	36	2.0	.5	Deer Park	Garner
Marco	Sidewinder 14	OB	1	70	3.0	.5	Deer Park	Garner
Crucial Inc.	VSP-3”	W	2	550	3.0	1.5	Deer Park	Garner
Crucial Inc.	RF-Floating Head	W	1	200	3.0	1	Deer Park	Garner
Desmi	Mini Max	W	1	220	3.0	1	La Marque	Garner
Acme Products Co., Inc.	FS400ASK-39T	W	1	275	3.0	1.0	La Marque	Garner
Crucial Inc.	1D18P-23	OT	3	25	2.0	.5	La Marque	Garner
Acme Products Co., Inc.	FS400ASK-39T	W	1	275	3.0	.5	Port Arthur	Garner
Crucial Inc.	1D18P-36	OT	3	25	2.0	.5	Port Arthur	Garner
Elastec	Double Drum	OT	1	60	2.0	.5	Port Arthur	Garner
Douglas Engineering	4200SH Skim-Pak	FS	2	5 - 68	2.0	.5	Deer Park	Garner
Marco	Sidewinder 14	OB	1	70	3.0	.5	Deer Park	Garner
Marco	Harbor 28	OB	1	70	2.0	.5	Deer Park	Garner
Elastec	Mini Max, 20"	OT	1	20	2.0	1.	Deer Park	Garner

PU	Portable Vacuum Pump Units	D	Diesel
SS	Super Sucker	E	Electric
VT	Vacuum Truck	G	Gasoline
OT	Other	H	Hydraulic
		P	Pneumatic
		OT	Other

VACUUM SYSTEM EQUIPMENT

Name of Manufacturer	Model Number	System Type Code	Drive Type Code	Suction (inches)	Number of Units	Mfg. Recovery Rate (gpm)	Storage Capacity (gallon)	Hose Invent (feet)	Storage Location	Owner
Safety Vac	449222	OT	D	14	1	40	150	200	Deer Park	Garner
Keith/Huber	LN8000	VT	D	27.0	6	80	3000	3200	La Marque	Garner
Ford	Meyers	OT	D		2	80	3000	500	La Marque	Garner
Super Products & Guzzler	5027	SS	D	27.0	1	450	3000	500	La Marque	Garner
Keith/Huber	LN8000	VT	D	27.0	1	80	3000	500	Port Arthur	Garner

SORBENT TYPE CODE		COMPOSITION CODE	
B	Boom	**M**	Mineral
PAD	Pad	**NO**	Natural Organic
PT	Particulate	**S**	Synthetic
ST	Sheet	**OT**	Other
SW	Sweep		
OT	Other		

SORBENTS

Name of Manufacturer	Model Number	Sorbent Type Code	Composition Type Code	Normal Inventory	Special Appl. Equip. Needed		Special Rcvg. Equip. Needed		Storage Location	Owner
					Yes	No	Yes	No		
Crucial, Inc.	OS-15	OT	S	1000		X		X	Deer Park	Garner
Complete Environmental Products	GES-P100	PAD	S	1000		X		X	Deer Park	Garner
Complete Environmental Products	GES-P200	PAD	S	250		X		X	Deer Park	Garner
Complete Environmental Products	GES-EP100	PAD	S	500		X		X	Deer Park	Garner
Complete Environmental Products	GES-P50	PAD	S	150		X		X	Deer Park	Garner
Complete Environmental Products	GES-B510	B	S	300		X		X	Deer Park	Garner
Complete Environmental Products	GES-B810	B	S	500		X		X	Deer Park	Garner
Complete Environmental Products	GES-R144	ST	S	150		X		X	Deer Park	Garner
Complete Environmental Products	GES-SW100	SW	S	300		X		X	Deer Park	Garner
Complete Environmental Products	GES-PART25	PT	S	10		X		X	Deer Park	Garner
Crucial, Inc.	OS-15	OT	S	150		X		X	La Marque	Garner
Complete Environmental Products	GES-P00	PAD	S	250		X		X	La Marque	Garner
Complete Environmental Products	GES-P200	PAD	S	100		X		X	La Marque	Garner
Complete Environmental Products	GES-P50	PAD	S	100		X		X	La Marque	Garner
Complete Environmental Products	GES-B510	B	S	100		X		X	La Marque	Garner
Complete Environmental Products	GES-B810	B	S	125		X		X	La Marque	Garner
Complete Environmental Products	GES-R144	ST	S	125		X		X	La Marque	Garner
Complete Environmental Products	GES-SW100	SW	S	150		X		X	La Marque	Garner
Complete Environmental Products	GES-PART25	P	S	10		X		X	La Marque	Garner

Corporate	Response Equipment Listing	Equipment Listing
Operations		Rev. January 2009

SORBENTS

Name of Manufacturer	Model Number	Sorbent Type Code	Composition Type Code	Normal Inventory	Special Appl. Equip. Needed		Special Rcvg. Equip. Needed		Storage Location	Owner
					Yes	No	Yes	No		
Crucial, Inc.	OS-15	OT	S	150		X		X	Port Arthur	Garner
Complete Environmental Products	GES-P100	PAD	S	100		X		X	Port Arthur	Garner
Complete Environmental Products	GES-P200	PAD	S	75		X		X	Port Arthur	Garner
Complete Environmental Products	GES-B510	B	S	100		X		X	Port Arthur	Garner
Complete Environmental Products	GES-B810	B	S	50		X		X	Port Arthur	Garner
Complete Environmental Products	GES-R144	ST	S	25		X		X	Port Arthur	Garner
Complete Environmental Products	GES-SW100	SW	S	50		X		X	Port Arthur	Garner
Crucial, Inc.	OS-15	OT	S	250		X		X	Deer Park	Garner
Complete Environmental Products	GES-P100	PAD	S	325		X		X	Deer Park	Garner
Complete Environmental Products	GES-P200	PAD	S	200		X		X	Deer Park	Garner
Complete Environmental Products	GES-EP100	PAD	S	500		X		X	Deer Park	Garner
Complete Environmental Products	GES-B510	B	S	100		X		X	Deer Park	Garner
Complete Environmental Products	GES-B810	B	S	150		X		X	Deer Park	Garner
Complete Environmental Products	GES-R144	ST	S	50		X		X	Deer Park	Garner
Complete Environmental Products	GES-SW100	SW	S	100		X		X	Deer Park	Garner

ICP

Annex D

MSDS

APPENDIX D
LIST OF MSDS

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HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	**:**	***AROMDIST AROMATIC DISTILLATE***
DATE ISSUED	**:**	**7/1/2004**
DATE PRINTED	**:**	**7/1/2004**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

AROMDIST AROMATIC DISTILLATE

Chemical Name and/or Family or Description:

Light aromatic hydrocarbon mixture

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA__X__ IARC__X__ NTP__X__ OTHER__X__ NONE____

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Low boiling light distillate	68410-97-9		100
CONTAINS:			
Benzene	71-43-2	0.5 ppm TWA ACTION LIMIT-OSHA 1.0 ppm TWA-OSHA 5.0 ppm STEL-OSHA 25 ppm CIELING LIMIT-OSHA (Subject to 29 CFR 1910.1028) 0.5 ppm TWA-ACGIH (A1) (SKIN) 2.5 ppm STEL-ACGIH	50.00-64.99
Toluene	108-88-3	200 ppm TWA-OSHA 300 ppm CEILING-OSHA	10.00-25.99

MSDS CODE AND NAME	: ***AROMDIST***	***AROMATIC DISTILLATE***
DATE ISSUED	: **7/1/2004**	
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COMPANY	: **HUNTSMAN**	

		50 ppm TWA-ACGIH (A3) (SKIN)	
Ethylbenzene	100-41-4	100 ppm TWA-OSHA 100 ppm TWA-ACGIH 125 ppm STEL-ACGIH	3.00-12.99
Xylenes	1330-20-7	100 ppm TWA-OSHA 100 ppm TWA-ACGIH 150 ppm STEL-ACGIH	3.00-9.99
Dicyclopentadiene	77-73-6	5 ppm TWA-ACGIH	3.00-9.99
N-butane (contains other butane isomers in unknown proportion)	106-97-8	800 ppm TWA-ACGIH	3.00-9.99
1-butene (contains other butene isomers in unknown proportion)	25167-67-3		3.00-9.99
N-pentane (contains other isomers of pentane in unknown proportion)	109-66-0	1000 ppm TWA-OSHA 600 ppm TWA-ACGIH	1.00-2.99

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Light amber liquid

Odor:

Pungent

WARNING STATEMENT

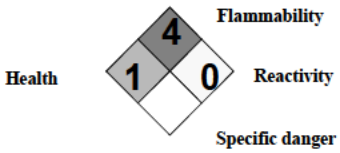
DANGER ! EXTREMELY FLAMMABLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MAY CAUSE DIZZINESS AND DROWSINESS
MAY CAUSE SKIN IRRITATION
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
CAN CAUSE DAMAGE TO LIVER, KIDNEY, AND BLOOD FORMING ORGANS

ATTENTION ! CONTAINS BENZENE - CANCER HAZARD
CONTAINS TOLUENE - WHICH MAY CAUSE NERVOUS SYSTEM DAMAGE
BASED ON ANIMAL DATA

Hazardous Material Information System (United States)

Health	2
Fire	4
Reactivity	0
Personal protection	

National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause minimal irritation, experienced as temporary discomfort.

Skin: May cause irritation with discomfort, and seen as local redness and possible swelling. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort. Prolonged, widespread, or repeated skin contact may result in the absorption of potentially harmful amounts of material. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur. Aspiration may occur during swallowing or vomiting resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Prolonged and repeated overexposure to toluene at excessive concentrations encountered upon substance abuse (i.e. addictive sniffing) may cause nervous system effects, experienced as euphoria, hallucinations, behavior changes, double vision, difficulty walking, convulsions, and coma. Permanent psychological disturbances have also been described.

Prolonged and repeated overexposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans.

Medical Conditions Aggravated by Exposure:

Overexposure may aggravate existing blood disorders, such as anemia. Repeated overexposure may aggravate existing liver or kidney disease. Repeated overexposure may aggravate or enhance existing nervous system dysfunction.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing and shoes. Get medical attention if skin irritation persists or skin contact has been prolonged.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

Overexposure to this material may sensitize the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information.

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COMPANY	:	**HUNTSMAN**

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

<-6.5 (<20°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: Not determined.
Upper: Not determined.

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Use dry chemical, foam, carbon dioxide, or water spray. Use water spray to cool fire-exposed containers.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Containers may explode in fire.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Keep away from heat, sparks or flame. Avoid breathing vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Keep container closed. Wash thoroughly after handling. Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Gloves resistant to chemicals and petroleum distillates should be worn. Exposed workers should wash exposed skin several times daily with soap and water. Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Light amber liquid

Odor:

Pungent

Boiling Point (degrees C):

29.4 (85°F)

Melting/Freezing Point (degrees C):

Not determined.

Specific Gravity (water=1):

0.85

pH:

Not applicable.

Vapor Pressure:

>70 mmHg at 20°C (68°F)

Viscosity:

1 cSt at 37.8°C (100°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

>1

Solubility in Water (%):

<0.1 [Insoluble]

Other:

None

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10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat__X__ Strong Oxidizers__X__ Others____ None of these____

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 5.00 g/kg (rat) practically non-toxic
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 3.00 - 5.00 /8.0 (rabbit) moderately irritating
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

Prolonged and repeated exposure to **benzene** has caused anemia, lymphoma, and other cancers, in laboratory animals. Benzene has been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (i.e., illness in the mother).

Prolonged and repeated exposure of laboratory animals to **toluene** vapors has caused permanent hearing loss.

This product contains **xylene**. Prolonged and repeated exposure of laboratory animals to high levels of xylene via inhalation or ingestion has caused liver and kidney effects as well as central nervous system depression. Inhalation of high concentrations has also caused hearing loss in some animal studies. Xylene has also been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (e.g. illness in the mother).

Repeated exposure to **dicyclopentadiene** has caused kidney changes in male rats.

Ethylbenzene Carcinogenicity:
A preliminary report from a chronic (lifetime) inhalation exposure study in rats and mice exposed to ethylbenzene (EB) has been recently released by the National Toxicology Program (NTP), the sponsor of the study. In this study, rats and mice (both sexes) were exposed to EB vapors at 75, 250 or 750 parts per million (ppm). In this study, male rats showed an increased incidence of kidney tumors (renal tubule adenoma or carcinoma) and testicular tumors (interstitial cell adenoma), and female rats showed an increase in kidney tumors (renal tubule adenoma). Male mice showed an increase in lung tumors (alveolar/bronchial neoplasms) and female mice showed an incidence of liver tumors (hepatocellular neoplasms). For all of the above tumors, the tumor incidence was significantly increased only at the highest exposure level of 750 ppm. In their preliminary report, NTP has concluded that there is "clear evidence" of cancer in male rats, and "some evidence" of cancer in female rats, and male and female mice.

These study findings were quite unexpected, both by NTP and industry scientists, since the results from previously-conducted subchronic exposure studies gave no indication of a potential carcinogenic effect from exposures to EB. In addition, genotoxicity studies conducted on EB have consistently shown that EB is not genotoxic.

The relevance (if any) of these tumors to humans is not known. The ACC Ethylbenzene Panel, as well as NTP, is sponsoring

additional investigations to determine the possible mechanisms of EB toxicity/carcinogenicity and the relevance of these mechanisms to human carcinogenicity.

Other ethylbenzene chronic effects:
Prolonged and repeated exposure of laboratory animals to high levels of ethylbenzene via inhalation or ingestion has cause liver and kidney effects as well as central nervous system depression. Ethylbenzene has also been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (e.g. illness in the mother).

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001 respectively. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitabilty.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Hydrocarbons, liquid, n.o.s. (Benzene, Toluene)

Hazard Class:
3

Identification Number:
UN3295

Packing Group:
I

Label Required:
FLAMMABLE LIQUID

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
HYDROCARBONS, LIQUID, N.O.S. (benzene, toluene)

Hazard Class
3

Identification Number
UN3295

Packing Group
I

Label Required
Flammable liquids

ICAO

Proper Shipping Name:

Hydrocarbons, liquid, n.o.s. (Benzene, Toluene)

Hazard Class
3

Identification Number
UN3295

Packing Group
I

Label Required
Flammable liquid

TDG

Proper Shipping Name:
FLAMMABLE LIQUIDS, N.O.S. (Benzene, Toluene)

Hazard Class:
3.1

Identification Number:
UN1993

Packing Group:
I

Label Required:
Flammable liquid

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute **Chronic** X **Fire** X **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Benzene	71-43-2	50.00-64.99
Toluene	108-88-3	10.00-25.99
Ethylbenzene	100-41-4	3.00-12.99
Xylenes	1330-20-7	3.00-9.99
Dicyclopentadiene	77-73-6	3.00-9.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Benzene	71-43-2	50.00-64.99	10
Toluene	108-88-3	10.00-25.99	1000
Ethylbenzene	100-41-4	3.00-12.99	1000
Xylenes	1330-20-7	3.00-9.99	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know

Benzene	CT, FL, IL, MA, NJ, PA, RI, MI
Toluene	CT, FL, IL, MA, NJ, PA, RI, MI
N-pentane (contains other isomers of pentane in unknown proportion)	CT, FL, MA, NJ, PA, RI
N-butane (contains other butane isomers in unknown proportion)	CT, MA, NJ, PA, RI
1-butene (contains other butene isomers in unknown proportion)	NJ, PA, RI
Ethylbenzene	CT, FL, IL, MA, NJ, PA, RI
Xylenes	CT, FL, IL, MA, NJ, PA, RI, MI
Dicyclopentadiene	CT, FL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Benzene	71-43-2
Toluene	108-88-3

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class B, Div 2: Flammable liquid
Class D, Div 2, Subdiv A: Carcinogenic
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

MSDS CODE AND NAME	**:**	***AROMDIST AROMATIC DISTILLATE***
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COMPANY	**:**	**HUNTSMAN**

16. OTHER INFORMATION 7/1/2004

"SKIN" notation in Section 2 indicates possible adverse health effects as a result of absorption through the skin, mucous membranes and eyes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*BENZENE BENZENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

BENZENE BENZENE

Chemical Name and/or Family or Description:

Aromatic hydrocarbon

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA__X__ IARC__X__ NTP__X__ OTHER__X__ NONE____

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Benzene	71-43-2	0.5 ppm TWA ACTION LIMIT-OSHA 1.0 ppm TWA-OSHA 5.0 ppm STEL-OSHA 25 ppm CIELING LIMIT-OSHA (Subject to 29 CFR 1910.1028) 0.5 ppm TWA-ACGIH (A1) (SKIN) 2.5 ppm STEL-ACGIH	100.00

MSDS CODE AND NAME	:	*BENZENE BENZENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

Odor:

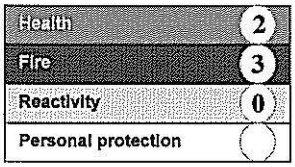
Sweet, characteristic odor

WARNING STATEMENT

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MAY CAUSE DIZZINESS AND DROWSINESS
MAY CAUSE EYE IRRITATION
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
CAN CAUSE DAMAGE TO LIVER, KIDNEY, AND BLOOD FORMING ORGANS

WARNING! CANCER HAZARD

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion__X__

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects. Prolonged, widespread, or repeated skin contact may result in the absorption of potentially harmful amounts of material.

Inhalation: Vapors or mist may cause irritation of the nose and throat. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Inhalation may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

MSDS CODE AND NAME	:	***BENZENE BENZENE***
DATE ISSUED	:	**7/1/2004**
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COMPANY	:	**HUNTSMAN**

Prolonged and repeated overexposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing liver or kidney disease. Overexposure may aggravate existing blood disorders, such as anemia.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing. Destroy non-resistant footwear. Get medical attention if skin irritation persists or contact has been prolonged.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

497.8 (928°F)

Flash Point (degrees C):

-11.1 (12°F) (CC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 7.1

Recommended Fire Extinguishing Agents And Special Procedures:

Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, alcohol resistant foam or carbon dioxide to extinguish fire.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Heating greatly increases explosive hazard.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Keep away from heat, sparks or flame. Use with adequate ventilation. Avoid breathing vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container closed. Wash thoroughly after handling. Use spark-proof tools.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Gloves resistant to chemicals and petroleum distillates required. NIOSH has indicated that gloves made of Viton rubber or polyvinyl alcohol provide reasonable protection from benzene. When handling large quantities, impervious suits, gloves, and rubber boots must be worn. Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Benzene (Subject to 29 CFR 1910.1028)
0.5 ppm TWA ACTION LIMIT-OSHA
1.0 ppm TWA(8 hour)-OSHA
5.0 ppm STEL(15 min)-OSHA
25 ppm CEILING LIMIT-OSHA
0.5 ppm TWA(8 hour)-ACGIH (SKIN)
2.5 ppm STEL(15 min)-ACGIH
Listed in Appendix A1 - Confirmed Human Carcinogen

MSDS CODE AND NAME	: *BENZENE*	*BENZENE*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Sweet, characteristic odor

Boiling Point (degrees C):

80 (176°F)

Melting/Freezing Point (degrees C):

5.6 (42°F)

Specific Gravity (water=1):

0.8835

pH:

Not applicable.

Vapor Pressure:

74 mmHg at 40°C (104°F)

Viscosity:

<20 cSt at 40°C (104°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

2.7

Solubility in Water (%):

<0.1 [Insoluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat__X__ Strong Oxidizers__X__ Others__X__ None of these____

Comments:

This material is incompatible with halogens, nitric acid, and perchlorates.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

MSDS CODE AND NAME	: *BENZENE*	*BENZENE*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 3.3 g/kg (rat) slightly toxic
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize)Believed to be > 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

Prolonged and repeated exposure to benzene has caused anemia, lymphoma, and other cancers, in laboratory animals. Benzene has been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (i.e., illness in the mother).

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001 respectively. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitabilty.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Benzene

Hazard Class:
3

Identification Number:
UN1114

Packing Group:
II

Label Required:
FLAMMABLE LIQUID

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

MSDS CODE AND NAME	:	***BENZENE BENZENE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire__X__ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Benzene	71-43-2	100.00

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Benzene	71-43-2	100.00	10

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Benzene	CT, FL, IL, MA, MI, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Benzene	71-43-2

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class B, Div 2: Flammable liquid
Class D, Div 2, Subdiv A: Carcinogenic

MSDS CODE AND NAME	:	*BENZENE BENZENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.
"SKIN" notation in Section 2 indicates possible adverse health effects as a result of absorption through the skin, mucous membranes and eyes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

MSDS CODE AND NAME	: *BENZENE*	*BENZENE*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	***BDEFIN BUTADIENE; 1,3 - BUTADIENE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

BDEFIN BUTADIENE; 1,3 - BUTADIENE

Chemical Name and/or Family or Description:

Olefin

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA X **IARC** X **NTP** X **OTHER** X **NONE**

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Butadiene, 1,3-	106-99-0	2 ppm TWA-ACGIH-(A2) 1 ppm TWA-OSHA (Subject to 29 CFR 1910.1051) 5 ppm STEL-OSHA	95.00-99.99

MSDS CODE AND NAME	:	***BDEFIN BUTADIENE; 1,3 - BUTADIENE***
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COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

Odor:

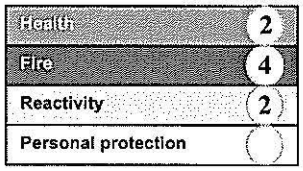
Aromatic odor

WARNING STATEMENT

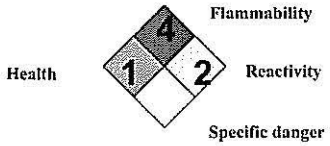
DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
MAY FORM EXPLOSIVE PEROXIDES ON EXPOSURE TO AIR
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT
CONTAINS 1,3-BUTADIENE - CANCER HAZARD

ATTENTION !

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

An epidemiology study conducted at the former Texaco Chemical Company 1,3-butadiene manufacturing facility (subsequently acquired by the Huntsman Corporation) and updated through 1990 showed that the workers had a lower overall death rate than the general U.S. population. There was a two-fold increase in mortality from lymphosarcoma and reticulum cell sarcoma. However, the increase was not consistently seen in all job groups potentially exposed to higher levels of 1,3-butadiene. In addition, the increase was seen primarily in short term workers whose employment began during World War II and not in those employed ten years or more.

This pattern of results suggests that exposure to 1,3-butadiene was not responsible for the increase lymphosarcomas. This study has now been updated through 1994. Preliminary findings from this most recent update indicate that the overall death rate, and the death rate due to cancer among employees who worked at the plant from 1942 to 1994 continue to be lower than expected. A slight increase in the number of deaths from cancers of other lymphatic tissues among long term employees was observed. These deaths involved employees hired prior to 1950. Numerous control measures have been incorporated into the facility since that time, thereby significantly reducing workplace exposures. A thorough review of these findings is currently underway.

Several other studies involving workers manufacturing styrene-butadiene rubber have shown increases of leukemia and lymphomas. These workers were potentially exposed to 1,3-butadiene and other chemicals, especially styrene and possibly benzene. Due to the presence of multiple chemicals and inconsistent results, these studies do not demonstrate 1,3-butadiene exposure to be responsible for increased leukemia or lymphoma in these workers.

Additional information concerning 1,3-butadiene toxicity in experimental animals is located in Section 11 (Toxicological Information).

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

OSHA has defined 1,3-butadiene as a cancer hazard.

The current International Agency for Research on Cancer (IARC) classification of 1,3-butadiene is class 2A, meaning that IARC finds that there is limited evidence of 1,3-butadiene carcinogenicity in humans, and sufficient evidence of 1,3-butadiene carcinogenicity in experimental animals.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

None

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COMPANY	:	**HUNTSMAN**

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

428.9 (804 F)

Flash Point (degrees C):

Not applicable.

Flammable Limits % (Lower-Upper):

Lower: 2
Upper: 12

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Extremely flammable. Flashback may occur along vapor trail. May form explosive peroxides on exposure to air. Containers may explode in fire.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all sources of ignition. Ventilate area of spill or leak. Stop flow of liquid at source if possible. Prevent liquid from entering sewers. Dilute with water fog. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Avoid contact with eyes, skin, and clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Do not contact with copper or copper alloys as explosive copper compounds may be formed.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition. Protect containers against static electricity, lightning, and physical damage. Must be kept inhibited during storage and shipment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown. Please refer to the OSHA standard for 1,3-butadiene (29 CFR 1910.1051) for specific respiratory protection information for exposures to 1,3-butadiene.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Butadiene: OSHA PEL-TWA 1 ppm (Subject to 29 CFR 1910.1051)
OSHA STEL 5 ppm
ACGIH TLV-TWA 2.0 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Aromatic odor

Boiling Point (degrees C):

-4.7 (23.5 F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

.62

pH:

Not applicable.

Vapor Pressure:

1810 mmHg at 20 C (68 F)

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

1.8

Solubility in Water (%):

.1 - 1

Other:

None

MSDS CODE AND NAME	:	***BDEFIN BUTADIENE; 1,3 - BUTADIENE***
DATE ISSUED	:	**7/1/2004**
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COMPANY	:	**HUNTSMAN**

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others** X **None of these**

Comments:

This material may also react with reducing agents, copper, and copper alloys.

Products Evolved When Subjected to Heat or Combustion:

Carbon monoxide and carbon dioxide may be formed on burning in a limited air supply. May spontaneously dimerize to 4-vinyl-1-cyclohexene in a temperature-dependent reaction. Vapors may form polymers which block vents or flame arrestors.

Hazardous Polymerizations:

OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Not applicable; material is a gas.
Inhalation:
4 hr. LC50 > 99000.00 ppm (gas
Dermal:
LD50 Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be > 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

See "Other Information", Section 16 for Toxicological Data regarding 1,3-butadiene.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Butadienes, stabilized

Hazard Class:
2.1

MSDS CODE AND NAME	:	***BDEFIN BUTADIENE; 1,3 - BUTADIENE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

Identification Number:
UN 1010

Packing Group:

Label Required:
Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Butadienes, stabilized

Hazard Class
2.1

Identification Number
UN 1010

Packing Group

Label Required
Flammable gas

ICAO

Proper Shipping Name:
Butadienes, stabilized

Hazard Class
2.1

Identification Number
UN 1010

Packing Group

Label Required
Flammable gas

TDG

Proper Shipping Name:
Butadienes, stabilized

Hazard Class:
2.1

Identification Number:
UN 1010

Label Required:
Flammable gas

MSDS CODE AND NAME	:	***BDEFIN BUTADIENE; 1,3 - BUTADIENE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute X **Chronic** X **Fire** X **Pressure** X **Reactive** X **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Butadiene, 1,3-	106-99-0	95.00-99.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Butadiene, 1,3-	106-99-0	95.00-99.99	10

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Butadiene, 1,3-	FL, IL, MA, NJ, PA, RI, MI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Butadiene, 1,3-	106-99-0

INTERNATIONAL REGULATIONS:

Export Notification (TSCA-12b):
This product may be subject to export notification under TSCA section 12(b); contains: 4-vinylcyclohexene

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 2, Subdiv A: Carcinogenic Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	: ***BDEFIN***	***BUTADIENE; 1,3 - BUTADIENE***
DATE ISSUED	: **7/1/2004**	
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COMPANY	: **HUNTSMAN**	

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Expected to biodegrade in the environment.

Potential to Bioaccumulate:

Not expected to bioaccumulate (log Kow = 1.99)

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Please note that this product, or a component of this product, contains 1,3-butadiene. The U.S. Occupational and Health Administration (OSHA) has recently issued a new workplace exposure standard for 1,3-butadiene (29 CFR 1910.1051).

This standard, published in the November 4, 1996 issue of the Federal Register (61 FR 56746), contains significant scientific information in the preamble, and the specific elements for compliance to this standard. The effective date of this standard is February 3, 1997, although some sections become effective on other dates. As a purchaser and user of products containing 1,3-butadiene, it is strongly recommended that you review and understand this standard and determine its applicability to your workplace.

Prolonged and repeated inhalation of 1,3-butadiene has produced tumors in multiple sites in rats and mice. In Sprague-Dawley rats exposed to 1000 or 8000 ppm butadiene, tumor sites have included the mammary gland, thyroid, and testes. The National Toxicology Program concluded there was "clear evidence" of carcinogenicity in B6C3F1 mice exposed to 6.25 ppm to 1250 ppm butadiene. This was based on increased tumors in the hematopoietic system, heart, lung, forestomach, liver and harderian gland in males and females, preputial gland, brain, and kidney (males), and in ovary and mammary gland (females). IARC has concluded that there is sufficient evidence for 1,3-butadiene carcinogenicity in experimental animals. Repeated exposure to 1,3-butadiene has produced genetic toxicity, bone marrow toxicity, and anemia in the mouse. Noncarcinogenic damage to the ovary, testes, liver, nasal tissue, and forestomach have also been observed in the mouse, and evidence of kidney damage has been observed in the rat. Exposure of pregnant rodents to maternally toxic 1,3-butadiene concentrations has affected the developing fetus. Malformations (birth defects) have been reported in the developing fetus of pregnant rats exposed to 8000 ppm 1,3-butadiene. There was no evidence of teratogenic effects in a second developmental study in the rat or a developmental study in the mouse, both involving butadiene exposures up to 1000 ppm.

The B6C3F1 mouse has been demonstrated to be substantially more susceptible to toxic and carcinogenic responses to 1,3-butadiene exposure than the Sprague-Dawley rat. Repeated exposure to 6.25 ppm 1,3-butadiene has produced lung tumors and ovarian atrophy in females, and evidence of genetic toxicity in males and females of this mouse strain. By contrast, evidence for toxic and carcinogenic responses in the rat is more limited and has been observed primarily following prolonged exposure to 1,3-butadiene concentrations of 1000 ppm or higher.

In an effort to explain the higher toxic and carcinogenic potency of 1,3-butadiene in the mouse and evaluate the relevance of these animal bioassay results to humans, pharmacokinetic and metabolism studies have been conducted using rodents, monkeys, and tissues from rodents and humans. The results of these studies suggest that the mouse may not be an appropriate model from which to predict human health effects from exposure to 1,3-butadiene.

See Section 3 (Hazard Identification) for additional health effects information for 1,3-butadiene.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Supercedes: 3/31/2003 **The following section has been revised: 13**

Date Issued: 7/1/2004.

MSDS CODE AND NAME	:	***BDEFIN BUTADIENE; 1,3 - BUTADIENE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	***C5RAFF C5 RAFFINATE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

C5RAFF C5 RAFFINATE

Chemical Name and/or Family or Description:

Hydrocarbon

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC X NTP X OTHER X NONE

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Hydrocarbons, C4-6, C5-rich	068476-43-7		100

SEE SECTION 8 FOR PRODUCT EXPOSURE LIMIT INFORMATION

MSDS CODE AND NAME	:	***C5RAFF C5 RAFFINATE***
DATE ISSUED	:	**7/1/2004**
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COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas or liquid

Odor:

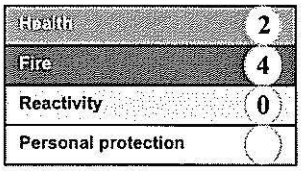
Hydrocarbon odor

WARNING STATEMENT

DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
CONTAINS 1,3-BUTADIENE -
MAY CAUSE CANCER BASED ON ANIMAL DATA

ATTENTION !

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may cause irritation of the nose and throat, headache, nausea, and drowsiness. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion.

Sensitization Properties: Unknown

Chronic:

An epidemiology study conducted at the former Texaco Chemical Company 1,3-butadiene manufacturing facility (subsequently acquired by the Huntsman Corporation) and updated through 1990 showed that the workers had a lower overall death rate than the general U.S. population. There was a two-fold increase in mortality from lymphosarcoma and reticulum cell sarcoma. However, the increase was not consistently seen in all job groups potentially exposed to higher levels of 1,3-butadiene. In addition, the increase was seen primarily in short term workers whose employment began during World War II and not in those employed ten years or more. This pattern of results suggests that exposure to 1,3-butadiene was not responsible for the increase lymphosarcomas. This study has now been updated through 1994. Preliminary findings from this most recent update indicate that the overall death rate, and the death rate due to cancer among employees who worked at the plant from 1942 to 1994 continue to be lower than expected. A slight increase in the number of deaths from cancers of other lymphatic tissues among long term employees was observed. These deaths involved employees hired prior to 1950. Numerous control measures have been incorporated into the facility since that time, thereby significantly reducing workplace exposures. A thorough review of these findings is currently underway. Several other studies involving workers manufacturing styrene-butadiene rubber have shown increases of leukemia and lymphomas. These workers were potentially exposed to 1,3-butadiene and other chemicals, especially styrene and possibly benzene. Due to the presence of multiple chemicals and inconsistent results, these studies do not demonstrate 1,3-butadiene exposure to be responsible for increased leukemia or lymphoma in these workers. The current International Agency for Research on Cancer (IARC) classification of 1,3-butadiene is class 2A, meaning that IARC finds that there is limited evidence of 1,3-butadiene carcinogenicity in humans, and sufficient evidence of 1,3-butadiene carcinogenicity in experimental animals. Additional information concerning 1,3-butadiene toxicity in experimental animals is located in Section 11 (Toxicological Information).

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at ambient temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

< 0 (32 F)

Flammable Limits % (Lower-Upper):

Lower: Not Determined
Upper: Not Determined

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

No special equipment or procedures required.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

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DATE ISSUED	:	**7/1/2004**
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COMPANY	:	**HUNTSMAN**

None established for product; component exposure limits are as follows:
Butadiene: OSHA PEL-TWA 1 ppm (8 hr.) ACGIH TLV-TWA 2.0 ppm.
Butane: ACGIH TLV-TWA 800 ppm.
Methyl-tert-butyl ether: ACGIH TLV-TWA 40 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas or liquid

Odor:

Hydrocarbon odor

Boiling Point (degrees C):

< 30 (< 86F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

approx. 0.6

pH:

Not applicable.

Vapor Pressure:

> 200 mmHg

Viscosity:

<20 cSt at 40 C (104 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

Not determined.

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others** X **None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

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COMPANY	:	**HUNTSMAN**

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
LD50 Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
Believed to be > 25.00 - 50.00 /110 (rabbit) moderately irritating
Sensitization:
Not determined. (Draize)
(Draize)

Other:

See "Other Information", Section 16 for Toxicological Data regarding 1,3-butadiene.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class:
2.1

Identification Number:
UN 1075

Packing Group:

Label Required:
Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:

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COMPANY	:	**HUNTSMAN**

Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute Chronic X Fire X Pressure X Reactive N/A

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Butadiene, 1,3-	106-99-0	0.01-0.99
Methyl-t-butyl ether	1634-04-4	0.01-19.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Butadiene, 1,3-	106-99-0	0.1-0.99	10
Methyl-t-butyl ether	1634-04-4	.01-19.99	1000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Butadiene, 1,3-	FL, IL, MA, NJ, PA, RI, MI
Butane,normal	IL, MA, NJ, PA, RI
Butylene	FL, MA, NJ, PA
2- butene	NJ, PA
Isobutylene	FL, MA, NJ, PA
Isobutane	MA, NJ, PA
Isopentane	FL,MA,NJ,PA
Methyl-t-butyl ether	MA,NJ,PA

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Butadiene, 1,3-	106-99-0

INTERNATIONAL REGULATIONS:

Export Notification (TSCA-12b): This product may be subject to export notification under TSCA section 12(b); contains: Methyl-t-butyl ether

TSCA Inventory Status:

This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Not determined

Canadian Inventory Status:
Not determined.

EINECS Inventory Status:
Not determined.

Australian Inventory Status:
Not determined.

Japan Inventory Status:
Not determined.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Prolonged and repeated inhalation of 1,3-butadiene has produced tumors in multiple sites in rats and mice. In Sprague-Dawley rats exposed to 1000 or 8000 ppm butadiene, tumor sites have included the mammary gland, thyroid, and testes. The National Toxicology Program concluded there was "clear evidence" of carcinogenicity in B6C3F1 mice exposed to 6.25 ppm to 1250 ppm butadiene. This was based on increased tumors in the hematopoietic system, heart, lung, forestomach, liver and harderian gland in males and females, preputial gland, brain, and kidney (males), and in ovary and mammary gland (females). IARC has concluded that there is sufficient evidence for 1,3-butadiene carcinogenicity in experimental animals.

Repeated exposure to 1,3-butadiene has produced genetic toxicity, bone marrow toxicity, and anemia in the mouse. Noncarcinogenic damage to the ovary, testes, liver, nasal tissue, and forestomach have also been observed in the mouse, and evidence of kidney damage has been observed in the rat. Exposure of pregnant rodents to maternally toxic 1,3-butadiene concentrations has affected the developing fetus. Malformations (birth defects) have been reported in the developing fetus of pregnant rats exposed to 8000 ppm 1,3-butadiene. There was no evidence of teratogenic effects in a second developmental study in the rat or a developmental study in the mouse, both involving butadiene exposures up to 1000 ppm.

The B6C3F1 mouse has been demonstrated to be substantially more susceptible to toxic and carcinogenic responses to 1,3-butadiene exposure than the Sprague-Dawley rat. Repeated exposure to 6.25 ppm 1,3-butadiene has produced lung tumors and ovarian atrophy in females, and evidence of genetic toxicity in males and females of this mouse strain. By contrast, evidence for toxic and carcinogenic responses in the rat is more limited and has been observed primarily following prolonged exposure to 1,3-butadiene concentrations of 1000 ppm or higher.

MSDS CODE AND NAME	:	***C5RAFF C5 RAFFINATE***
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In an effort to explain the higher toxic and carcinogenic potency of 1,3-butadiene in the mouse and evaluate the relevance of these animal bioassay results to humans, pharmacokinetic and metabolism studies have been conducted using rodents, monkeys, and tissues from rodents and humans. The results of these studies suggest that the mouse may not be an appropriate model from which to predict human health effects from exposure to 1,3-butadiene.

See Section 3 (Hazard Identification) for additional health effects information for 1,3-butadiene.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

32609

MSDS Number: C0357 Effective Date: 12/8/96

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance

CALCIUM CHLORIDE

1. Product Identification

Synonyms: calcium dichloride; calcium chloride anhydrous; Caltac®; Dowflake
CAS No: 10043-52-4
Molecular Weight: 110.98
Chemical Formula: $CaCl_2$
Product Codes: **J.T. Baker:**
1311
Mallinckrodt:
0771, 3266, 3630, 4225, 4748, 4777, 4822, 4870, 4875, 4880

2. Composition/Information on Ingredients

Ingredient	CAS No.	Percent	Hazardous
Calcium Chloride	10043-52-4	93 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR INHALED.

J.T. Baker SAF-T-DATA(tm) Ratings

(Provided here for your convenience)

Health:	Flammability:	Reactivity:	Contact:
1 - Slight	0 - None	0 - None	2 - Moderate

Lab Protection Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:

Granular material does not pose a significant inhalation hazard, but inhalation of dust may cause irritation to the respiratory tract, with symptoms of coughing and shortness of breath.

Ingestion:

Low toxicity material but ingestion may cause serious irritation of the mucous membrane due to heat of hydrolysis. Large amounts can cause gastrointestinal upset, vomiting, abdominal pain.

Skin Contact:

Solid may cause mild irritation on dry skin; strong solutions or solid in contact with moist skin may cause severe irritation, even burns.

Eye Contact:

Hazard may be either mechanical abrasion or, more serious, burns from heat of hydrolysis and chloride irritation.

Chronic Exposure:

No information found.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

Oral ingestion may cause serum acidosis.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. At high temperatures or when moistened under fire conditions, calcium chloride may produce toxic or irritating fumes.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. Small amounts of residue may be flushed to sewer with plenty of water.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Moist calcium chloride and concentrated solutions can corrode steel. When exposed to the atmosphere, calcium chloride will absorb water and form a solution. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirator (NIOSH Approved)

For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Maintain good housekeeping in work area. Dust deposits on floors and other surfaces may pick up moisture and cause the surfaces to become slippery and present safety hazards.

9. Physical and Chemical Properties

Appearance:
White or gray-white granules.

Odor:
Odorless.

Solubility:
Freely soluble in water, exothermic.

Density:
2.15

pH:
8 - 9 Aqueous solution

% Volatiles by volume @ 21°C (70°F):
0

Boiling Point:
> 1600°C (> 2912°F)

Melting Point:
772°C (1422°F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
No information found.

Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage. Substance will pick up moisture from the air and go into solution if exposed in open containers.

Hazardous Decomposition Products:

Emits toxic chlorine fumes when heated to decomposition. May form hydrogen chloride in presence of sulfuric or phosphoric acids or with water at elevated temperatures.

Hazardous Polymerization:

Will not occur.

Incompatabilities:

Methyl vinyl ether, water, zinc, bromine trifluoride, mixtures of lime and boric acid, barium chloride, and 2-furan percarboxylic acid. Metals will slowly corrode in aqueous calcium chloride solutions. Aluminum (and alloys) and yellow brass will be attacked by calcium chloride.

Conditions to Avoid:

Incompatibles.

11. Toxicological Information

Oral rat LD50: 1000 mg/kg. Investigated as a tumorigen and mutagen.

Cancer Lists

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Calcium Chloride (10043-52-4)	No	No	None

12. Ecological Information

Environmental Fate:

Based on available information for Calcium Chloride anhydrous, this material will not biodegrade or bioaccumulate.

Environmental Toxicity:

The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

Chemical Inventory Status

						---Canada---		
Ingredient	TSCA	EC	Japan	Australia	Korea	DSL	NDSL	Phil.
Calcium Chloride (10043-52-4)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Federal, State & International Regulations

	---SARA 302---		----------SARA 313----------			-RCRA-	-TSCA-
Ingredient	RQ	TPQ	List	Chemical Catg.	CERCLA	261.33	8(d)
Calcium Chloride (10043-52-4)	No	No	No	No	No	No	No

Chemical Weapons Convention: No **TSCA 12(b):** No **CDTA:** No

SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No Reactivity: No (Pure / Solid)

Australian Hazchem Code: No information found. **Australian Poison Schedule:** No information found.

WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings:

Health: 1 Flammability: 0 Reactivity: 1

Label Hazard Warning:

WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. HARMFUL IF SWALLOWED OR INHALED.

Label Precautions:

Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 1. New 16 section MSDS format, all sections have been revised.

Disclaimer:

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Prepared By: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

Ciba Specialty Chemicals Corporation
USA

2301 Wilroy Road
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Suffolk, VA 23434

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24-Hour Health/Environmental Emergency Phone: (800)873-1138

Ciba

Value beyond chemistry

Effective Date: 7/9/01 **Material Safety Data Sheet** MSDS No: 14581

SECTION 1. PRODUCT IDENTIFICATION

Trade Name: ZETAG 7878 FS40

Chemical Family: Copolymer of a quaternary acrylate salt and acrylamide dispersed in mineral oil.
Intended Use: Flocculant

Health	1
Flammability	1
Reactivity	0
Protective Equipment	X

HMIS RATING

Former Tradename:
PERCOL 778 FS40

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

OSHA	CAS No.	CHEMICAL IDENTITY	EXPOSURE LIMITS					CARCINOGEN STATUS		
			ACGIH		OSHA		MFR.	IARC	NTP	OSHA
			TWA	STEL	PEL	STEL				
*	124-04-9	ADIPIC ACID	5 mg/m3	NE	NE	NE	NE	NR	NR	NR
*	64742-53-6	HYDROTREATED LIGHT NAPHTHENIC DISTILLATE	NE	NE	NE	NE	NE	NR	NR	NR
*	68002-97-1	Alcohols, C10-16, Ethoxylated	NE	NE	NE	NE	NE	NR	NR	NR
*	68412-54-4	NONYLPHENOXYPOLY(ETHYLENE)ETOH, BRANCHED	NE	NE	NE	NE	NE	NR	NR	NR
*	69418-26-4	COPOLYMER ACRYLAMIDE: DMAEA Q.(MeCl)	NE	NE	NE	NE	NE	NR	NR	NR
*	8052-41-3	STODDARD SOLVENT, ALIPHATIC HYDROCARBONS	100 ppm	NE	500 ppm	NE	NE	NR	NR	NR

NE = Not Established NR = Not Reviewed * = OSHA Hazardous Ingredient

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview:

Description: White or off-white liquid. Slight, mild odor.

Statement of Hazards: Eye and skin irritant.

Primary Route(s) of Entry: Eye or Skin contact.

Signs and Symptoms of Exposure: Contact with the eye may produce irritation and/or redness. Prolonged or repeated skin contact tends to remove skin oils, possibly leading to dry skin, irritation and/or dermatitis. Vapors may irritate eyes and respiratory tract, and result in headache or dizziness.

Carcinogenicity: Not listed as a carcinogen by IARC, NTP, OSHA or ACGIH

Medical Conditions Aggravated by Exposure: Existing skin conditions.

Target Organ(s): Eyes, skin

SECTION 4. FIRST AID MEASURES

Ingestion: Consult a physician. Never give anything by mouth to an unconscious person.

Skin: Remove contaminated clothing and launder before reuse. Wash effected area with soap and water.

Inhalation: Remove to fresh air. If symptoms persist, consult a physician.

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

SECTION 5. FIRE FIGHTING MEASURES

Flash Point:	> 200° F (> 93 ° C)
Flash Point Method Used:	PMCC
Flammable Limits in Air (Lower - % by volume):	Not Evaluated
Flammable Limits in Air (Upper - % by volume):	Not Evaluated
Autoignition:	Not Evaluated

Sensitivity to Mechanical Impact: None

Sensitivity to Static Discharge: None

Fire Fighting Extinguishing Media: Carbon dioxide, dry chemical or foam.

Fire Fighting Equipment: Firefighters should wear normal protective equipment. SCBA is recommended for confined areas. Cool exposed drums or tanks with water.

Fire and Explosion Hazards: Wetted product presents an extreme slip hazard. Pedestrian and vehicular traffic must proceed with caution where even a small amount of wet product may exist.

Extinguishing Media to Avoid: Water may create a slip hazard with product.

Hazardous Combustion Products: Oxides of carbon and nitrogen.

Emergency Response Guidebook Information: No ERG Guide cited. Handle as combustible material.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Remove all ignition sources. Dike area to control runoff, and collect spill in appropriate container(s). Use an inert absorbant such as vermiculite to collect residual liquid. Then water wash area to waste treatment to eliminate slip hazard.

SECTION 7. HANDLING AND STORAGE

Precautions: Avoid high temperatures and open systems to minimize vapor release and exposures. Keep containers closed and properly labelled. Do not reuse containers before contents are completely removed, and the container is properly cleaned and reconditioned. (Refer also to Section VII) Good personal hygiene practices can reduce potential exposure. Wash with soap and water following any contact with this product, as well as before breaks and meals. Shower and change clothing at end of work shift. If clothing becomes contaminated, remove and launder or dry-clean before reuse. Avoid high temperatures and open systems to minimize vapor release and exposures. Keep containers closed and properly labelled. Do not reuse containers before contents are completely removed, and container is properly cleaned and reconditioned. Good personal hygiene practices can reduce potential exposure. Wash with soap and water following any contact with this product, as well as before breaks and meals. Shower and change clothing at end of work shift. If clothing becomes contaminated, remove and launder or dry-clean before reuse.

Storage Information: Avoid storage temperatures below freezing (32 F). Product may stratify.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Skin Protection: Chemical resistant gloves.

Respiratory Protection: Use NIOSH approved respirator for organic vapor and/or mist, as required to control exposure.

Eye Protection: Full sideshield safety glasses or goggles (ANSI Z87.1 standard).

Engineering Controls: Recommended general ventilation rate of, as a minimum, 10 air changes per hour.

Additional Information: Provide eyewash station(s). Select additional protective equipment (eg apron, face shield, etc.), depending on conditions of use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Liquid dispersion
Color:	White to off-white
Odor:	Slight hydrocarbon oil like odor
Odor Threshold:	Not applicable
Physical State:	Liquid
Solubility in Water:	Readily Dispersible
Vapor Pressure:	Not Evaluated
Specific Gravity:	1.06
Boiling Point:	> 212° F (> 100 ° C)
Melting Point:	Not Applicable
Freezing Point:	Not Evaluated
Decomposition Temperature:	Not Evaluated
Evaporation Rate:	Not Evaluated
Vapor Density:	Not Evaluated
VOC:	Not Evaluated

pH: Not Applicable
Coefficient of water/oil: Not Evaluated

Percent Volatile:
Not evaluated.

SECTION 10. STABILITY AND REACTIVITY

Materials to Avoid: Strong oxidants.

Stability: Stable.

Hazardous Polymerization: Will not occur.

Hazardous Decomposition Products: Thermal decomposition or combustion may produce oxides of carbon and nitrogen, various hydrocarbons, ammonia and/or hydrogen chloride vapor. Vapor may be irritating or harmful.

Incompatibility: Strong oxidants such as liquid chlorine, enriched gaseous or liquid oxygen, and sodium or calcium hypochlorite.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity:
Low oral toxicity.

Acute Dermal Toxicity:
8052-41-3 STODDARD SOLVENT, ALIPHATIC HYDROCARBONS
LD50(Rabbit): > 3 g/kg.

Acute Inhalation Toxicity:
8052-41-3 STODDARD SOLVENT, ALIPHATIC HYDROCARBONS
LC50 (rat): > 5500 mg/m³, 4h.
LC50 (dog): > 8 g/m³, 8h.

Carcinogenicity:
Not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

Reproductive Toxicity:
No data for product. No effects anticipated.

Teratoginicity:
No data for product. No effects anticipated.

Mutagenicity:
No data for product. No effects anticipated.

Skin Irritation:
1338-43-8 SORBITAN MONOOLEATE
Not an irritant.

68002-97-1 Alcohols, C10-16, Ethoxylated
Corrosive

Eye Irritation:
124-04-9 ADIPIC ACID
Severe (Rabbit).

1338-43-8 SORBITAN MONOOLEATE
Not an irritant.

8052-41-3 STODDARD SOLVENT, ALIPHATIC HYDROCARBONS
Moderate (Rabbit).

68002-97-1 Alcohols, C10-16, Ethoxylated
Severe (in unwashed eyes).

Acute Eye Exposure Effects:
69418-26-4 COPOLYMER ACRYLAMIDE: DMAEA Q.(MeCl)
Product may cause temporatory irritation which should cease upon removal of product. May require extensive irrigation to remove product from eye.

Sensitization:
1338-43-8 SORBITAN MONOOLEATE
Not a sensitizer.

Photosensitivity:
1338-43-8 SORBITAN MONOOLEATE
Not a photoallergenic.

Phototoxicity:
1338-43-8 SORBITAN MONOOLEATE
Not photoxic.

Sub-Chronic:
124-04-9 ADIPIC ACID
Male and female rats exposed to adipic acid in the form of aerosol dust (126 ug/L) for 6 hours a day for 15 days showed no signs of toxicity.

1338-43-8 SORBITAN MONOOLEATE
Rats were given dietary concentratons of up to 10% for 16 weeks. Liver and kidney changes were seen only at the 10% level.

8052-41-3 STODDARD SOLVENT, ALIPHATIC HYDROCARBONS
Kidney toxicity in the rat (330 ppm, 65 days, inhalation).
Dermatitis in the rabbit (2 g/kg, 4 weeks, dermal).

Chronic Toxicity:
1338-43-8 SORBITAN MONOOLEATE
Rats were fed a 5% concentration in the diet for 2 years. No adverse effects were seen.

Toxicologically Synergistic Products:
None known.

SECTION 12. ECOLOGICAL INFORMATION

Ecological Information:
This product contains cationic polymer(s) that may be toxic to aquatic organisms when tested in pure (distilled) water. Toxicity is greatly reduced by particles in natural water.

Biodegradability:
1338-43-8 SORBITAN MONOOLEATE
Japanese MITI: Chemical substance judged to be biodegradable.

Fish Toxicity:
124-04-9 ADIPIC ACID
96 hr LC50 (Fathead minnow): 97 mg/L.

69418-26-4 COPOLYMER ACRYLAMIDE: DMAEA Q.(MeCl)
Contains a cationic polyacrylamide. Cationic polyacrylamides are very toxic to aquatic organisms (LC50 values usually < 1 ppm): however, aquatic toxicity is reduced by factors of 10 to 100 times in the presence of 5 to 10 mg/l organic carbon as is found in most surface waters.

Invertebrate Toxicity:
69418-26-4 COPOLYMER ACRYLAMIDE: DMAEA Q.(MeCl)
48 hr. LC50 (daphnia): < 2 ppm.

Bioaccumulation:
124-04-9 ADIPIC ACID
BCF = 0.68

SECTION 13. DISPOSAL CONSIDERATIONS

RCRA Hazard Class: This product, when unadulterated, is not a RCRA regulated hazardous waste.

Waste Disposal Method: Disposal must be arranged in accordance with local, state and federal regulations. Care must be taken to prevent environmental contamination from the disposal of material, residues and containers.

SECTION 14. TRANSPORT INFORMATION

DOT:
Proper Shipping Name: NOT A DOT/IMO HAZARDOUS MATERIAL

SECTION 15. REGULATORY INFORMATION

US Federal Regulations:

Chemical Weapons Convention (CWC): This product does not contain any chemicals listed under the Chemical Weapons Convention Schedules of Chemicals.

Clean Air Act -Hazardous Air Pollutants (HAP): The following chemical(s) are listed as hazardous air pollutants (HAP) under the U.S. Clean Air Act Section 12 (40 CFR 61):

Chemical Name: ACRYLAMIDE
CASRN: 79-06-1
Percent in Composition: <0.1 % by wt

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

Clean Water Act - Priority Pollutants (PP): This product does not contain any priority pollutants listed under the U.S. Clean Water Act Section 307 (2)(1) Priority Pollutant List (40 CFR 401.15).

Occupational Safety and Health Act (OSHA): This product is considered to be a hazardous chemical under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Resource Conservation and Recovery Act (RCRA): This product is not considered to be a P or U listed hazardous waste under RCRA (40 CFR 261).

SARA Title III: Section 302 - Extremely Hazardous Substances (EHS): This product contains the following chemicals regulated under Section 302 (40 CFR 355) as extremely hazardous substances:

Chemical Name: ACRYLAMIDE
CASRN: 79-06-1
Percent in Composition:<0.1% by wt

SARA Title III: Section 304 - CERCLA: This product contains the following chemicals regulated under Section 304 (40 CFR 302) as hazardous substance(s) for emergency release notification ("CERCLA" List):

Chemical Name: ADIPIC ACID
CASRN: 124-04-9
Percent in Composition: <2 % by wt
Component RQ: 5000

Chemical Name: ACRYLAMIDE
CASRN: 79-06-1
Percent in Composition:<0.1 % by wt
Component RQ: 5000

SARA Title III: Section 311/312 - Hazard Communication Standard (HCS): This product is regulated under Section 311-312 (40 CFR 370). Acute health hazard.

SARA Title III: Section 313 Toxic Chemical List (TCL): This product does not contain any chemicals for routine annual toxic chemical release reporting under Section 313 (40 CFR 372).

TSCA Section 5(e) - Consent Order / SNUR: This product is not subject to a Section 5(e) Consent Order or Significant New Use Rule (SNUR).

TSCA Section 8(b) - Inventory Status: All chemical(s) comprising this product are either exempt or listed on the TSCA inventory.

TSCA Section 12(b) - Export Notification: This product does not contain any chemical(s) that are subject to a Section 12(b) export notification.

State Regulations:

California Proposition 65: The following is required composition information. This product contains the following chemical(s) which are currently listed on the California list of Known Carcinogens and Reproductive Toxins:

Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: ADIPIC ACID
CASRN: 124-04-9
Comment: Environmental Hazardous Substance

SECTION 16. OTHER INFORMATION

MSDS No:	14581
Reason Issued:	New format
Prepared By:	Leon Knight
Approved By:	
Supersedes Date:	05/23/01

Sections Modified: Database entry. Msds sections not effected.

Disclaimer: The following supercedes Buyer's documents. SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled or lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.

1958

DOW

Material Safety Data Sheet

The Dow Chemical Company
Midland, Michigan 48674
Emergency 517 · 636-4400

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

24-Hour Emergency Phone Number: 517-636-4400

Product: CRUDE BUTADIENE

Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

The Dow Chemical Company, Midland, MI 48674

Customer Information Center: 800-258-2436

2. COMPOSITION/INFORMATION ON INGREDIENTS

1,3-Butadiene	CAS# 000106-99-0	50.0-70.0%
Butene-1	CAS# 000106-98-9	5.0-25.0%
Isobutylene	CAS# 000115-11-7	5.0-25.0%
N-butane	CAS# 000106-97-8	5.0-15.0%
Isobutane	CAS# 000075-28-5	1.0-10.0%
Trans-butene-2 (E-form)	CAS# 000624-64-6	1.0-10.0%
Cis-butene-2 (Z-form)	CAS# 000590-18-1	1.0-10.0%
Vinyl acetylene	CAS# 000689-97-4	0.7- 1.2%
Propane	CAS# 000074-98-6	1.0- 2.0%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

****
* Color: Colorless. Appearance: Gas. Odor: Camphor-like. *
* DANGER: Extremely flammable liquid and vapor. Vapors may cause *
* flash fire. May be fatal if inhaled. *
* *
****

POTENTIAL HEALTH EFFECTS (See Section 11 for toxicological data.)

EYE: Vapors may irritate eyes. If liquid contacts eye, evaporation may cause frostbite-type injury due to rapid cooling.

SKIN: If liquid contacts skin, evaporation may cause

(Continued on page 2)

Product: CRUDE BUTADIENE
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frost-bite type injury due to rapid cooling. Skin absorption is unlikely due to physical properties.

INGESTION: Ingestion is unlikely due to physical state.

INHALATION: In confined or poorly ventilated areas, vapors can readily accumulated and can cause unconsciousness and death. Single exposure to 1,3-butadiene concentrations of approximately 2000 ppm and above may cause irritation to upper respiratory tract, anesthetic or narcotic effects, and even death.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Repeated excessive exposures may cause effect on liver, kidneys, respiratory tract, ovaries and testes. Excessive exposure may cause hemopoietic injury (damage to blood forming organs).

CANCER INFORMATION: This mixture contains component(s) which are listed as potential carcinogens for hazard communication purposes under OSHA Standard 29 CFR 1910.1200. The component is 1,3-butadiene, listed by IARC and NTP. 1,3-butadiene has been shown to cause cancer in laboratory animals. Butadiene epidemiology studies have linked employment in two different chemical operations each with a different type of cancer. The causative factors for these excess cancers have not been determined. Contains minor component(s) which have been shown to cause cancer in some laboratory animals. The component(s) is/are isobutylene.

TERATOLOGY (BIRTH DEFECTS): 1,3-butadiene has caused birth defects in laboratory animals but only at maternally toxic levels. 1,3-Butadiene has been toxic to the fetus in laboratory animals at doses nontoxic to the mother.

REPRODUCTIVE EFFECTS: 1,3-butadiene has been shown to cause injury to reproductive organs in mice although effects on reproduction have not been studied.

4. FIRST AID

EYE: Flush eyes with plenty of water.

SKIN: Wash off in flowing water or shower.

(Continued on page 3)

Product: CRUDE BUTADIENE
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Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

INGESTION: No adverse effects anticipated by this route of exposure.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. Repeated excessive exposure may aggravate preexisting liver disease.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES
FLASH POINT: Flammable gas.
METHOD USED: Not applicable.
AUTOIGNITION TEMPERATURE:

FLAMMABILITY LIMITS: Based on butadiene, will vary with composition.
LFL: 2.0% Vol.*
UFL: 12.0% Vol.*
* Based on butadiene, will vary with composition.

HAZARDOUS COMBUSTION PRODUCTS: During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include and are not limited to: carbon monoxide, carbon dioxide.

OTHER FLAMMABILITY INFORMATION: Container may vent and/or rupture due to fire. Container may rupture from polymerization. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur.

EXTINGUISHING MEDIA: Do not extinguish. Once fuel flow has stopped, small fires may be exginguished with water fog or fine spray, carbon dioxide, dry chemical, foam. Stop flow of fuel and allow fire to burn out.

(Continued on page 4)

Product: CRUDE BUTADIENE
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FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Fight fire from protective location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out and danger of reignition has passed. Immediately withdraw all personnel from area in case of rising sound from venting safety device or discoloration of the container. Stop flow of fuel and allow fire to burn out. Do not extinguish. If flames are accidentally extinguished explosive reignition may occur. Eliminate ignition sources. For unignited vapour cloud, use water spray to knock down and control dispersion of vapors. Stay upwind. Keep out of low areas where gases (fumes) can accumulate.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive pressure, self-contained breathing apparatus (SCBA) and protective fire-fighting clothing (includes fire-fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES (See Section 15 for Regulatory Information)

PROTECT PEOPLE: Keep unnecessary people away. See MSDS Section 10 for information on stability and reactivity.

PROTECT THE ENVIRONMENT: For large spills, warn public of downwind explosion hazard. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Check area with explosion meter before reentering area. Ground and bond all containers and handling equipment.

CLEANUP: In case of large spills, warn public of downwind explosion hazard. Remove all possible ignition sources; like cigarettes, flames, pilot lights, electrical sources, etc. Check area with approved explosion meter before re-entering area. Ground and bond all containers and handling equipment. Move unprotected personnel cross-wind to a clear area. Autorefrigeration potential. With large spills of this material drains may become plugged and valves may become inoperable

(Continued on page 5)

Product: CRUDE BUTADIENE
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because of the formation of ice due to expanding vapours or vapourizing liquids. Contact of the spilled liquid with water may result in explosions.

7. HANDLING AND STORAGE

HANDLING: Flammable gas. Containers should be bonded and grounded during transfer. Never use air pressure for transferring product.

STORAGE: See Reactivity & Stability, Section 10, of the MSDS. Use and handling areas should be 'no smoking' areas. Exclude oxygen from vapor space, small amounts of inhibitor are required.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Lethal concentrations may exist in areas with poor ventilation.

PERSONAL PROTECTIVE EQUIPMENT

EYE PROTECTION: Use safety glasses. Where contact with this material is likely, chemical goggles are recommended. If vapor exposure causes eye discomfort, use a full-face respirator. Evaporation of liquid may cause frostbite.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Evaporation of liquid may cause frostbite. For prolonged or frequently repeated contact could occur use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron or full-body suit will depend on operation.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure, self-contained breathing apparatus or

(Continued on page 6)

Product: CRUDE BUTADIENE
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positive-pressure airline with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved positive-pressure supplied-air respirator.

EXPOSURE GUIDELINE(S): Butadiene: ACGIH TLV is 2 ppm, A2. OSHA PEL is 1 ppm TWA, 5 ppm STEL.

Propane: OSHA PEL is 1000 ppm.

Butane: ACGIH TLV and OSHA PEL are 800 ppm.

Isobutane: ACGIH TLV and OSHA PEL for butane (n-butane, isobutane) are 800 ppm.

None established for other components.

PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless gas.
ODOR: Camphor-like.
VAPOR PRESSURE: 33-37 psia @ 68F
VAPOR DENSITY: 1.92-2 @ 60F
BOILING POINT: 22-33F
SOLUBILITY IN WATER/MISCIBILITY: Insoluble.
SPECIFIC GRAVITY/DENSITY: 0.58-0.62 at saturation pressure.

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Butadiene dimerizes readily. Stable under recommended storage conditions. See Storage, Section 7.

CONDITIONS TO AVOID: Butadiene reacts with air, forming peroxides, which accelerates popcorn type polymer formation. Popcorn formation might lead to line burst. See Hazardous Polymerization, Section 10. Active ingredient decomposes at elevated temperatures. Flammable vapors can be released at elevated temperatures. Avoid static discharge. Avoid contact with air to prevent formation of explosive peroxides.

(Continued on page 7)

Product: CRUDE BUTADIENE
Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

INCOMPATIBILITY WITH OTHER MATERIALS: Metal oxides and air will catalyze polymerization. See Hazardous Polymerization, Section 10. Avoid unintended contact with peroxides.

HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

HAZARDOUS POLYMERIZATION: Can occur. Elevated temperatures can cause hazardous polymerization. Polymerization can be catalyzed by air, high temperature, metal oxides. Monomer vapors can polymeriize and plug relief devices. Maintain inhibitor level.

11. TOXICOLOGICAL INFORMATION (See Section 3 for Potential Health Effects. For detailed toxicological data, write or call the address or non-emergency number shown in Section 1)

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): 1,3-butadiene has been shown to have mutagenic activity in bacteria and in certain animal tests.

12. ECOLOGICAL INFORMATION (For detailed Ecological data, write or call the address or non-emergency number shown in Section 1)

MOVEMENT & PARTITIONING: Based largely or completely on data for major component(s). Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3).

DEGRADATION & PERSISTENCE: Based on information for butadiene: Degradation is expected in the atmospheric environment within minutes to hours. Based on information for butane and isobutane: Degradation is expected in the atmospheric environment within days to weeks. No relevant information found for remaining component(s).

ECOTOXICITY: Based on information for butadiene: Material is slightly toxic to fish on an acute basis (LC50 between 10 and 100 mg/L). No relevant information found for remaining component(s).

13. DISPOSAL CONSIDERATIONS (See Section 15 for Regulatory Information)

(Continued on page 8)

Product: CRUDE BUTADIENE
Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. THE DOW CHEMICAL COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information On Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Center at 800-258-2436 or 517-832-1556 for further details.

14. TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.):
For D.O.T. regulatory information, if required, consult transportation regulations, product shipping papers contact your Dow representative.

CANADIAN TDG INFORMATION:
For TDG regulatory information, if required, consult transportation regulations, product shipping papers or contact your Dow representative.

15. REGULATORY INFORMATION (Not meant to be all-inclusive--selected regulations represented)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied is given. Regulatory requirements are subject to change and may differ from one location to another;

(Continued on page 9)

Product: CRUDE BUTADIENE
Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

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it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER	CONCENTRATION
1,3-BUTADIENE	000106-99-0	50 -70 %

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

CALIFORNIA PROPOSITION 65: The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986:

WARNING:
This product contains a chemical(s) known to the State of California to cause cancer.

(Continued on page 10)

Product: CRUDE BUTADIENE
Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

REGULATORY INFORMATION (CONTINUED)

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
PROPANE	000074-98-6	NJ2 PA1 NJ1
ISOBUTANE	000075-28-5	NJ1 NJ3 PA1
BUTANE	000106-97-8	NJ1 NJ3 PA1
1-BUTENE	000106-98-9	NJ3 PA1 NJ1
1,3-BUTADIENE	000106-99-0	NJ2 NJ3 PA1 PA2 NJ1 PA3
ISOBUTYLENE	000115-11-7	NJ1 NJ3 PA1
2-BUTENE, (Z)-	000590-18-1	PA1
2-BUTENE, (E)-	000624-64-6	PA1
1-BUTEN-3-YNE	000689-97-4	PA1

NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%).
NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).
PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).
PA2=Pennsylvania Special Hazardous Substance (present at greater than or equal to 0.01%).
PA3=Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

OSHA HAZARD COMMUNICATION STANDARD:

(Continued on page 11)

Product: CRUDE BUTADIENE
Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

REGULATORY INFORMATION (CONTINUED)

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):

This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:
Category:

Chemical Name	CAS#	RQ	% in Product
1,3-Butadiene	000106-99-0	10 lbs	50-70

CANADIAN REGULATOINS

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

A - compressed gas
B1 - flammable gas
D2A - possible, probable or known human carcinogen according to classifications by IARC or ACGIH

Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

- - - - -

CPR STATEMENT: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

- - - - -

HAZARDOUS PRODUCTS ACT INFORMATION: This product contains the following ingredients which are Controlled Products and/or on the Ingredient Disclosure List (Canadian HPA section 13 and 14):

COMPONENTS:	CAS #	AMOUNT (%w/w)
Butadiene	CAS #000106-99-0	50-70%

(Continued on page 12)

Product: CRUDE BUTADIENE
Product Code: 12849

Effective Date: 12/28/98 Date Printed: 01/05/00 MSD: 002208

REGULATORY INFORMATION (CONTINUED)

16. OTHER INFORMATION

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:

Health	2
Flammability	4
Reactivity	2

PRODUCT USE: Industrial raw material.

MSDS STATUS: Revised Section 13, Disposal.

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*BDECRUDE CRUDE BUTADIENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

BDECRUDE CRUDE BUTADIENE

Chemical Name and/or Family or Description:

Olefin

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC X NTP X OTHER X NONE

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Butadiene, 1,3-	106-99-0	2 ppm TWA-ACGIH-(A2) 1 ppm TWA-OSHA (Subject to 29 CFR 1910.1051) 5 ppm STEL-OSHA	50.00-64.99
Isobutylene	115-11-7		10.00-19.99
Butylene	106-98-9		10.00-19.99
Isobutane	75-28-5		10.00-19.99
Trans-2-butene	624-64-6		3.00-9.99
Butane,normal	106-97-8	800 ppm TWA-ACGIH 800 ppm TWA-OSHA	3.00-9.99
Cis-2-butene	590-18-1		3.00-9.99
Vinyl acetylene	689-97-4		1.00-2.99

MSDS CODE AND NAME	: *BDECRUDE*	*CRUDE BUTADIENE*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

Odor:

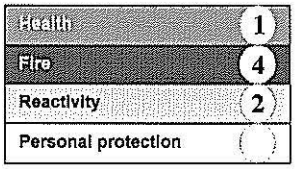
Camphor odor

WARNING STATEMENT

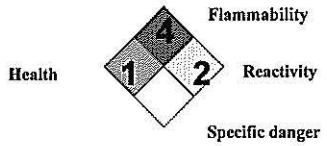
DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
MAY FORM EXPLOSIVE PEROXIDES ON EXPOSURE TO AIR
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT
CONTAINS 1,3-BUTADIENE - CANCER HAZARD

ATTENTION !

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may cause irritation of the nose and throat, headache, nausea, and drowsiness. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

An epidemiology study conducted at the former Texaco Chemical Company 1,3-butadiene manufacturing facility (subsequently acquired by the Huntsman Corporation) and updated through 1990 showed that the workers had a lower overall death rate than the general U.S. population. There was a two-fold increase in mortality from lymphosarcoma and reticulum cell sarcoma. However, the increase was not consistently seen in all job groups potentially exposed to higher levels of 1,3-butadiene. In addition, the increase was seen primarily in short term workers whose employment began during World War II and not in those employed ten years or more.

This pattern of results suggests that exposure to 1,3-butadiene was not responsible for the increase lymphosarcomas. This study has now been updated through 1994. Preliminary findings from this most recent update indicate that the overall death rate, and the death rate due to cancer among employees who worked at the plant from 1942 to 1994 continue to be lower than expected. A slight increase in the number of deaths from cancers of other lymphatic tissues among long term employees was observed. These deaths involved employees hired prior to 1950. Numerous control measures have been incorporated into the facility since that time, thereby significantly reducing workplace exposures. A thorough review of these findings is currently underway.

Several other studies involving workers manufacturing styrene-butadiene rubber have shown increases of leukemia and lymphomas. These workers were potentially exposed to 1,3-butadiene and other chemicals, especially styrene and possibly benzene. Due to the presence of multiple chemicals and inconsistent results, these studies do not demonstrate 1,3-butadiene exposure to be responsible for increased leukemia or lymphoma in these workers.

Additional information concerning 1,3-butadiene toxicity in experimental animals is located in Section 11 (Toxicological Information).

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

OSHA has defined 1,3-butadiene as a cancer hazard.

The current International Agency for Research on Cancer (IARC) classification of 1,3-butadiene is class 2A, meaning that IARC finds that there is limited evidence of 1,3-butadiene carcinogenicity in humans, and sufficient evidence of 1,3-butadiene carcinogenicity in experimental animals.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Overexposure to this material may sensitize the heart to catecholamine- induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information. This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

MSDS CODE AND NAME	: *BDECRUDE*	*CRUDE BUTADIENE*
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COMPANY	: *HUNTSMAN*	

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

426.7 (800 F)

Flash Point (degrees C):

Not applicable.

Flammable Limits % (Lower-Upper):

Lower: 1.6
Upper: 12

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Extremely flammable. Flashback may occur along vapor trail. May form explosive peroxides on exposure to air. Containers may explode in fire.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all sources of ignition. Ventilate area of spill or leak. Stop flow of liquid at source if possible. Prevent liquid from entering sewers. Dilute with water fog. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Avoid contact with eyes, skin, and clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Do not contact with copper or copper alloys as explosive copper compounds may be formed.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition. Protect containers against static electricity, lightning, and physical damage. Must be kept inhibited during storage and shipment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown. Please refer to the OSHA standard for 1,3-butadiene (29 CFR 1910.1051) for specific respiratory protection information for exposures to 1,3-butadiene.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Camphor odor

Boiling Point (degrees C):

-5.5 - .5 (22 - 33 F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

.6

pH:

Not applicable.

Vapor Pressure:

1800 mmHg at 20 C (68 F)

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

1.9 - 2

Solubility in Water (%):

< .1

Other:

None

MSDS CODE AND NAME	: *BDECRUDE*	*CRUDE BUTADIENE*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others** X **None of these**

Comments:

This material may also react with reducing agents, copper, and copper alloys.

Products Evolved When Subjected to Heat or Combustion:

Carbon monoxide and carbon dioxide may be formed on burning in a limited air supply. May spontaneously dimerize to 4-vinyl-1-cyclohexene in a temperature-dependent reaction. Vapors may form polymers which block vents or flame arrestors.

Hazardous Polymerizations:

OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
LD50 Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be > 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

See "Other Information", Section 16 for Toxicological Data regarding 1,3-butadiene.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class:
2.1

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DATE ISSUED	: *7/1/2004*	
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COMPANY	: *HUNTSMAN*	

Identification Number:
UN 1075

Packing Group:

Label Required:
Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:

Label Required:
Not determined.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** X **Pressure** X **Reactive** X **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Butadiene, 1,3-	106-99-0	50.00-64.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Butadiene, 1,3-	106-99-0	50.00-64.99	10

States Right-to-Know Regulations:

Chemical Name	State Right-to-know

Butadiene, 1,3-	FL, IL, MA, NJ, PA, RI, MI
Butane,normal	IL, MA, NJ, PA, RI
Butylene	FL, MA, NJ, PA
Isobutylene	FL, MA, NJ, PA
Cis-2-butene	FL, MA, NJ, PA
Trans-2-butene	FL, MA, NJ, PA
Vinyl acetylene	FL, MA, NJ, PA
Propane	IL, MA, NJ, PA, RI
1-propyne	FL, IL, MA, NJ, PA, RI
Isobutane	MA, NJ, PA

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Butadiene, 1,3-	106-99-0

INTERNATIONAL REGULATIONS:

Export Notification (TSCA-12b):
This product may be subject to export notification under TSCA section 12(b); contains: 4-vinylcyclohexene

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Not determined

Canadian Inventory Status:
Not determined

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
Not determined

Japan Inventory Status:
Not determined

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:
Not determined.

Mobility:
Not determined.

Persistence and Biodegradability:
Not determined.

Potential to Bioaccumulate:
Not determined.

Remarks:
None

MSDS CODE AND NAME	: *BDECRUDE*	*CRUDE BUTADIENE*
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COMPANY	: *HUNTSMAN*	

16. OTHER INFORMATION 7/1/2004

Please note that this product, or a component of this product, contains 1,3-butadiene. The U.S. Occupational and Health Administration (OSHA) has recently issued a new workplace exposure standard for 1,3-butadiene (29 CFR 1910.1051).

This standard, published in the November 4, 1996 issue of the Federal Register (61 FR 56746), contains significant scientific information in the preamble, and the specific elements for compliance to this standard. The effective date of this standard is February 3, 1997, although some sections become effective on other dates. As a purchaser and user of products containing 1,3-butadiene, it is strongly recommended that you review and understand this standard and determine its applicability to your workplace.

Prolonged and repeated inhalation of 1,3-butadiene has produced tumors in multiple sites in rats and mice. In Sprague-Dawley rats exposed to 1000 or 8000 ppm butadiene, tumor sites have included the mammary gland, thyroid, and testes. The National Toxicology Program concluded there was "clear evidence" of carcinogenicity in B6C3F1 mice exposed to 6.25 ppm to 1250 ppm butadiene. This was based on increased tumors in the hematopoietic system, heart, lung, forestomach, liver and harderian gland in males and females, preputial gland, brain, and kidney (males), and in ovary and mammary gland (females). IARC has concluded that there is sufficient evidence for 1,3-butadiene carcinogenicity in experimental animals. Repeated exposure to 1,3-butadiene has produced genetic toxicity, bone marrow toxicity, and anemia in the mouse. Noncarcinogenic damage to the ovary, testes, liver, nasal tissue, and forestomach have also been observed in the mouse, and evidence of kidney damage has been observed in the rat. Exposure of pregnant rodents to maternally toxic 1,3-butadiene concentrations has affected the developing fetus. Malformations (birth defects) have been reported in the developing fetus of pregnant rats exposed to 8000 ppm 1,3-butadiene. There was no evidence of teratogenic effects in a second developmental study in the rat or a developmental study in the mouse, both involving butadiene exposures up to 1000 ppm.

The B6C3F1 mouse has been demonstrated to be substantially more susceptible to toxic and carcinogenic responses to 1,3-butadiene exposure than the Sprague-Dawley rat. Repeated exposure to 6.25 ppm 1,3-butadiene has produced lung tumors and ovarian atrophy in females, and evidence of genetic toxicity in males and females of this mouse strain. By contrast, evidence for toxic and carcinogenic responses in the rat is more limited and has been observed primarily following prolonged exposure to 1,3-butadiene concentrations of 1000 ppm or higher.

In an effort to explain the higher toxic and carcinogenic potency of 1,3-butadiene in the mouse and evaluate the relevance of these animal bioassay results to humans, pharmacokinetic and metabolism studies have been conducted using rodents, monkeys, and tissues from rodents and humans. The results of these studies suggest that the mouse may not be an appropriate model from which to predict human health effects from exposure to 1,3-butadiene.

See Section 3 (Hazard Identification) for additional health effects information for 1,3-butadiene.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

MSDS CODE AND NAME	: *BDECRUDE*	*CRUDE BUTADIENE*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*MEOHCR CRUDE METHANOL*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

MEOHCR CRUDE METHANOL

Chemical Name and/or Family or Description:

Byproduct alcohol

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Methyl alcohol (methanol)	67-56-1	200 ppm TWA-OSHA (SKIN) 250 ppm STEL-ACGIH 250 ppm STEL-OSHA 200 ppm TWA-ACGIH (SKIN)	95.00-99.99

MSDS CODE AND NAME	: *MEOHCR*	*CRUDE METHANOL*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: **HUNTSMAN**	

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

Odor:

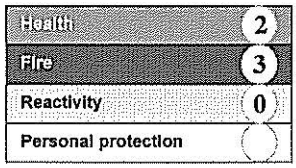
Faint alcohol odor

WARNING STATEMENT

WARNING ! FLAMMABLE LIQUID AND VAPOR
HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN
MAY CAUSE DIZZINESS AND DROWSINESS

ATTENTION ! CONTAINS METHANOL, WHICH MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED,
CAN BE RAPIDLY ABSORBED THROUGH THE SKIN, AND CAN CAUSE NERVE DAMAGE
MAY CAUSE EYE IRRITATION
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
CAN CAUSE LIVER, KIDNEY, AND HEART DAMAGE

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Vapor may cause irritation, experienced as discomfort, with excess tear production and blinking, and seen as excess redness of the eye. Liquid may cause more severe irritation and possible corneal injury.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. In addition to the potential skin irritation effects noted above, skin contact may result in other adverse health effects. Prolonged, widespread, or repeated skin contact may result in the absorption of potentially harmful amounts of material.

Inhalation: Vapors or mist may cause irritation of the nose and throat. Inhalation may result in the absorption of potentially harmful amounts of material. Inhalation may also cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Severe overexposure may result in coma. Extreme overexposure may result in death.

Ingestion: Contains methanol which is toxic if swallowed. Causes abdominal discomfort or pain, nausea, vomiting, difficulty breathing, headache, weakness, loss of coordination, difficulty walking, difficulty seeing, dizziness, drowsiness, unconsciousness, and coma. Visual effects include blurred vision, double vision, tunnel vision, changes in color perception, and blindness. Symptoms may be delayed. Severe poisoning may cause liver, kidney, and heart muscle damage and/or death. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

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Sensitization Properties: Unknown

Chronic:

Prolonged and repeated overexposure to methanol by skin contact, ingestion, or inhalation may produce chronic poisoning, with nausea, vomiting, headache, ringing in the ears, difficulty walking, dizziness, impaired vision, and liver and kidney damage. In severe chronic overexposure cases, permanent eye damage or blindness may occur.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate cardiovascular, liver, and kidney disease. Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition). Repeated overexposure may aggravate or enhance existing nervous system dysfunction.

Other Remarks:

This product contains methanol. Methanol poisoning can occur via the lungs, skin, or by ingestion.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing (See Other Instructions). Destroy non-resistant footwear. Get medical attention if skin irritation persists or contact has been prolonged.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information. Administration of ethyl alcohol is antidotal for methanol. Immediate treatment may reduce toxic effects, supplemented, if necessary, with hemodialysis. Contact a Poison Center for further treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

385 (725 F)

Flash Point (degrees C):

11.1 (52 F) (TCC)

Flammable Limits % (Lower-Upper):

Lower: 6
Upper: 36

Recommended Fire Extinguishing Agents And Special Procedures:

Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, alcohol resistant foam or carbon dioxide to extinguish fire.

Unusual or Explosive Hazards:

Danger! Flammable materials may release vapors that travel long distances, ignite and flash back. Containers may explode in a fire. Do not exposeto heat, sparks, flame, or other sources of ignition.

Use alcohol-compatible foam. Flame is invisible in daylight.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles should be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Methanol: OSHA PEL-TWA 200 ppm; STEL 250 ppm. (SKIN notation) ACGIH TLV-TWA 200 ppm; STEL 250 ppm. (SKIN notation)

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COMPANY	: HUNTSMAN	

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Faint alcohol odor

Boiling Point (degrees C):

64.4 (148 F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

.792

pH:

Not applicable.

Vapor Pressure:

97 ppm at 20 C (68 F)

Viscosity:

.7 cSt at 20 C (68 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

1.1

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others** X **None of these**

Comments:

This material reacts violently with chromic anhydride, lead perchlorate, perchloric acids, other strong acids and strong oxidizers, and strong bases. This material is corrosive to lead and aluminum.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

MSDS CODE AND NAME	: *MEOHCR*	*CRUDE METHANOL*
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COMPANY	: HUNTSMAN	

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Animal data does not reflect human toxicity; see Sections 3 & 11
Inhalation:
Believed to be moderately toxic
Dermal:
Animal data does not reflect human toxicity; see Sections 3 & 11

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be > 25.00 - 50.00 /110 (rabbit) moderately irritating
Sensitization:
Not determined.

Other:

Methanol, a component of this product, has been shown to cause embryo/fetal toxicity and birth defects in rats, but only at doses which cause maternal toxicity (i.e., illness in the mother).

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristic of ignitability, and is also identified under RCRA as methanol. If discarded in its present form it would have the hazardous waste numbers D001 and U154. Under RCRA, it is the responsibility of the user of the product to determine, at time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to, ignitable and methanol.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Methanol

Hazard Class:
3

Identification Number:
UN 1230

Packing Group:
II

Label Required:
Flammable

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:

MSDS CODE AND NAME	:	*MEOHCR CRUDE METHANOL*
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DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Methanol

Hazard Class:
3.2/6.1

Identification Number:
UN 1230 (P.G. II)

Label Required:
Flammable liquids, Poison

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** X **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Methyl alcohol (methanol)	67-56-1	95.00-99.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Methyl alcohol (methanol)	67-56-1	95.00-99.99	5000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Methyl alcohol (methanol)	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

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COMPANY	: HUNTSMAN	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 1, Subdiv A: Very toxic Class D, Div 2, Subdiv B: Irritant Class B, Div 2: Flammable liquid

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
Not determined

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 1000.00 ppm relatively harmless

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

"SKIN" notation in Section 2 indicates possible adverse health effects as a result of absorption through the skin, mucous membranes and eyes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Date Issued: 7/1/2004.

MSDS CODE AND NAME	: *MEOHCR*	*CRUDE METHANOL*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	**:**	***CYCLOHEX CYCLOHEXANE***
DATE ISSUED	**:**	**7/1/2004**
DATE PRINTED	**:**	**7/1/2004**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

CYCLOHEX CYCLOHEXANE

Chemical Name and/or Family or Description:

Alicyclic Hydrocarbon

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Cyclohexane	110-82-7	300 ppm TWA-OSHA 300 ppm TWA-ACGIH	100

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COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

Odor:

Bland odor

WARNING STATEMENT

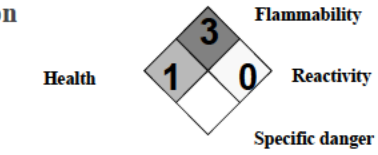
DANGER !

EXTREMELY FLAMMABLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MAY CAUSE LIVER AND KIDNEY DAMAGE BASED ON ANIMAL DATA
MAY CAUSE DIZZINESS AND DROWSINESS
MAY CAUSE RESPIRATORY TRACT IRRITATION
ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE

Hazardous Material Information System (United States)

Health	1
Fire	3
Reactivity	0
Personal protection	

National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: May cause minimal irritation, experienced as temporary discomfort.

Skin: Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur. Aspiration may occur during swallowing or vomiting resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing (See Other Instructions). Destroy non-resistant footwear. Get medical attention if skin irritation persists or contact has been prolonged.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

245 (473 F)

Flash Point (degrees C):

-20 (-4 F) (TCC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 8.4

Recommended Fire Extinguishing Agents And Special Procedures:

Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, foam or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers. Explosive air-vapor mixtures may form.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

MSDS CODE AND NAME	**:**	***CYCLOHEX CYCLOHEXANE***
DATE ISSUED	**:**	**7/1/2004**
DATE PRINTED	**:**	**7/1/2004**
COMPANY	**:**	**HUNTSMAN**

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Cyclohexane: OSHA PEL-TWA 300 ppm; ACGIH TLV-TWA 300 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Bland odor

Boiling Point (degrees C):

81.7 (179 F)

Melting/Freezing Point (degrees C):

6.1 (43 F)

Specific Gravity (water=1):

.78

pH:

Not applicable.

Vapor Pressure:

104 mmHg at 20 C (68 F)

Viscosity:

1.3 cSt at 16.7 C (62 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

2.9

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 5.50 - 6.00 g/kg (rat) practically non-toxic
Inhalation:
Believed to be practically non-toxic
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

This product, or a component of this product, has caused liver and kidney damage in laboratory animals.

MSDS CODE AND NAME	**:**	***CYCLOHEX CYCLOHEXANE***
DATE ISSUED	**:**	**7/1/2004**
DATE PRINTED	**:**	**7/1/2004**
COMPANY	**:**	**HUNTSMAN**

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristic of ignitability, and is also identified under RCRA as cyclohexane. If discarded in its present form it would have the hazardous waste numbers D001 and U056. Under RCRA, it is the responsibility of the user of the product to determine, at time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to, ignitable and cyclohexane.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Cyclohexane

Hazard Class:
3

Identification Number:
UN 1145

Packing Group:
II

Label Required:
Flammable liquid

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Cyclohexane

Hazard Class:
3.1/9.2

Identification Number:
UN 1145

Label Required:
Flammable liquid

MSDS CODE AND NAME	:	***CYCLOHEX CYCLOHEXANE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute X **Chronic** X **Fire** X **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Cyclohexane	110-82-7	100

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Cyclohexane	110-82-7	100	1000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Cyclohexane	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

Export Notification (TSCA-12b): This product may be subject to export notification under TSCA section 12(b); contains: Cyclohexane

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class B, Div 2: Flammable liquid

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	**:**	***CYCLOHEX CYCLOHEXANE***
DATE ISSUED	**:**	**7/1/2004**
DATE PRINTED	**:**	**7/1/2004**
COMPANY	**:**	**HUNTSMAN**

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

None

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*DEA DIETHANOLAMINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

DEA DIETHANOLAMINE

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC____ NTP____ OTHER____ NONE__X__

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2'-iminobis- (Common name - Diethanolamine)	111-42-2	2 mg/m³ TWA-ACGIH (SKIN)	99.00-99.90

MSDS CODE AND NAME	:	*DEA DIETHANOLAMINE*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004
COMPANY	:	HUNTSMAN

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

White, crystalline solid at room temperature. Clear, colorless liquid above 82°F.

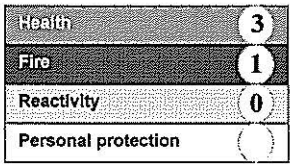
Odor:

Ammonia-like

WARNING STATEMENT

WARNING ! CAUSES EYE IRRITATION
MAY CAUSE SKIN IRRITATION
MAY CAUSE BLOOD EFFECTS, LIVER, AND KIDNEY DAMAGE - BASED ON ANIMAL DATA
DO NOT ADD NITRITES - MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as marked excess redness and swelling of the eye with injury to the cornea.

Skin: May cause irritation with discomfort, and seen as local redness and possible swelling. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Moderately toxic. May cause abdominal discomfort, nausea, vomiting, and diarrhea.

Sensitization Properties: Unknown

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis.

Medical Conditions Aggravated by Exposure:

Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition). Repeated overexposure may aggravate existing liver or kidney disease.

MSDS CODE AND NAME	:	*DEA DIETHANOLAMINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing and shoes. Get medical attention if skin irritation persists or skin contact has been prolonged.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

154.4 (310°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 1
Upper: 10

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

MSDS CODE AND NAME	:	*DEA DIETHANOLAMINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Eye wash should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates should be worn. Exposed workers should wash exposed skin several times daily with soap and water.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Diethanolamine: 2 mg/m³ (0.46 ppm) TWA-ACGIH; skin notation

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

White, crystalline solid at room temperature. Clear, colorless liquid above 82°F.

Odor:

Ammonia-like

Boiling Point (degrees C):

268.9 (516°F)

Melting/Freezing Point (degrees C):

27.8 (82°F)

Specific Gravity (water=1):

1.09

pH:

11.5 [Basic]

Vapor Pressure:

<0.01 mmHg at 20°C (68°F)

Viscosity:

321 cSt at 30°C (86°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

3.7

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat____ Strong Oxidizers____ Others__X__ None of these____

Comments:

This material reacts violently with acids. This material is incompatible with strong oxidizing agents. This material is corrosive to copper, zinc, aluminum and thier alloys. Do not add or formulate with nitrites. See Section 16, OTHER INFORMATION.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 1.41 g/kg (rat) moderately toxic
Inhalation:
Not determined.
Dermal:
LD50 >5.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 3.00 - 5.00 /8.0 (rabbit) moderately irritating
Eyes:
(Draize) Believed to be 50.00 - 80.00 /110 (rabbit) severely irritating
Sensitization:
Not determined.

Other:

Diethanolamine Carcinogenicity:
In a chronic (two year) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) Alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the

NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans.

Diethanolamine Developmental and Reproductive Toxicity:
Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Environmentally hazardous substances, liquid, n.o.s. (Diethanolamine)

Hazard Class:
9

Identification Number:
UN3082

Packing Group:
III

Label Required:
Class 9

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (diethanolamine)

Hazard Class
9

Identification Number
UN3082

Packing Group
III

Label Required

Class 9

ICAO

Proper Shipping Name:
Environmentally hazardous substances, liquid, n.o.s. (Diethanolamine)

Hazard Class
9

Identification Number
UN3082

Packing Group
III

Label Required
Class 9

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire____ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethanol, 2,2'-iminobis- (Common name - Diethanolamine)	111-42-2	99.00-99.90%

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethanol, 2,2'-iminobis- (Common name - Diethanolamine)	111-42-2	99.00-99.90	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2'-iminobis- (Common name - Diethanolamine)	CT, FL, IL, MA, NJ, PA, RI

MSDS CODE AND NAME	:	*DEA DIETHANOLAMINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

DEA is expected to have low toxicity to aquatic species.

Mobility:

DEA is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

DEA is readily biodegradable and is not expected to persist in the environment.

Potential to Bioaccumulate:

DEA is not expected to bioaccumulate (log K_{ow} = -1.43).

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.
A component of this product carries "SKIN" notation in Section 2 as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin, mucous membranes, and eyes, by contact with vapor, mist, spray, or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

MSDS CODE AND NAME	:	*DEA DIETHANOLAMINE*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004
COMPANY	:	HUNTSMAN

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*DEG DIETHYLENE GLYCOL*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

DEG DIETHYLENE GLYCOL

Chemical Name and/or Family or Description:

Glycol

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2'-oxybis (Common Name - Diethylene glycol)	111-46-6		100

REFER TO SECTION 16 OF THE MSDS FOR PROHIBITED PRODUCT APPLICATIONS.

MSDS CODE AND NAME	:	*DEG DIETHYLENE GLYCOL*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004
COMPANY	:	HUNTSMAN

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

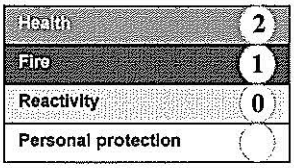
Odor:

Low odor

WARNING STATEMENT

WARNING !	CAN CAUSE LIVER AND KIDNEY DAMAGE IF SWALLOWED HARMFUL IF SWALLOWED ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE MAY CAUSE DIZZINESS AND DROWSINESS
Attention:	THIS PRODUCT IS NOT TO BE USED IN FOOD, DRUG, COSMETIC OR POTABLE WATER APPLICATIONS THIS PRODUCT IS NOT TO BE USED TO PRODUCE FOGS OR MISTS IN THEATRICAL, MUSICAL OR OTHER ENTERTAINMENT PERFORMANCES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes:	May cause minimal irritation, experienced as temporary discomfort.
Skin:	Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.
Inhalation:	Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Aspiration may occur during swallowing or vomiting, resulting in lung damage. Contains ethylene glycol and/or diethylene glycol, which are toxic when swallowed. A lethal dose for an adult is 1-2 ml per kilogram, or about 4 ounces (one-half cup). Symptoms include headache, weakness, confusion, dizziness, staggering, slurred speech, loss of coordination, faintness, nausea and vomiting, increased heart rate, decreased blood pressure, difficulty breathing and seeing, pulmonary edema, unconsciousness, convulsions, collapse, and coma. Symptoms may be delayed. Decreased urine output and kidney falure may also occur. Severe poisoning may cause death.

Sensitization Properties: Unknown

Chronic:

Repeated ingestion may cause liver and kidney damage.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Ethylene glycol (EG) and diethylene glycol (DEG) intoxication may initially produce behavioral changes, drowsiness, vomiting, diarrhea, thirst, and convulsions. EG and DEG are nephrotoxic. End stages of poisoning may include renal damage or failure with acidosis. Supportive measures, supplemented with hemodialysis if indicated, may limit the progression and severity of toxic effects.

FOR ETHYLENE GLYCOL POISONING intravenous ethanol is a recognized antidotal treatment ; other antidotal treatments also exist for EG poisoning. FOR DIETHYLENE GLYCOL POISONING the role of intravenous ethanol in the treatment is unclear but it may be of benefit in view of structural and toxicological similarities to ethylene glycol. Contact a Poison Center for further treatment information.

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

MSDS CODE AND NAME	:	*DEG DIETHYLENE GLYCOL*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004
COMPANY	:	HUNTSMAN

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

143.3°C (290 °F) (COC)

Flammable Limits % (Lower-Upper):

Lower: 1.6
Upper: 10.8

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

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Local exhaust ventilation recommended if generating vapor, dust, or mist. If exhaust ventilation is not available or inadequate, use MSHA or NIOSH approved respirator as appropriate.

Exposure Limit for the Total Product:

None established for product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Low odor

Boiling Point (degrees C):

245°C (473 °F)

Melting/Freezing Point (degrees C):

-11.1°C (12°F)

Specific Gravity (water=1):

1.12

pH:

7

Vapor Pressure:

Not determined.

Viscosity:

14 cSt at 40°C (104°F)

VOC Content:

9% by ASTM D 2369

Vapor Density (Air=1):

3.6

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

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11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Animal data does not reflect human toxicity; see Sections 3 & 11
Inhalation:
Not determined.
Dermal:
LD50 Believed to be 13.30 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

Continuous ingestion of a diet containing 2% or 4% diethylene glycol for two years produced liver and kidney damage, and bladder stones in rats. Bladder tumors, caused by repeated injury from bladder stones, were also produced.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated

Hazard Class:
Not regulated

Identification Number:
Not regulated.

Packing Group:
Not regulated

Label Required:
Not regulated

IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

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COMPANY	:	*HUNTSMAN*

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated

Identification Number:
Not regulated

Label Required:
Not regulated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2'-oxybis (Common Name - Diethylene glycol)	PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 2, Subdiv A: Material causing other toxic effects (VERY TOXIC)

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

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DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is >1000.00 ppm relatively harmless

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not evaluated.

Remarks:

Not evaluated.

16. OTHER INFORMATION 7/1/2004

Due to toxicity considerations with diethylene glycol, the following applications are considered to be prohibited applications: Potable Water Applications; Food, Drug and Cosmetic Formulations; Antifreeze for potable water systems in recreational vehicles and seasonal homes; Antifreeze for fire sprinkler systems.

This product is not to be used to produce fogs or mists in theatrical, musical or other entertainment performances.

Date Issued: 7/1/2004.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

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2502-

MATERIAL SAFETY DATA SHEET

MOTIVA MSDS: 00899MT 01/04/99

E/P MIX (ETHANE/PROPANE)

TELEPHONE NUMBER:
24 HOUR EMERGENCY ASSISTANCE
EQUIVA SERVICES: 877-276-7283
CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE
877-276-7285

NAME AND ADDRESS:
MOTIVA ENTERPRISES LLC
PRODUCT STEWARDSHIP
P.O. BOX 674414
HOUSTON, TX 77267-4414

LEGEND:
N.D. - NOT DETERMINED N.A. - NOT APPLICABLE N.T- NOT TESTED
< - LESS THAN > - GREATER THAN

1.NAME

MATERIAL IDENTITY
Product Code and Name:
00899 E/P MIX (ETHANE/PROPANE)
Chemical Name and/or Family or Description:
Aliphatic Hydrocarbon

---

2. COMPOSITION/INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION IS AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE A COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA	IARC	NTP	OTHER	NONE
X	X	X	X	
-	-	-	-	-

Composition: (Sequence Number and Chemical Name)

Seq.	Chemical Name	CAS Number	Range in %
01	* Propane	74-98-6	20.00-34.99
02	* Ethane	74-84-0	20.00-34.99
03	* Iso-heptane	591-76-4	10.00-19.99
04	* Butane,normal	106-97-8	10.00-19.99
05	* Isobutane	75-28-5	3.00-9.99
06	* Iso-pentane	78-78-4	3.00-9.99
07	* N-pentane	109-66-0	3.00-9.99
08	* Iso-hexane	107-83-5	3.00-9.99
09	* N-hexane	110-54-3	3.00-9.99
10	* Benzene	71-43-2	0.10-0.99

PRODUCT IS HAZARDOUS ACCORDING TO OSHA (1910.1200).
* COMPONENT IS HAZARDOUS ACCORDING TO OSHA.

Exposure Limits referenced by Sequence Number in the Composition Section

Seq.	Limit	
01	1000	ppm TWA-OSHA
01	-	- ASPHYXIANT (ACGIH)
02	-	- ASPHYXIANT (ACGIH)
03	400	ppm TWA-ACGIH
03	500	ppm STEL-ACGIH
04	800	ppm TWA-OSHA
04	800	ppm TWA-ACGIH
06	600	ppm TWA-ACGIH
07	600	ppm TWA-OSHA
07	750	ppm STEL-OSHA
07	600	ppm TWA-ACGIH
07	750	ppm STEL-ACGIH
08	500	ppm TWA-OSHA
08	1000	ppm STEL-OSHA
08	500	ppm TWA-ACGIH
08	1000	ppm STEL-ACGIH
09	50	ppm TWA-OSHA
09	50	ppm TWA-ACGIH
10	1	ppm TWA-OSHA (SUBJECT TO 29 CFR 1910.1028)
10	5	ppm STEL-OSHA
10	0.5	ppm TWA-ACGIH (SKIN) (A1)
10	2.5	ppm STEL-ACGIH

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW
Appearance:
Colorless gas or liquid
Odor:
Odorless

WARNING STATEMENT

DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE EYE IRRITATION

ATTENTION ! CONTAINS N-HEXANE WHICH CAN CAUSE NERVOUS SYSTEM DAMAGE
CONTAINS BENZENE - CANCER HAZARD

HMIS			NFPA	
Health:	1	Reactivity: 0	Health:	1 Reactivity: 0
Flammability:	4	Special : -	Flammability:	4 Special : -

POTENTIAL HEALTH EFFECTS

	EYE	SKIN	INHALATION	INGESTION
Primary Route of Exposure:	X	X	X	

EFFECTS OF OVEREXPOSURE
Acute:
Eyes:
May cause irritation, experienced as mild discomfort and seen as slight

excess redness of the eye.

Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin:
Brief contact is not irritating.

Product is a gas - not expected to be absorbed through the skin.

Skin contact with liquid product can cause frostbite (cold burns).

Inhalation:
Gas may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion:
Product is a gas - not expected to cause toxic effects due to ingestion.

This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties:
Unknown.

Chronic:
Prolonged and repeated overexposure to n-hexane may cause fatigue, loss of appetite and weight loss. Gradual numbness and weakness of the hands and feet may occur, accompanied by a tingling sensation. In severe chronic overexposure cases, loss of muscle coordination may occur in the hands and feet.

Medical Conditions Aggravated by Exposure:
Repeated overexposure may aggravate or enhance existing nervous system dysfunction.

Other Remarks:
This product contains benzene. Prolonged and repeated exposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans.

4. FIRST AID MEASURES

Eyes:
Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:
Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin.

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention.

Ingestion:
No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:
If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:
Overexposure to this material may sensitize the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information.

This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees F):
959
Flash Point (degrees F):
-211
Flammable Limits (%):
Lower: 2.9
Upper: 13

Recommended Fire Extinguishing Agents And Special Procedures:
Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:
Explosive air-vapor mixtures may form.

Danger! Readily forms explosive air-vapor mixtures; may release explosive vapors that travel, be ignited at remote locations, and flash back. Containers may explode in fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Extinguishing Media Which Must Not Be Used:
Not determined.

Special Protective Equipment for Firefighters:
Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

If more than 1,315 pounds of product is spilled, then report spill according to SARA 304 and/or CERCLA 102(a) requirements, unless product qualifies for the petroleum exemption (CERCLA Section 101(14)).

7. HANDLING AND STORAGE

Precautions to be Taken in Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas or liquid

Odor:

Odorless

Boiling Point (degrees F):
-127

Melting/Freezing point (degrees F):
Not applicable.

Specific Gravity (water=1):
.5489

pH of undiluted product:
Not applicable.

Vapor Pressure:
< 800 mmHg

Viscosity:
Not applicable.

VOC Content:
Not determined.

Vapor Density (air=1):
> 1

Solubility in Water (%):
.1 - 1

Other: None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:
(If Others is checked below, see comments for details)

Air	Water	Heat	Strong Oxidizers	Others	None of These
_	_	_	X	_	_

Comments:
None

Products Evolved When Subjected to Heat or Combustion:
Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations: DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION(ANIMAL TOXICITY DATA)
Median Lethal Dose
Oral:
Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
Not applicable; material is a gas.
Irritation Index, Estimation of Irritation (Species)
Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be > 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:
Studies with laboratory animals suggest that prolonged and repeated over-exposure to n-hexane vapors may cause injury to testes and peripheral nervous system.

Prolonged and repeated exposure to benzene has caused anemia, lymphoma, and other cancers, in laboratory animals. Benzene has been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (i.e., illness in the mother).

12. DISPOSAL CONSIDERATIONS

Waste Disposal Methods
This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001 respectively. Under RCRA , it is the responsibility of the user of the product to determine , at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitabilty.

Remarks
Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation
DOT:
Proper Shipping Name:
Hydrocarbon gas, compressed, N.O.S
Hazard Class:
2.1
Identification Number: UN 1964
Packing Group:
Label Required:
Flammable gas

This product contains a DOT Hazardous Substance or Substances, listed in Section 14 of the MSDS. If the product's shipping container holds at least 1,315 lbs, then the DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9, unless the product qualifies for the petroleum exemption (49 CFR 171.8).

IMDG:
Proper Shipping Name:
Not evaluated

ICAO:
Proper Shipping Name:
Not evaluated

TDG:
Proper Shipping Name:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:
Section 302/304 Extremely Hazardous Substances

Seq.	Chemical Name	CAS Number	Range in %
None			

Section 302/304 Extremely Hazardous Substances (CONT)

Seq.	TPQ	RQ
None		

Section 311 Hazardous Categorization:

Acute	Chronic	Fire	Pressure	Reactive	N/A
X	X	X			
–	–	–	–	–	–

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
N-hexane	110-54-3	3.00-9.99
Benzene	71-43-2	0.10-0.99

CERCLA 102(a)/DOT Hazardous Substances: (+ indicates DOT Hazardous Substance)

Seq.	Chemical Name	CAS Number	Range in %
01+	N-hexane	110-54-3	3.00-9.99
02+	Benzene	71-43-2	0.10-0.99

CERCLA/DOT Hazardous Substances (Sequence Numbers and RQ's):

Seq.	RQ
01+	5000
02+	10

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Other:
None.

State Regulations:
California Proposition 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Benzene	71-43-2

International Regulations:

WHMIS Classification:
Not determined

Canada Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australia Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:
Not determined.

Mobility:
Not determined.

Persistence and Biodegradability:
Not determined.

Potential to Bioaccumulate:
Not determined.

Remarks:
None

16. OTHER INFORMATION

It is recommended that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

The information below is given to call attention to the issue of "naturally occurring radioactive materials". Although radon-222 levels in this product do not present any direct radon exposure, customers should be aware of the potential of radon daughter product buildup within their processing streams whatever the source of their product streams. Radon-222 is a naturally occurring radioactive gas which can be a contaminant in natural gas. During subsequent processing, radon tends to be concentrated in the liquified petroleum gas stream and in product streams having a similar boiling point range. Industry experience has shown that this product may contain small amounts of radon-222 and its radioactive decay products, called radon "daughters". The actual concentration of Radon-222 and radioactive daughters in the process equipment (IE lines, filters, pumps and reactor units) may accumulate significant levels of radioactive daughters and show a gamma radiation reading during operation. A potential external radiation hazard exists at or near any pipe, valve or vessel containing a radon-enriched stream or containing internal deposits of radioactive material, due to the transmission of gamma radiation through its wall.
Field studies in the literature and conducted by company personnel at selected sites, have not shown any conditions that subject workers to cumulative exposures in excess of general population limits. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha-emitting decay products which may be a hazard if inhaled or ingested. During maintenance operations that require the opening of contaminated process equipment, the flow of gas should be stopped and a four hour delay enforced to allow the gamma radiation to drop to background levels. Protective equipment E.G. coveralls, gloves and respirator (NIOSH/MSHA approved for high efficiency particulates and radionuclides, or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion or inhalation of any residue containing alpha radiation. Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state.

Dispose of as a vapor, venting at a safe location, keeping gas below explosive limit (LEL).

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF THE PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

Date: 1999-01-04 New X Revised, Supersedes: 1998-08-04

Inquiries regarding MSDS should be directed to:
Equiva Services LLC
Manager Product Stewardship
P.O. Box 674414
Houston, TX 77267-4414

17. PRODUCT LABEL

Label Date: 1999-01-04

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

00899 E/P MIX (ETHANE/PROPANE)

WARNING STATEMENT

DANGER !	FLAMMABLE GAS - MAY CAUSE FLASH FIRE
	DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
	LIQUID MAY CAUSE FROSTBITE
	MAY CAUSE DIZZINESS AND DROWSINESS
	GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
	GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
	MAY CAUSE EYE IRRITATION
ATTENTION !	CONTAINS N-HEXANE WHICH CAN CAUSE NERVOUS SYSTEM DAMAGE
	CONTAINS BENZENE - CANCER HAZARD

PRECAUTIONARY MEASURES

-Keep away from heat, sparks or flame.
-Use only with adequate ventilation.
-Do not enter storage areas or confined spaces unless adequately ventilated.
-Use supplied air respiratory protection for cleaning large spills or upon entry into tanks, vessels, or other confined spaces.
-Avoid breathing vapor, mist, or gas.

-Avoid contact with eyes, skin, and clothing.
-Rescue procedures should be attempted ONLY after notifying others of emergency and ONLY if appropriate personal equipment is available.
-Wear insulated gloves if contact with liquid cooled equipment is expected.
-Keep container closed.
-Wash thoroughly after handling.

FIRST AID

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin Contact:
Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin.

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention.

Ingestion:
No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:
If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Note to Physician:
Overexposure to this material may sensitize the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information.
This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

FIRE

In case of fire, use dry chemical or carbon dioxide to extinguish flames. Use water spray to keep containers cool and protect personnel attempting to stop the flow of gas.

If more than 1,315 pounds of product is spilled, then report spill according to SARA 304 and/or CERCLA 102(a) requirements, unless product qualifies for the petroleum exemption (CERCLA Section 101(14)).

	Chemical Name	CAS Number	Range in %
*	Propane	74-98-6	20.00-34.99
*	Ethane	74-84-0	20.00-34.99
*	Iso-heptane	591-76-4	10.00-19.99
*	Butane,normal	106-97-8	10.00-19.99
*	Isobutane	75-28-5	3.00-9.99
*	Iso-pentane	78-78-4	3.00-9.99
*	N-pentane	109-66-0	3.00-9.99

*	Iso-hexane	107-83-5	3.00-9.99
*	N-hexane	110-54-3	3.00-9.99
*	Benzene	71-43-2	0.10-0.99

PRODUCT IS HAZARDOUS ACCORDING TO OSHA (1910.1200).
* COMPONENT IS HAZARDOUS ACCORDING TO OSHA.

Pennsylvania Special Hazardous Substance(s)	CAS Number	Range in %
Benzene	71-43-2	0.10-0.99

HMIS			NFPA		
Health:	1	Reactivity: 0	Health:	1	Reactivity: 0
Flammability:	4	Special : -	Flammability:	4	Special : -

Transportation
DOT:
Proper Shipping Name:
Hydrocarbon gas, compressed, N.O.S
Hazard Class:
2.1
Identification Number: UN 1964
Packing Group:
Label Required:
Flammable gas

This product contains a DOT Hazardous Substance or Substances, listed in Section 14 of the MSDS. If the product's shipping container holds at least 1,315 lbs, then the DOT information must be accompanied with RQ notation, or, an otherwise 'Not Regulated' product will be classified as Environmentally Hazardous (solid/liquid) N.O.S., Class 9, unless the product qualifies for the petroleum exemption (49 CFR 171.8).

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flame or heat. Keep container closed and drum bungs in place.

Name and Address:
Motiva Enterprises LLC
P.O. Box 674414
Houston ,TX 77267-4414

TRANSPORTATION EMERGENCY: (877)276-7283
CHEMTREC: (800)424-9300

HEALTH EMERGENCY: (877)276-7283

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

HUNTSMAN
Enriching lives through innovation

MSDS CODE AND NAME	:	***EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)

Chemical Name and/or Family or Description:

Glycol

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
1,2-ethanediol	107-21-1	100 mg/m³ CEILING-ACGIH (AEROSOL) (A4)	95.00-99.99
Ethanol, 2,2'-oxybis	111-46-6		3.00-9.99

REFER TO SECTION 16 OF THE MSDS FOR PROHIBITED PRODUCT APPLICATIONS.

MSDS CODE AND NAME	:	***EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

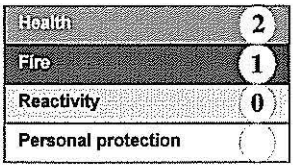
Odor:

Mild odor

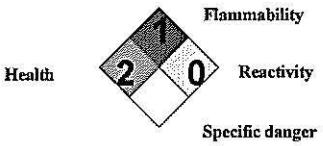
WARNING STATEMENT

WARNING !	HARMFUL OR FATAL IF SWALLOWED MAY CAUSE DIZZINESS AND DROWSINESS MAY CAUSE EYE IRRITATION ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE FOR INDUSTRIAL USE ONLY CAN CAUSE LIVER AND KIDNEY DAMAGE IF SWALLOWED
ATTENTION !	CONTAINS ETHYLENE GLYCOL WHICH MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA THIS PRODUCT IS NOT TO BE USED IN FOOD, DRUG, COSMETIC OR POTABLE WATER APPLICATIONS THIS PRODUCT IS NOT TO BE USED TO PRODUCE FOGS OR MISTS IN THEATRICAL, MUSICAL OR OTHER ENTERTAINMENT PERFORMANCES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

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COMPANY	:	**HUNTSMAN**

Ingestion: Aspiration may occur during swallowing or vomiting, resulting in lung damage. Contains ethylene glycol and/or diethylene glycol, which are toxic when swallowed. A lethal dose for an adult is 1-2 ml per kilogram, or about 4 ounces (one-half cup). Symptoms include headache, weakness, confusion, dizziness, staggering, slurred speech, loss of coordination, faintness, nausea and vomiting, increased heart rate, decreased blood pressure, difficulty breathing and seeing, pulmonary edema, unconsciousness, convulsions, collapse, and coma. Symptoms may be delayed. Decreased urine output and kidney falure may also occur. Severe poisoning may cause death.

Sensitization Properties: Unknown

Chronic:

Repeated ingestion may cause liver and kidney damage.

Medical Conditions Aggravated by Exposure:

Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition). Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Ethylene glycol (EG) and diethylene glycol (DEG) intoxication may initially produce behavioral changes, drowsiness, vomiting, diarrhea, thirst, and convulsions. EG and DEG are nephrotoxic. End stages of poisoning may include renal damage or failure with acidosis. Supportive measures, supplemented with hemodialysis if indicated, may limit the progression and severity of toxic effects.

FOR ETHYLENE GLYCOL POISONING intravenous ethanol is a recognized antidotal treatment ; other antidotal treatments also exist for EG poisoning. FOR DIETHYLENE GLYCOL POISONING the role of intravenous ethanol in the treatment is unclear but it may be of benefit in view of structural and toxicological similarities to ethylene glycol. Contact a Poison Center for further treatment information.

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

MSDS CODE AND NAME	:	***EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)***
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COMPANY	:	**HUNTSMAN**

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

117.8 (244 F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: Not Determined
Upper: Not Determined

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Ethylene glycol: OSHA CEILING 50 ppm; ACGIH CEILING 39.4 ppm (aerosol)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Mild odor

Boiling Point (degrees C):

197.8 (388 F)

Melting/Freezing Point (degrees C):

-13.3 (8 F)

Specific Gravity (water=1):

1.12

pH:

6.5

Vapor Pressure:

.1 mmHg at 20 C (68 F)

Viscosity:

18.7 cSt at 20 C (68 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

2.1

Solubility in Water (%):

>10

Other:

None

MSDS CODE AND NAME	:	***EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)***
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COMPANY	:	**HUNTSMAN**

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others None of these X

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Animal data does not reflect human toxicity; see Sections 3 & 11
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 1.00 - 2.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 1.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

Oral administration of ethylene glycol to pregnant experimental animals has been shown to cause birth defects in the offspring. These effects were not seen when ethylene glycol was administered by dermal application or by inhalation.

Continuous ingestion of a diet contaning 1% or 2% ethylene glycol for two years produced liver and kidney damage, and bladder stones in rats.

Continuous ingestion of a diet containing 2% or 4% diethylene glycol for two years produced liver and kidney damage, and bladder stones in rats. Bladder tumors, caused by repeated injury from bladder stones, were also produced.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

This product is potentially biodegradable.

MSDS CODE AND NAME	:	*EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)*
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COMPANY	:	**HUNTSMAN**

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated in drums

Hazard Class:
Not regulated in drums

Identification Number:
Not regulated in drums

Packing Group:
Not regulated in drums

Label Required:
Not regulated in drums

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not regulated for drums

Hazard Class
Not regulated for drums

Identification Number
Not regulated for drums

Packing Group
Not regulated for drums

Label Required
Not regulated for drums

ICAO

Proper Shipping Name:
Not regulated for drums

Hazard Class
Not regulated for drums

Identification Number
Not regulated for drums

Packing Group
Not regulated for drums

Label Required
Not regulated for drums

TDG

Proper Shipping Name:
Not regulated

Hazard Class:
Not regulated

Identification Number:
Not regulated

MSDS CODE AND NAME	:	***EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

Label Required:
Not regulated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute X **Chronic** X **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
1,2-ethanediol (Common Name-Ethylene glycol)	107-21-1	95.00-99.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
1,2-ethanediol (Common Name-Ethylene glycol)	107-21-1	95.00-99.99	5000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
1,2-ethanediol	FL, IL, MA, NJ, PA, RI
Ethanol, 2,2'-oxybis	PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class D, Div 1, Subdiv B: Toxic Class D, Div 2, Subdiv A: Teratogenic

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japan Ministry or International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	:	***EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)***
DATE ISSUED	:	**01/02/2006**
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COMPANY	:	**HUNTSMAN**

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Aquatic toxicity rating is believed to be > 100.00 mg/liter practically non-toxic to aquatic organisms.

Mobility:

Not determined.

Persistence and Biodegradability:

This product is considered to be readily biodegradable and is not expected to persist in the environment.

Potential to Bioaccumulate:

This product is not expected to bioaccumulate.

Remarks:

None

16. OTHER INFORMATION 01/02/2006

Acute or chronic oral consumption of products containing ethylene glycol can produce significant adverse health effects, including death, in humans and animals. Keep out of reach of children and pets.

Due to toxicity considerations with ethylene glycol, the following applications are considered to be prohibited applications: Potable Water Applications; Food, Drug and Cosmetic Formulations; Antifreeze for potable water systems in recreational vehicles and seasonal homes; Antifreeze for fire sprinkler systems.

This product is not to be used to produce fogs or mists in theatrical, musical or other entertainment performances.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Supercedes: 7/1/2004 **The following section has been revised: 3**

Date Issued: 01/02/2006.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

MSDS CODE AND NAME	:	*EGAFG ETHYLENE GLYCOL-AFG (FOR ANTIFREEZE BLENDING)*
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

MATERIAL SAFETY DATA SHEET

HUNTSMAN
Enriching lives through innovation

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	***EGPE ETHYLENE GLYCOL-POLYESTER GRADE***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

EGPE ETHYLENE GLYCOL-POLYESTER GRADE

Chemical Name and/or Family or Description:

Glycol

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
1,2-ethanediol (Common Name-Ethylene glycol)	107-21-1	100 mg/m³ CEILING-ACGIH (AEROSOL) (A4)	95.00-99.99

REFER TO SECTION 16 OF THE MSDS FOR PROHIBITED PRODUCT APPLICATIONS.

MSDS CODE AND NAME	:	***EGPE ETHYLENE GLYCOL-POLYESTER GRADE***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

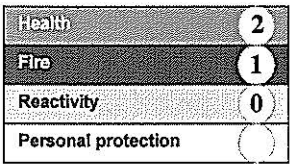
Odor:

Mild odor

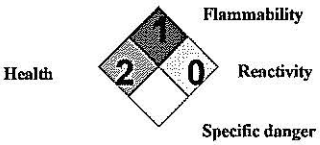
WARNING STATEMENT

WARNING !	HARMFUL OR FATAL IF SWALLOWED MAY CAUSE DIZZINESS AND DROWSINESS MAY CAUSE EYE IRRITATION ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE FOR INDUSTRIAL USE ONLY CAN CAUSE LIVER AND KIDNEY DAMAGE IF SWALLOWED
ATTENTION !	CONTAINS ETHYLENE GLYCOL WHICH MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA THIS PRODUCT IS NOT TO BE USED IN FOOD, DRUG, COSMETIC OR POTABLE WATER APPLICATIONS THIS PRODUCT IS NOT TO BE USED TO PRODUCE FOGS OR MISTS IN THEATRICAL, MUSICAL OR OTHER ENTERTAINMENT PERFORMANCES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes:	May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.
Skin:	Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.
Inhalation:	Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

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DATE ISSUED	:	**01/02/2006**
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Ingestion: Aspiration may occur during swallowing or vomiting, resulting in lung damage. Contains ethylene glycol and/or diethylene glycol, which are toxic when swallowed. A lethal dose for an adult is 1-2 ml per kilogram, or about 4 ounces (one-half cup). Symptoms include headache, weakness, confusion, dizziness, staggering, slurred speech, loss of coordination, faintness, nausea and vomiting, increased heart rate, decreased blood pressure, difficulty breathing and seeing, pulmonary edema, unconsciousness, convulsions, collapse, and coma. Symptoms may be delayed. Decreased urine output and kidney falure may also occur. Severe poisoning may cause death.

Sensitization Properties: Unknown

Chronic:

Repeated ingestion may cause kidney damage.

Medical Conditions Aggravated by Exposure:

Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition). Repeated overexposure may aggravate existing kidney disease.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Ethylene glycol (EG) and diethylene glycol (DEG) intoxication may initially produce behavioral changes, drowsiness, vomiting, diarrhea, thirst, and convulsions. EG and DEG are nephrotoxic. End stages of poisoning may include renal damage or failure with acidosis. Supportive measures, supplemented with hemodialysis if indicated, may limit the progression and severity of toxic effects.

FOR ETHYLENE GLYCOL POISONING intravenous ethanol is a recognized antidotal treatment ; other antidotal treatments also exist for EG poisoning. FOR DIETHYLENE GLYCOL POISONING the role of intravenous ethanol in the treatment is unclear but it may be of benefit in view of structural and toxicological similarities to ethylene glycol. Contact a Poison Center for further treatment information.

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

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DATE ISSUED	:	**01/02/2006**
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COMPANY	:	**HUNTSMAN**

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

117.8 (244 F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: Not Determined
Upper: Not Determined

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Ethylene glycol: OSHA CEILING 50 ppm; ACGIH CEILING 39.4 ppm (aerosol)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Mild odor

Boiling Point (degrees C):

197.8 (388 F)

Melting/Freezing Point (degrees C):

-13.3 (8 F)

Specific Gravity (water=1):

1.12

pH:

6.5

Vapor Pressure:

.1 mmHg at 20 C (68 F)

Viscosity:

18.7 cSt at 20 C (68 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

2.1

Solubility in Water (%):

>10

Other:

None

MSDS CODE AND NAME	:	***EGPE ETHYLENE GLYCOL-POLYESTER GRADE***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others None of these X

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Animal data does not reflect human toxicity; see Sections 3 & 11
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 1.00 - 2.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 1.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

Oral administration of ethylene glycol to pregnant experimental animals has been shown to cause birth defects in the offspring. These effects were not seen when ethylene glycol was administered by dermal application or by inhalation. Continuous ingestion of a diet contaning 1% or 2% ethylene glycol for two years produced liver and kidney damage, and bladder stones in rats.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

This product is potentially biodegradable.

MSDS CODE AND NAME	:	*EGPE ETHYLENE GLYCOL-POLYESTER GRADE*
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COMPANY	:	**HUNTSMAN**

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated for drums

Hazard Class:
Not regulated for drums

Identification Number:
Not regulated for drums

Packing Group:
Not regulated for drums

Label Required:
Not regulated for drums

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not regulated for drums

Hazard Class
Not regulated for drums

Identification Number
Not regulated for drums

Packing Group
Not regulated for drums

Label Required
Not regulated for drums

ICAO

Proper Shipping Name:
Not regulated for drums

Hazard Class
Not regulated for drums

Identification Number
Not regulated for drums

Packing Group
Not regulated for drums

Label Required
Not regulated for drums

TDG

Proper Shipping Name:
Not regulated

Hazard Class:
Not regulated

Identification Number:

MSDS CODE AND NAME	:	***EGPE ETHYLENE GLYCOL-POLYESTER GRADE***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

Not regulated

Label Required:
Not regulated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute X **Chronic** X **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
1,2-ethanediol (Common Name-Ethylene glycol)	107-21-1	95.00-99.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
1,2-ethanediol (Common Name-Ethylene glycol)	107-21-1	95.00-99.99	5000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
1,2-ethanediol	FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class D, Div 1, Subdiv B: Toxic Class D, Div 2, Subdiv A: Teratogenic

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	:	***EGPE ETHYLENE GLYCOL-POLYESTER GRADE***
DATE ISSUED	:	**01/02/2006**
DATE PRINTED	:	**07/05/2006**
COMPANY	:	**HUNTSMAN**

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Aquatic toxicity rating is believed to be > 100.00 mg/liter practically non-toxic to aquatic organisms.

Mobility:

Not determined.

Persistence and Biodegradability:

This product is considered to be readily biodegradable and is not expected to persist in the environment.

Potential to Bioaccumulate:

This product is not expected to bioaccumulate.

Remarks:

None

16. OTHER INFORMATION 01/02/2006

Acute or chronic oral consumption of products containing ethylene glycol can produce significant adverse health effects, including death, in humans and animals. Keep out of reach of children and pets.

Due to toxicity considerations with ethylene glycol, the following applications are considered to be prohibited applications: Potable Water Applications; Food, Drug and Cosmetic Formulations; Antifreeze for potable water systems in recreational vehicles and seasonal homes; Antifreeze for fire sprinkler systems.

This product is not to be used to produce fogs or mists in theatrical, musical or other entertainment performances.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Supercedes: 7/1/2004 **The following section has been revised: 3**

Date Issued: 01/02/2006.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR

MSDS CODE AND NAME	:	*EGPE ETHYLENE GLYCOL-POLYESTER GRADE*
DATE ISSUED	:	**01/02/2006**
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COMPANY	:	**HUNTSMAN**

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*ETHYLENE ETHYLENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

ETHYLENE ETHYLENE

Chemical Name and/or Family or Description:

Olefin

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethylene	74-85-1		100

MSDS CODE AND NAME	:	*ETHYLENE ETHYLENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

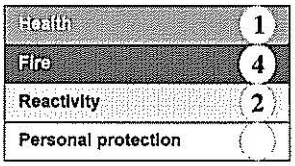
Odor:

Sweet odor

WARNING STATEMENT

DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

MSDS CODE AND NAME	:	*ETHYLENE ETHYLENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

490 (914 F)

Flash Point (degrees C):

Not applicable.

Flammable Limits % (Lower-Upper):

Lower: 2.7
Upper: 35

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Readily forms explosive air-vapor mixtures; may release explosive vapors that travel, be ignited at remote locations, and flash back. Containers may explode in fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Exposures to ethylene gas should not be allowed to exceed one-fifth (20% by volume) of the lower explosion limit (LEL). This is calculated to be 5500 ppm.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

MSDS CODE AND NAME	:	*ETHYLENE ETHYLENE*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Sweet odor

Boiling Point (degrees C):

-109.4 (-165 F)

Melting/Freezing Point (degrees C):

-168.7 (-272 F)

MSDS CODE AND NAME	: *ETHYLENE*	*ETHYLENE*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

Specific Gravity (water=1):

.6

pH:

Not applicable.

Vapor Pressure:

> 760 mmHg at 20 C (68 F)

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

1

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

None

MSDS CODE AND NAME	:	*ETHYLENE ETHYLENE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	HUNTSMAN

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethylene, compressed

Hazard Class:
2.1

Identification Number:
UN 1962

Packing Group:

Label Required:
Flammable gas

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ

None.

Section 311 Hazardous Categorization:
Acute Chronic Fire X Pressure X Reactive X N/A

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethylene	74-85-1	100

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethylene	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not applicable.

MSDS CODE AND NAME	: *ETHYLENE*	*ETHYLENE*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

Potential to Bioaccumulate:

Not applicable.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Dispose of as a vapor, venting at a safe location, keeping gas below explosive limit (LEL).

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*EO ETHYLENE OXIDE*
DATE ISSUED	:	**04/08/2005**
DATE PRINTED	:	**02/15/2006**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

EO ETHYLENE OXIDE

Chemical Name and/or Family or Description:

Alkylene oxide

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (281) 719-7400

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA X **IARC** X **NTP** X **OTHER** X **NONE**

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethylene oxide	75-21-8	1 ppm TWA-ACGIH-(A2) 1 ppm TWA-OSHA (SUBJECT TO 29 CFR 1910.1047) 5 ppm STEL-OSHA	100

MSDS CODE AND NAME	:	***EO ETHYLENE OXIDE***
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COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

Odor:

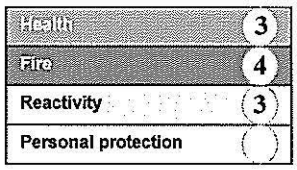
Ether-like odor

WARNING STATEMENT

DANGER !

FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
LIQUID MAY CAUSE FROSTBITE
HARMFUL IF INHALED
MAY CAUSE DIZZINESS AND DROWSINESS
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
MAY CAUSE ALLERGIC SKIN REACTION
MAY CAUSE BLOOD EFFECTS, LIVER, AND KIDNEY DAMAGE BASED ON ANIMAL DATA
CONTAINS ETHYLENE OXIDE - CANCER HAZARD AND REPRODUCTIVE HAZARD - CAN CAUSE NERVE DAMAGE

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness. Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Skin contact with liquid product can cause frostbite (cold burns). Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Gas is irritating and causes nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may cause lung damage. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Inhalation may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: This product or a component of this product is a known human skin sensitizer. Therefore, contact with this product may cause an allergic skin reaction in sensitive, exposed persons.

Chronic:

According to IARC and OSHA, ethylene oxide is a human carcinogen. Prolonged and repeated overexposure has reportedly produced symptoms of neurotoxicity experienced as weakness in the hands and feet, accompanied by a tingling sensation in some cases. In most cases, these symptoms resolved after exposure was terminated. Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Overexposure may aggravate existing blood disorders, such as anemia. Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate or enhance existing nervous system dysfunction.

Other Remarks:

OSHA has defined ethylene oxide as a reproductive and cancer hazard. IARC has classified ethylene oxide as a Group I carcinogen ("carcinogenic to humans"). Ethylene oxide is a mutagen. Increased incidences of chromosomal aberrations and sister chromatid exchanges have been observed in workers exposed to ethylene oxide. The relevance of these findings in evaluating human health effects is currently unknown.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse. In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Inhalation exposure may result in respiratory tract injury, the delayed onset of pulmonary edema, and may predispose patient to secondary respiratory infection. Persons exposed to high concentrations should be hospitalized for observation. Contact a Poison Center for additional treatment information.

MSDS CODE AND NAME	:	*EO ETHYLENE OXIDE*
DATE ISSUED	:	**04/08/2005**
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COMPANY	:	**HUNTSMAN**

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

429 (804 F)

Flash Point (degrees C):

-57 (-70.6F) CC

Flammable Limits % (Lower-Upper):

Lower: 3
Upper: 100

Recommended Fire Extinguishing Agents And Special Procedures:

Dilution with 23 volumes of water renders ethylene oxide nonflammable. A ratio of 100 volumes of water to one (1) volume of ethylene oxide is required to prevent the build-up of flammable vapors in closed or confined areas. Fight fire from protected location or maximum possible distance. Use dry chemical, alcohol resistant foam, carbon dioxide, or water spray. Due to the explosive nature of ethylene oxide, consider extinguishing the fire rather than allowing the fire to burn itself out. Use water spray to cool fire-exposed containers, equipment, and piping containing ethylene oxide. Since ethylene oxide vapors will decompose violently and explosively at temperatures above 1040 degrees F, extinguishing fires that impinge on, or are in close proximity to equipment containing ethylene oxide may be preferred even before the source of the burning hydrocarbon material is eliminated.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers. Explosive air-vapor mixtures may form.

Special Protective Equipment for Firefighters:

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power equipment. Stop flow of vapor or liquid at source if possible. Ventilate area of spill or leak. Barricade the immediate hazard area. Keep people away. Stay upwind and warn of possible downwind explosive and toxic hazards. Avoid breathing vapor, and contact with skin, eyes, or clothing. Wear pressure demand air supplied respirators when the airborne concentration of the ethylene oxide or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

Contain spill if possible, prevent entry into sewers and waterways, and dilute with large quantities of water. Dilution with 23 volumes of water renders ethylene oxide nonflammable. A ratio of 100 volumes of water to one (1) volume of ethylene oxide is required to prevent the build-up of flammable vapors in closed or confined areas. Ethylene oxide in the containment area should be diluted with large volumes of water, and flushed into a sump or collection area for subsequent treatment or disposal.

Because of the unique reactive characteristics of ethylene oxide, clean up of spills should only be directed by individuals knowledgeable of the hazards associated with ethylene oxide.

Since ethylene oxide is highly reactive, contact with absorbents could generate substantial heat, and is to be avoided unless highly diluted with water. Do not use vacuum trucks to clean up spills unless special precautions are taken.

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DATE ISSUED	:	**04/08/2005**
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7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports. Eye wash and safety shower should be available nearby when this product is handled or used. . Solid or semi-solid self-polymerized ethylene oxide residue in empty containers can release significant amounts of ethylene oxide vapor. Therefore, appropriate precautions should be taken when cleaning residual polymerized ethylene oxide from tanks and storage vessels.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing, such as coveralls or lab coats, and gloves must be worn. Launder or dry clean when soiled. When handling large quantities, chemical resistant suits, gloves, and boots must be worn. Selected protection should resist hazards such as tears, cuts, punctures, and abrasion. Leather shoes must be immediately removed if contaminated.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor or mist is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Ethylene oxide: OSHA PEL-TWA 1 ppm; PEL-STEL 5 ppm; ACGIH TLV-TWA 1 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Ether-like odor

Boiling Point (degrees C):

10.7 (51.3 F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

.8711

pH:

Not applicable.

Vapor Pressure:

1095 mmHg at 20 C (68 F)

Viscosity:

.3 cSt at 0 C (32 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

1.4

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others** X **None of these**

Comments:

This material reacts with strong oxidizers, acids, bases, and acetylide-forming metals such as copper, silver, mercury, and their alloys. Since contact of ethylene oxide with some absorbents generates heat, use of absorbents should be avoided for spill cleanup should be avoided and only considered if the ethylene oxide has been highly diluted with water.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 .33 g/kg (rat) toxic
Inhalation:
4 hr. LC50 800.00 ppm (gas, vapor) (rat) toxic
Dermal:
LD50 Believed to be > 1.00 - 2.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

Animal Studies:

Chronic (2 year) inhalation exposures to ethylene oxide have resulted in tumors in both rats and mice. Subchronic (typically 90 days or less) exposures to ethylene oxide (several studies in rodents, dogs and monkeys) have resulted in neuromuscular toxicity, and lung, kidney and liver damage. One study has shown effects on the testes of rats at high concentrations of ethylene oxide, but this effect was not observed in other studies. Although embryo/fetal toxicity has been observed in rodents exposed to high concentrations of ethylene oxide, there is no evidence that ethylene oxide causes birth defects.

Human studies:

The National Institute of Occupational Safety and Health (NIOSH) has recently (2004) published an update of a previous study examining the causes of mortality in a group of ethylene oxide sterilant workers. The results of this study showed that there was no increased mortality from cancer for this group of workers, and that there was no increased mortality of the group due to leukemia or lymphoma. The study did show that male workers in this study who were exposed to relatively high concentrations of ethylene oxide over a long period of time have an increased risk of developing leukemia or lymphoma.

NIOSH has also recently (2003) published a study of breast cancer incidence in female ethylene oxide sterilant workers. The results of this study showed that there was no increased mortality from breast cancer for these workers. However, the study did show that female workers in this study who were exposed to relatively high concentrations of ethylene oxide over a long period of time have an increased risk of developing breast cancer.

It should be noted that there are some uncertainties in the study data that make it difficult to determine the cause or causes of the association between exposures to high concentrations of ethylene oxide and cancer. The findings of increased cancer risk were seen in workers exposed prior to 1985, when permissible workplace exposure levels were higher than they are today. Other worker exposure studies are inconsistent with regard to ethylene oxide exposures and increased risk of developing these cancers.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability and reactivity, and, if discarded in its present form, would have the hazardous waste number of D001 and D003. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to, ignitability and reactivity.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethylene oxide

Hazard Class:
2.3/2.1

Identification Number:
UN 1040

Packing Group:

Label Required:
Poison gas, Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Ethylene oxide

Hazard Class:
2.3/2.1

Identification Number:
UN 1040

Label Required:
Poison gas, Flammable gas

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
Ethylene oxide	75-21-8	100	1000	10

Section 311 Hazardous Categorization:

Acute X **Chronic** X **Fire** X **Pressure** X **Reactive** X **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethylene oxide	75-21-8	100

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethylene oxide	75-21-8	100	10

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethylene oxide	CT, FL, IL, LA, MA, NJ, PA, RI, MI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Ethylene oxide	75-21-8

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

MSDS CODE AND NAME	:	***EO ETHYLENE OXIDE***
DATE ISSUED	:	**04/08/2005**
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COMPANY	:	**HUNTSMAN**

This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class D, Div 1, Subdiv A: Very toxic Class D, Div 2, Subdiv A: Carcinogenic Class B, Div 1: Flammable gas

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 10.00 - 100.00 ppm slightly toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 04/08/2005

CAUTION! DO NOT ALLOW UNTRAINED WORKERS TO HANDLE THIS MATERIAL!

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Supercedes: 7/1/2004 **The following sections have been revised: 5.6,8,10**

Date Issued: 04/08/2005.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

MSDS CODE AND NAME	:	*EO ETHYLENE OXIDE*
DATE ISSUED	:	**04/08/2005**
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COMPANY	:	**HUNTSMAN**

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

PRODUCT SAFETY DATA SHEET

To: Huntsman
Attn: VICTOR
JC02224

Full Range Naphtha 2000-06-27

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Full Range Naphtha
Grades:
Use: Cracking feedstock and gasoline component

2. COMPOSITION / INFORMATION ON INGREDIENTS

No	Name	CAS-No	%-mass	Symbol(s)	R Phrases
1	Naphtha FR	64741-42-0	100	F+,T,Xn,N	R12,R45,R38,R65,R67,R51/53
2	Benzene	71-43-2	<5	F+,T	R45,R11,R48/23/34/25
3	N-hexane	110-54-3	<5	F+,Xn	R11,R38,R48/20,R51/53,R62,R65,R67

3. HAZARDS IDENTIFICATION

Health: Slightly irritating to the eye.
Unlikely to cause immediate irritation but prolonged and repeated contact may be harmful to the skin.
The vapours can be absorbed into the body through inhalation and at high concentrations may cause dizziness, drowsiness and headache.
Irritating to the digestive organs.
See "Additional information" below.

Environmental: Spilled liquid is harmful to the environment.

Physical / Chemical: Extremely flammable. Explosive air/vapour mixtures may form at ambient temperatures.

Additional Information: The main hazard following ingestion is aspiration into the lungs and subsequent chemical pneumonitis. Therefore emptying of the stomach by any method is not recommended except under experienced medical supervision.

4. FIRST AID MEASURES

Eyes: Flush the eye with copious amounts of water. No emergency measures are necessary but if adverse eye effects follow, refer for medical attention.
Skin: Wash the contaminated skin thoroughly with soap and water. Remove contaminated clothing. If skin irritation persists refer for medical attention.
Inhalation: Remove the affected person to fresh air. If recovery is not rapid, obtain medical attention.
Ingestion: DO NOT INDUCE VOMITING. Refer for medical attention.
Additional Information: None

Extinguishing media: Suitable: Dry chemical, foam, CO2.
Not to be used: Direct water jet. Use water ONLY to keep fire-exposed containers cool.

Specific exposure hazards:
Can be ignited by flame or sparks under all normal atmospheric conditions. Vapours may form explosive mixtures with air. Avoid electrostatic build-up.

Special protective equipment for firefighters:
Use self-contained breathing equipment when fighting fire in confined spaces.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Avoid skin contact and inhalation of vapours during disposal of spills.
Environmental precautions: Water may be used to flush spills away from sources of ignition.
Do not allow the product to enter public drainage system or open water courses.
Methods for cleaning up: Absorb and scrape up.
Absorbent materials: Sand or active clay.

7. HANDLING AND STORAGE

Handling: Avoid prolonged or repeated skin contact.
Avoid inhalation of vapour.
Do not wear contaminated clothing.
Eliminate all sources of ignition.
Storage: Store in a cool, well-ventilated area away from potential sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Use only in well-ventilated areas.
Control parameters: TWA TLV (ACGIH) : 300 ppm. However, in all circumstances exposure should be kept as low as reasonably possible by good ventilation and safe working practices.
EU Occupational Exposure Limit Value: Benzene: 1 ppm (3.25 mg/m3)- skin.
Respiratory protection: Inhalation of the vapours, fumes or mists should be avoided by safe working practices and good ventilation.
Eye protection: If there is a risk of splashing while handling product, eye protection should be worn (e.g. full face shield or goggles with side shields).
Skin protection: Prolonged and repeated skin contact should be avoided by the use of clean gloves and clean overalls.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Liquid
Colour	:	Light yellow
Appearance	:	Bright & clear
Odour	:	Characteristic
pH	:	Neutral
Boiling range, °C	:	25 - 220
Melting Point. °C	:	< -50
Flash Point, °C	:	< -40 (ASTM D56)
Autoflammability/ ignition, °C	:	> 400
Upper explosion limit	:	7.6 % vol. -air (oil base)
Lower explosion limit	:	1.4 % vol. -air (oil base)
Vapour pressure, 20 °C, kPa	:	35 - 100
Viscosity, kinematic, 40 °C, mm²/s	:	< 1
Relative density, 15 °C	:	0.650-0.725
Water solubility	:	0.006 % m
Partition coefficient, n-octanol/water	:	2 - 7

10. STABILITY AND REACTIVITY

Conditions / materials to avoid:
Stable. May react with strong oxidizing agents.

Hazardous decomposition products:
Thermal decomposition or incomplete combustion may produce oxides of carbon and irritating fumes.

11. TOXICOLOGICAL INFORMATION

Eyes: Slightly irritating to the eye.
Skin: Although contact with the skin of short duration causes only mild irritation, prolonged wetting of the skin may lead to chemical burns.
Inhalation: Toxic hazard following single exposure to high levels is of a low order. Prolonged exposure to high vapour concentrations can lead to nausea, headache, dizziness, drunken behaviour with consequent impaired judgement, loss of consciousness, and death in oxygen deficient environment (e.g. tank cleaning).
Ingestion: Accidental ingestion may lead to aspiration into the lungs and subsequent chemical pneumonitis.
Other: Because the benzene content is greater than 0.1%, this product has to be classified as a category 2 carcinogen.

12. ECOLOGICAL INFORMATION

Mobility: Aquatic toxicity expected to be in the range 1 - 100 mg/l. Not readily biodegradable. If released into the environment, the product will rapidly disperse into the atmosphere where it will undergo photochemical degradation. Spillages may penetrate the soil causing ground water pollution.
Degradability: Not readily biodegradable.
Ecotoxicity/bioaccumulation: Aquatic toxicity expected to be in the range 1 - 100 mg/l.

13. DISPOSAL CONSIDERATIONS

Transport to authorized waste location, or incinerate under controlled conditions.

14. TRANSPORT INFORMATION

UN-no: 1268
RID / ADR: 3, 3b)
IMO: 3.1
IATA / ICAO: 1268 class 3 Packing Group I
Other: -

15. REGULATORY INFORMATION

EC Labeling / Classification

21-07-00

EXTREMELY FLAMMABLE [redacted] TOXIC DANGEROUS FOR THE ENVIRONMENT

Contains: Low boiling point naphtha, EC No. 265-042-6

R phrases:
R 12: Extremely flammable.
R 45: May cause cancer.
R 38: Irritating to skin.
R 65: Harmful: May cause lung damage if swallowed.
R 67: Vapours may give drowsiness and dizziness.
R 51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S phrases:
S 53: Avoid exposure - obtain special instructions before use.
S 45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 62: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.
Restricted to professional users.

Other regulations: EU Occupational Exposure Limit Value: Benzene: 1 ppm (3.25 mg/m3)- skin.

16. OTHER INFORMATION

CONCAWE product dossier no. 92/103 "gasolines".

21-07-00

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*HYDROGEN HYDROGEN*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

HYDROGEN HYDROGEN

Chemical Name and/or Family or Description:

Hydrogen

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Hydrogen	1333-74-0		100

MSDS CODE AND NAME	: *HYDROGEN*	*HYDROGEN*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

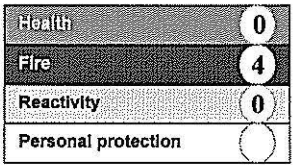
Odor:

Odorless

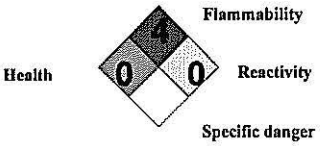
WARNING STATEMENT

DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

MSDS CODE AND NAME	: *HYDROGEN*	*HYDROGEN*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

500 (932 F)

Flash Point (degrees C):

Not applicable.

Flammable Limits % (Lower-Upper):

Lower: 4
Upper: 75

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

No special equipment or procedures required.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

MSDS CODE AND NAME	:	*HYDROGEN HYDROGEN*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Simple asphyxiant - has poor warning properties and can displace air causing an oxygen deficiency. Maintain 19.5% oxygen (by volume) in confined spaces.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Odorless

Boiling Point (degrees C):

-252.2 (-422 F)

Melting/Freezing Point (degrees C):

-258.7 (-434 F)

Specific Gravity (water=1):

Not applicable.

pH:

Not applicable.

Vapor Pressure:

> 760 mmHg at 20 C (68 F)

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

.1

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Water vapor.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

None

MSDS CODE AND NAME	: *HYDROGEN*	*HYDROGEN*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: **HUNTSMAN**	

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Hydrogen, compressed

Hazard Class:
2.1

Identification Number:
UN 1049

Packing Group:

Label Required:
Flammable gas

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ

MSDS CODE AND NAME	:	***HYDROGEN HYDROGEN***
DATE ISSUED	:	***7/1/2004***
DATE PRINTED	:	***7/1/2004***
COMPANY	:	***HUNTSMAN***

None.

Section 311 Hazardous Categorization:
Acute Chronic Fire X Pressure X Reactive N/A

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Hydrogen	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

MSDS CODE AND NAME	:	***HYDROGEN HYDROGEN***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Dispose of as a vapor, venting at a safe location, keeping gas below explosive limit (LEL).

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

CS50 LIQUID CAUSTIC SODA 50 %

Chemical Name and/or Family or Description:

Inorganic base

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Sodium hydroxide	1310-73-2	2 mg/m3 CEILING-ACGIH 2 mg/m3 CEILING-OSHA	50.00-64.99
Water	7732-18-5		50.00-64.99

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

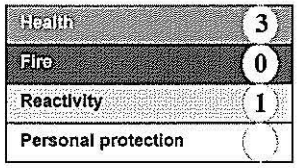
Odor:

Odorless

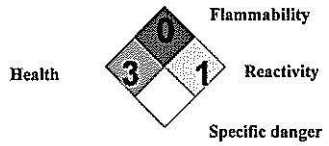
WARNING STATEMENT

DANGER ! CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease.

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information. Inhalation exposure may result in respiratory tract injury, the delayed onset of pulmonary edema, and may predispose patient to secondary respiratory infection. Persons exposed to high concentrations should be hospitalized for observation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not applicable.

Flash Point (degrees C):

Not applicable.

Flammable Limits % (Lower-Upper):

Lower: Not Determined
Upper: Not Determined

Recommended Fire Extinguishing Agents And Special Procedures:

Product is not combustible. Use agent suitable for surrounding fire. Use water spray to cool fire-exposed containers.

Unusual or Explosive Hazards:

Unstable, or air-reactive or water-reactive chemical involved. (See Section 10.)

Special Protective Equipment for Firefighters:

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Contain spill if possible. Do not touch spilled material. Stop leak if you can do it without risk. Avoid contact with skin, eyes, or clothing; wear gloves, goggles, and protective clothing. For small spills, take up with sand or absorbant material; place into containers for later disposal. Neutralize remaining traces with dilute inorganic acid; flush with water followed by liberal covering of sodium bicarbonate. All clean up materials should be removed and placed into approved containers for proper treatment or disposal. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Avoid contact with aluminum, tin, zinc, or their alloys. Avoid water contamination. This product may react violently or explosively if mixed with water or acids. This product can react explosively with many organic chemicals. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Odorless

Boiling Point (degrees C):

140 - 142.2 (284 - 288 F)

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Melting/Freezing Point (degrees C):

Not determined.

Specific Gravity (water=1):

1.5

pH:

14

Vapor Pressure:

13 mmHg at 60 C (140 F)

Viscosity:

< 20 cSt at 40 C (104 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

Not determined.

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water X **Heat Strong Oxidizers Others** X **None of these**

Comments:

This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Not combustible; may produce corrosive vapors when heated. Toxic sodium oxide fumes can be generated by thermal decomposition at elevated temperatures.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > .05 - .50 g/kg (rat) toxic
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

None

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of corrosivity, and, if discarded in its present form would have the hazardous waste number of D002. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to corrosivity.

Remarks:

Do not allow to enter drains or sewers. Do not allow to drain into surface waters.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Sodium hydroxide solution

Hazard Class:
8

Identification Number:
UN 1824

Packing Group:
II

Label Required:
Corrosive

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:

Not evaluated

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute X **Chronic** **Fire** **Pressure** **Reactive** X **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Sodium hydroxide	1310-73-2	50.00-64.99	1000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Sodium hydroxide	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 1, Subdiv B: Toxic Class E: Corrosive

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	:	*CS50 LIQUID CAUSTIC SODA 50 %*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

None

Date Issued: 7/1/2004.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

NCP 1011

DU PONT

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

NAME
Methanol

GRADE
Technical

SYNONYMS
Methyl Alcohol; Wood Alcohol; Carbinol

CAS NAME
Methanol

CAS REGISTRY
67-56-1

ID NOS./CODES
NIOSH Registry No: PC 1400000

MANUFACTURER/DISTRIBUTOR
Du Pont Company

ADDRESS
Wilmington, DE 19898

CHEMICAL FAMILY
Alcohol

FORMULA
CH_3OH

TSCA INVENTORY STATUS
Reported/Included

SARA/TITLE III STATUS
See HAZARDOUS COMPONENTS and ADDITIONAL INFORMATION Sections

PRODUCT INFORMATION PHONE
(800) 441-9442

MEDICAL EMERGENCY PHONE
(800) 441-3637

TRANSPORTATION EMERGENCY PHONE
CHEMTREC (800) 424-9300

PHYSICAL DATA

BOILING POINT, 760 mmHg
64.7°C (148.4°F)

SPECIFIC GRAVITY
0.791 at 20°C (68°F)

VAPOR DENSITY
1.1 (Air = 1)

pH INFORMATION
Not available.

FORM
Liquid

COLOR
Colorless

FREEZING POINT
-97.7°C (-143.8°F)

VAPOR PRESSURE
127 mmHg at 25°C (77°F)
238 mmHg at 37.7°C (100°F)

SOLUBILITY IN WATER
100%

EVAPORATION RATE (Butyl Acetate = 1)
Greater than 1

APPEARANCE
Clear

ODOR
Faint alcoholic

HEALTH HAZARD INFORMATION

PRINCIPAL HEALTH HAZARDS (Including Significant Routes, Effects, Symptoms of Overexposure, and Medical Conditions Aggravated by Exposure)

Harmful if inhaled or absorbed through skin; causes damage to liver, kidney, and nervous system. Causes eye and skin irritation. May be fatal or cause blindness if swallowed. Cannot be made nonpoisonous.

ANIMAL DATA:

Inhalation 1-hour LC_{50}: >145,000 ppm in rats
Skin absorption LD_{50}: 15,840 mg/kg in rabbits
Oral LD_{50}: 9100 mg/kg in rats

The compound is an eye and skin irritant. Toxic effects described in animals from short exposures by inhalation, ingestion, or skin contact include anaesthetic effects, liver effects, blindness, and acidosis. Information available on reproductive effects is not sufficient to characterize the reproductive hazard. The compound produced developmental effects in rats exposed by inhalation to 10,000 or 20,000 ppm, but because maternal effects also occurred at these high concentrations, it was concluded that methanol is not a significant hazard to the conceptus. Tests in bacterial or mammalian cell cultures demonstrate no mutagenic activity.

HUMAN HEALTH EFFECTS:

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may include nonspecific discomfort such as nausea, headache, or weakness; temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness; or blindness. Higher exposures may lead to abnormal liver function as detected by laboratory tests; abnormal kidney function as detected by laboratory tests; or fatality from gross overexposure. Ingestion of as little as 60 mL may cause blindness or fatality. No evidence of reproductive effects has been reported for humans. Skin permeation can occur in amounts capable of producing system toxicity.

Individuals with preexisting diseases of the retina or liver may have increased susceptibility to the toxicity of excessive exposures.

CARCINOGENICITY

Not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

EXPOSURE LIMITS [PEL (OSHA), TLV (ACGIH), AEL (DU PONT), ETC.]

The OSHA, ACGIH, and Du Pont exposure limits for methanol are:

OSHA = 200 ppm, 260 mg/m^3 (8-hour TWA); STEL = 250 ppm, 325 mg/m^3.
ACGIH = 200 ppm, 262 mg/m^3 (TLV-TWA); STEL = 250 ppm, 328 mg/m^3.
Du Pont = 200 ppm (8- and 12-hour TWA).

All these limits carry a "skin" notation indicating that methanol liquid and vapor can penetrate skin and mucous membrane. Therefore, control of inhalation alone may not be sufficient to prevent an excessive dose. Also, in its "Notice of Intent to Establish", ACGIH lists Biological Exposure Indices for methanol in urine of 15 mg/L (end of shift), and for formic acid in urine of 80 mg/g creatine (before the shift at end of workweek).

HEALTH HAZARD INFORMATION (cont'd)

SAFETY PRECAUTIONS

Avoid contact with eyes, skin, and clothing.
Avoid prolonged or repeated breathing of vapor.
Wash thoroughly after handling.

FIRST AID

Ingestion of as little as 60 mL may cause blindness or fatality. Immediately give two glasses of water and induce vomiting. Call a physician. Never give anything by mouth to an unconscious person.

If inhaled: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

In case of contact: Immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing and shoes before reuse.

NOTE TO PHYSICIAN:

Provide standard methanol ingestion treatment. To prepare the antidote, make a solution using 100 mL of 100-proof ethyl alcohol (grain alcohol) in 2000 mL of water and give 1.5 mL/kg of body weight, or 100 mL for an average adult. Following this, at 2 hour intervals for 4 days, give the antidote (0.5-1.0 mL/kg of body weight, orally or intravenously) to reduce the metabolism of the methanol and to allow time for its excretion. Blood ethanol levels should be 1.0-1.5 mg/mL.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES

Good general ventilation should be provided to keep vapor concentrations below the exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Have available and wear as appropriate: coverall chemical splash goggles; safety spectacles (side shields preferred); full-length face shield; hard hat with brim; flame resistant work clothing; chemical resistant gloves, clothing, footwear, and apron; NIOSH/MSHA approved respiratory protection.

DISPOSAL INFORMATION

AQUATIC TOXICITY

The compound has very low toxicity. The 96-hour LC_{50} for fathead minnows is 28,100 mg/L.

SPILL, LEAK OR RELEASE

Dike large spills. Flush spill area with plenty of water. Do not flush to sewer. Comply with Federal, State, and local regulations on reporting releases. The CERCLA Reportable Quantity is 5000 lbs.

WASTE DISPOSAL

This material is a RCRA listed hazardous waste. Comply with Federal, State and local regulations on disposal. If approved, incineration, bio-oxidation, subsurface injection, or a licensed disposal contractor may be used.

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*MEA MONOETHANOLAMINE, MEA*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

MEA MONOETHANOLAMINE, MEA

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2-amino-	141-43-5	6 ppm STEL-ACGIH 3 ppm TWA-OSHA 6 ppm STEL-OSHA 3 ppm TWA-ACGIH	100

MSDS CODE AND NAME	:	*MEA MONOETHANOLAMINE, MEA*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

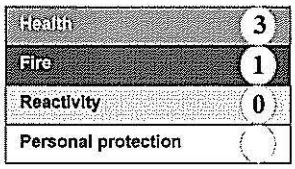
Odor:

Ammonia-like odor

WARNING STATEMENT

DANGER ! CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
MAY CAUSE DIZZINESS AND DROWSINESS
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
MAY CAUSE LIVER AND KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

95.5 (204 F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 5
Upper: 17

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

MSDS CODE AND NAME	:	*MEA MONOETHANOLAMINE, MEA*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Monoethanolamine (ethanolamine): OSHA PEL-TWA 3.0 ppm; STEL 6.0 ppm ACGIH TLV-TWA 3.0 ppm; STEL 6.0 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Ammonia-like odor

Boiling Point (degrees C):

170.5 (339 F)

Melting/Freezing Point (degrees C):

10.5 (51 F)

Specific Gravity (water=1):

1.02

pH:

11.8

Vapor Pressure:

.2 mmHg at 20 C (68 F)

Viscosity:

23.6 cSt at 20 C (68 F)

VOC Content:

98% by ASTM D 2369

Vapor Density (Air=1):

2.1

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others X None of these

Comments:

This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 1.00 - 2.00 g/kg (rat) moderately toxic
Inhalation:
Not determined.
Dermal:
LD50 > 1.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

Prolonged and repeated ingestion of monoethanolamine has caused kidney and liver damage in laboratory animals. In addition, a developmental toxicity study, using unconventional statistical treatment of the data, demonstrated developmental toxicity in rats. The true signifigance of the study data is not clear, since a full re-interpretation of this data is not possible at this time. Additional or repeat studies are planned or underway to better define the toxic potential of this product, or to verify the results obtained from previous animal studies.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethanolamine

Hazard Class:
8

Identification Number:
UN 2491

Packing Group:
III

Label Required:
Corrosive

IMDG

Proper Shipping Name:
Ethanolamine

Hazard Class
8

Identification Number
UN 2491

Packing Group
III

Label Required
Corrosive

ICAO

MSDS CODE AND NAME	:	*MEA MONOETHANOLAMINE, MEA*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Proper Shipping Name:
Ethanolamine

Hazard Class
8

Identification Number
UN 2491

Packing Group
III

Label Required
Corrosive

TDG

Proper Shipping Name:
Ethanolamine

Hazard Class:
8

Identification Number:
UN 2491

Label Required:
Corrosive

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2-amino-	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

MSDS CODE AND NAME	:	*MEA MONOETHANOLAMINE, MEA*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class E: Corrosive

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 100.00 - 1000.00 ppm practically non-toxic

Mobility:

This product is expected to be mobile in soil and not be expected to adsorb to suspended solids or sediments in water.

Persistence and Biodegradability:

This product undergoes moderate biodegradation and is not expected to be persistent in the environment.

Potential to Bioaccumulate:

This product is not expected to bioaccumulate. K_{ow} = -1.31

Remarks:

None

16. OTHER INFORMATION 7/1/2004

None

Date Issued: 7/1/2004.

MSDS CODE AND NAME	:	*MEA MONOETHANOLAMINE, MEA*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004
COMPANY	:	HUNTSMAN

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*MEALC MONOETHANOLAMINE LCI*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

MEALC MONOETHANOLAMINE LCI

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2-amino-	141-43-5	3 ppm TWA-OSHA 6 ppm STEL-OSHA 6 ppm STEL-ACGIH 3 ppm TWA-ACGIH	100

MSDS CODE AND NAME	:	*MEALC MONOETHANOLAMINE LCI*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

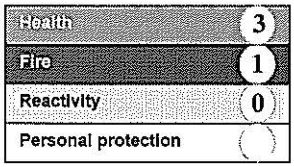
Odor:

Ammonia-like odor

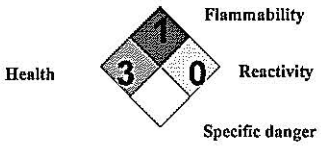
WARNING STATEMENT

DANGER ! CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
MAY CAUSE DIZZINESS AND DROWSINESS
MAY CAUSE LIVER AND KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

MSDS CODE AND NAME	:	*MEALC MONOETHANOLAMINE LCI*
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COMPANY	:	*HUNTSMAN*

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

95.5 (204 F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 5
Upper: 17

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

MSDS CODE AND NAME	:	*MEALC MONOETHANOLAMINE LCI*
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DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Monoethanolamine (ethanolamine): OSHA PEL-TWA 3.0 ppm; STEL 6.0 ppm ACGIH TLV-TWA 3.0 ppm; STEL 6.0 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Ammonia-like odor

Boiling Point (degrees C):

170.5 (339 F)

Melting/Freezing Point (degrees C):

10.5 (51 F)

Specific Gravity (water=1):

1.02

pH:

11.8

Vapor Pressure:

.2 mmHg at 20 C (68 F)

Viscosity:

23.6 cSt at 20 C (68 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

2.1

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others X None of these

Comments:

This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 1.00 - 2.00 g/kg (rat) moderately toxic
Inhalation:
Not determined.
Dermal:
LD50 > 1.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

Prolonged and repeated ingestion of monoethanolamine has caused kidney and liver damage in laboratory animals. In addition, a developmental toxicity study, using unconventional statistical treatment of the data, demonstrated developmental toxicity in rats. The true signifigance of the study data is not clear, since a full re-interpretation of this data is not possible at this time. Additional or repeat studies are planned or underway to better define the toxic potential of this product, or to verify the results obtained from previous animal studies.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethanolamine

Hazard Class:
8

Identification Number:
UN 2491

Packing Group:
III

Label Required:
Corrosive

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Ethanolamine

Hazard Class:
8

Identification Number:
UN 2491

MSDS CODE AND NAME	:	*MEALC MONOETHANOLAMINE LCI*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Label Required:
Corrosive

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2-amino-	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class E: Corrosive

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	:	*MEALC MONOETHANOLAMINE LCI*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 100.00 - 1000.00 ppm practically non-toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

None

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

MEANF MONOETHANOLAMINE NF

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2-amino-	141-43-5	6 ppm STEL-ACGIH 3 ppm TWA-OSHA 6 ppm STEL-OSHA 3 ppm TWA-ACGIH	100

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

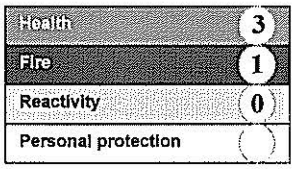
Odor:

Ammonia-like odor

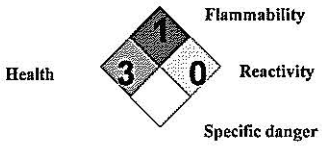
WARNING STATEMENT

DANGER ! CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
MAY CAUSE DIZZINESS AND DROWSINESS
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
MAY CAUSE LIVER AND KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

95.5 (204 F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 5
Upper: 17

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
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COMPANY	:	*HUNTSMAN*

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Monoethanolamine (ethanolamine): OSHA PEL-TWA 3.0 ppm; STEL 6.0 ppm ACGIH TLV-TWA 3.0 ppm; STEL 6.0 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Ammonia-like odor

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Boiling Point (degrees C):

170.5 (339 F)

Melting/Freezing Point (degrees C):

10.5 (51 F)

Specific Gravity (water=1):

1.02

pH:

11.8

Vapor Pressure:

.2 mmHg at 20 C (68 F)

Viscosity:

23.6 cSt at 20 C (68 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

2.1

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others X None of these

Comments:

This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 1.00 - 2.00 g/kg (rat) moderately toxic
Inhalation:
Not determined.
Dermal:
LD50 > 1.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

Prolonged and repeated ingestion of monoethanolamine has caused kidney and liver damage in laboratory animals. In addition, a developmental toxicity study, using unconventional statistical treatment of the data, demonstrated developmental toxicity in rats. The true signifigance of the study data is not clear, since a full re-interpretation of this data is not possible at this time. Additional or repeat studies are planned or underway to better define the toxic potential of this product, or to verify the results obtained from previous animal studies.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethanolamine

Hazard Class:
8

Identification Number:
UN 2491

Packing Group:
III

Label Required:
Corrosive

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Ethanolamine

Hazard Class:
8

Identification Number:
UN 2491

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Label Required:
Corrosive

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2-amino-	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class E: Corrosive

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

MSDS CODE AND NAME	:	*MEANF MONOETHANOLAMINE NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 100.00 - 1000.00 ppm practically non-toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

None

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*MORPH MORPHOLINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

MORPH MORPHOLINE

Chemical Name and/or Family or Description:

Morpholine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Morpholine	110-91-8	20 ppm TWA-OSHA (SKIN) 30 ppm STEL-OSHA 20 ppm TWA-ACGIH (SKIN)	>99.0

MSDS CODE AND NAME	:	*MORPH MORPHOLINE*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

Odor:

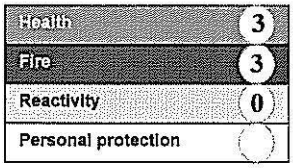
Ammonia-like odor

WARNING STATEMENT

DANGER !

FLAMMABLE LIQUID AND VAPOR
CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
HARMFUL IF ABSORBED THROUGH SKIN
DO NOT ADD NITRITES -
MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: In addition to the potential skin irritation effects noted above, skin contact may result in other adverse health effects. Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Although there has been secondary (anecdotal) reports of the potential for morpholine to be a dermal sensitizer in humans, the weight of the available scientific information indicates that morpholine is not expected to be a dermal sensitizer based on animal and human skin patch testing data.

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease.

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

310 (590 F)

Flash Point (degrees C):

35 (95 F) (TCC)

Flammable Limits % (Lower-Upper):

Lower: 1.8
Upper: 10.8

Recommended Fire Extinguishing Agents And Special Procedures:

Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, alcohol resistant foam or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Flammable materials may release vapors that travel long distances, ignite and flash back. Containers may explode in a fire. Do not exposeto heat, sparks, flame, or other sources of ignition. When handling, use non-sparking tools, ground and bond all containers.

Special Protective Equipment for Firefighters:

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Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

Morpholine: OSHA PEL-TWA 20 ppm; STEL 30 ppm (SKIN) ACGIH TLV-TWA 20 ppm (SKIN)

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DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Ammonia-like odor

Boiling Point (degrees C):

128.3 (263 F)

Melting/Freezing Point (degrees C):

-5 (23 F)

Specific Gravity (water=1):

1.0017

pH:

11.2

Vapor Pressure:

7 mmHg at 20 C (68 F)

Viscosity:

2.2 cSt at 20 C (68 F)

VOC Content:

100% by ASTM D 2369

Vapor Density (Air=1):

3

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others** X **None of these**

Comments:

Do not add or formulate with nitrites. See Section 16, OTHER INFORMATION. This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

MSDS CODE AND NAME	:	*MORPH MORPHOLINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 1.05 g/kg (rat) moderately toxic
Inhalation:
Believed to be practically non-toxic
Dermal:
LD50 1.21 g/kg (rabbit) moderately toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Although there has been secondary (anecdotal) reports of the potential for morpholine to be a dermal sensitizer in humans, the weight of the available scientific information indicates that morpholine is not expected to be a dermal sensitizer based on animal and human skin patch testing data.

Other:

Prolonged and repeated exposure to morpholine vapors causes ocular, nasal, and skin irritation in laboratory animals. Prolonged and repeated inhalation of morpholine vapors did not cause cancer or organ damage in rats exposed for up to 2 years.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Morpholine

Hazard Class:
8(3)

Identification Number:
UN 2054

Packing Group:
I (See Section 16 of MSDS for additional information on the Packing Group designation for morpholine.)

Label Required:
Corrosive, flammable liquid

IMDG

Proper Shipping Name:

Morpholine

Hazard Class:
8(3)

Identification Number:
UN 2054

Packing Group:
I (See Section 16 of MSDS for additional information on the Packing Group designation for morpholine.)

Label Required:
Corrosive, flammable liquid

ICAO

Proper Shipping Name:
Morpholine

Hazard Class:
8(3)

Identification Number:
UN 2054

Packing Group:
I (See Section 16 of MSDS for additional information on the Packing Group designation for morpholine.)

Label Required:
Corrosive, flammable liquid

TDG

Proper Shipping Name:
Morpholine

Hazard Class:
8(3)

Identification Number:
UN 2054

Label Required:
Corrosive, flammable liquid

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute X **Chronic** X **Fire** X **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ

None.

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Morpholine	CT, FL, IL, MA, NJ, PA, RI
Ethylene glycol monomethyl ether	FL, MA, MN, NJ, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Ethylene glycol monomethyl ether	109-86-4

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 1, Subdiv B: Toxic Class B, Div 2: Flammable liquid Class E: Corrosive

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 100.00 - 1000.00 ppm practically non-toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Expected to slowly biodegrade in the environment.

Potential to Bioaccumulate:

Not expected to bioaccumulate (log K_{ow} = -0.84 (pH 10) to -2.55 (pH 7)).

Remarks:

None

MSDS CODE AND NAME	:	*MORPH MORPHOLINE*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

16. OTHER INFORMATION 7/1/2004

Please note: Huntsman has recently sponsored DOT/UN dermal corrosivity studies using morpholine which indicate that morpholine should be reclassified as a Packing Group I dermal corrosive. On the basis of these studies, Huntsman petitioned the DOT/UN for a change in the Hazardous Materials Table entry for morpholine, from Packing Group III flammable liquid to Packing Group I corrosive liquid with a subsidiary hazard of flammability. The DOT, ICAO & IMDG are changing the classification of morpholine in the 2001 regulations and these changes are in Section 13.

"SKIN" notation in Section 2 indicates possible adverse health effects as a result of absorption through the skin, mucous membranes and eyes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	***C4RAFF MTBE C4 RAFFINATE***
DATE ISSUED	:	**2/18/2005**
DATE PRINTED	:	**2/18/2005**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

C4RAFF MTBE C4 RAFFINATE

Chemical Name and/or Family or Description:

Aliphatic hydrocarbon mixture

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA X **IARC** X **NTP** X **OTHER** X **NONE**

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
1-butene (contains other n-butene isomers in unknown proportion)	25167-67-3		35.00-49.99
Isobutane	75-28-5		35.00-49.99
Butane	106-97-8	800 ppm TWA-OSHA 800 ppm TWA-ACGIH	10.00-19.99
C3 hydrocarbons	68606-26-8	1000 ppm TWA-OSHA (PROPANE/PROPYNE) 1000 ppm TWA-ACGIH (PROPYNE)	3.00-9.99
C5 hydrocarbons	68476-55-1		3.00-9.99
Butadiene, 1,3-	106-99-0	1 ppm TWA-OSHA 5 ppm STEL-OSHA 2 ppm TWA-ACGIH-(A2)	0.01-0.99

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COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

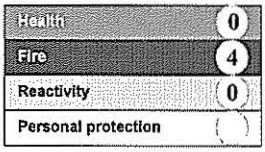
Odor:

Sweet odor

WARNING STATEMENT

DANGER !	FLAMMABLE GAS - MAY CAUSE FLASH FIRE LIQUID MAY CAUSE FROSTBITE MAY CAUSE DIZZINESS AND DROWSINESS GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
ATTENTION:	CONTAINS 1,3-BUTADIENE - MAY CAUSE CANCER BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes:	Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).
Skin:	Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).
Inhalation:	Gas may cause irritation of the nose and throat, headache, nausea, and drowsiness. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result.
Ingestion:	Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).
Sensitization Properties:	Unknown

Chronic:

An epidemiology study conducted at the former Texaco Chemical Company 1,3-Butadiene manufacturing facility (subsequently acquired by the Huntsman Corporation) and updated through 1990 showed that the workers had a lower overall death rate than the general U.S. population. There was a two-fold increase in mortality from lymphosarcoma and reticulum cell sarcoma. However, the increase was not consistently seen in all job groups potentially exposed to higher levels of 1,3-Butadiene. In addition, the increase was seen primarily in short term workers whose employment began during World War II and not in those employed ten years or more.

This pattern of results suggests that exposure to 1,3-Butadiene was not responsible for the increase lymphosarcomas. This study has now been updated through 1994. Preliminary findings from this most recent update indicate that the overall death rate and the death rate due to cancer among employees who worked at the plant from 1942 to 1994 continue to be lower than expected. A slight increase in the number of deaths from cancers of other lymphatic tissues among long term employees was observed. These deaths involved employees hired prior to 1950. Numerous control measures have been incorporated into the facility since that time, thereby significantly reducing workplace exposures. A thorough review of these findings is currently underway.

Several other studies involving workers manufacturing Styrene-Butadiene rubber have shown increases of leukemia and lymphomas. These workers were potentially exposed to 1,3-Butadiene and other chemicals, especially styrene and possibly benzene. Due to the presence of multiple chemicals and inconsistent results, these studies do not demonstrate 1,3-Butadiene exposure to be responsible for increased leukemia or lymphoma in these workers.

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Additional information concerning 1,3-Butadiene toxicity in experimental animals is located in Section 11 (Toxicological Information).

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Overexposure to this material may sensitize the heart to catecholamine- induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

315.5 (600 F)

Flash Point (degrees C):

-78.7 (-110 F)

Flammable Limits % (Lower-Upper):

Lower: 1.9
Upper: 8.5

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Readily forms explosive air-vapor mixtures; may release explosive vapors that travel, be ignited at remote locations, and flash back. Containers may explode in fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

No special equipment or procedures required.

MSDS CODE AND NAME	:	***C4RAFF MTBE C4 RAFFINATE***
DATE ISSUED	:	**2/18/2005**
DATE PRINTED	:	**2/18/2005**
COMPANY	:	**HUNTSMAN**

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Sweet odor

Boiling Point (degrees C):

-12.2 (10 F)

Melting/Freezing Point (degrees C):

Not applicable.

Specific Gravity (water=1):

.585

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pH:

Not applicable.

Vapor Pressure:

1520 mmHg at 20 C (68 F)

Viscosity:

Not determined.

VOC Content:

Not Determined

Vapor Density (Air=1):

2

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

See "Other Information", Section 16 for Toxicological Data regarding 1,3-butadiene.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

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Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Liquified Petroleum Gas

Hazard Class:
2.1

Identification Number:
UN 1075

Packing Group:

Label Required:
Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute Chronic Fire X **Pressure** X **Reactive N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Butadiene, 1,3-	106-99-0	0.01-0.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Butadiene, 1,3-	106-99-0	0.01-0.99	10

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COMPANY	:	**HUNTSMAN**

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Butadiene, 1,3-	FL, IL, MA, NJ, PA, RI, MI
1-butene (contains other n-butene isomers in unknown proportion)	NJ, RI
Butane	IL, MA, NJ, PA, RI
Isobutane	MA, NJ, PA

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

Not determined

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 2/18/2005

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Prolonged and repeated inhalation of 1,3-butadiene has produced tumors in multiple sites in rats and mice. In Sprague-Dawley rats exposed to 1000 or 8000 ppm butadiene, tumor sites have included the mammary gland, thyroid, and testes. The National Toxicology Program concluded there was "clear evidence" of carcinogenicity in B6C3F1 mice exposed to 6.25 ppm to 1250 ppm butadiene. This was based on increased tumors in the hematopoietic system, heart, lung, forestomach, liver and harderian gland in males and females, preputial gland, brain, and kidney (males), and in ovary and mammary gland (females). IARC has concluded that there is sufficient evidence for 1,3-butadiene carcinogenicity in experimental animals.

Repeated exposure to 1,3-butadiene has produced genetic toxicity, bone marrow toxicity, and anemia in the mouse. Noncarcinogenic

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damage to the ovary, testes, liver, nasal tissue, and forestomach have also been observed in the mouse, and evidence of kidney damage has been observed in the rat. Exposure of pregnant rodents to maternally toxic 1,3-butadiene concentrations has affected the developing fetus. Malformations (birth defects) have been reported in the developing fetus of pregnant rats exposed to 8000 ppm 1,3-butadiene. There was no evidence of teratogenic effects in a second developmental study in the rat or a developmental study in the mouse, both involving butadiene exposures up to 1000 ppm.

The B6C3F1 mouse has been demonstrated to be substantially more susceptible to toxic and carcinogenic responses to 1,3-butadiene exposure than the Sprague-Dawley rat. Repeated exposure to 6.25 ppm 1,3-butadiene has produced lung tumors and ovarian atrophy in females, and evidence of genetic toxicity in males and females of this mouse strain. By contrast, evidence for toxic and carcinogenic responses in the rat is more limited and has been observed primarily following prolonged exposure to 1,3-butadiene concentrations of 1000 ppm or higher.

In an effort to explain the higher toxic and carcinogenic potency of 1,3-butadiene in the mouse and evaluate the relevance of these animal bioassay results to humans, pharmacokinetic and metabolism studies have been conducted using rodents, monkeys, and tissues from rodents and humans. The results of these studies suggest that the mouse may not be an appropriate model from which to predict human health effects from exposure to 1,3-butadiene.

See Section 3 (Hazard Identification) for additional health effects information for 1,3-butadiene.

Supercedes: 7/1/2004 **The following sections have been revised: 2, 3, 11, 14, 16**

Date Issued: 2/18/2005.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	***MTBETC MTBE - HIF***
DATE ISSUED	:	**10/20/2005**
DATE PRINTED	:	**10/20/2005**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

MTBETC MTBE - HIF

Chemical Name and/or Family or Description:

Fuel additive - oxygenate

COMPANY INFORMATION

Huntsman International Fuels, L.P.
PO Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Propane, 2-methoxy-2-methyl-	1634-04-4	40 ppm TWA-ACGIH (A3)	95.00 - 99.99
Acetone	67-64-1	750 ppm TWA-OSHA 500 ppm TWA-ACGIH (A4) 750 ppm STEL-ACGIH	1.00 - 2.99
Tert-butyl alcohol	75-65-0	100 ppm TWA-OSHA 100 ppm TWA-ACGIH (A4)	1.00 - 2.99

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3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear, colorless liquid

Odor:

Petroleum

WARNING STATEMENT

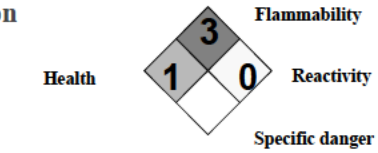
DANGER !

EXTREMELY FLAMMABLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MAY CAUSE EYE IRRITATION
MAY CAUSE DIZZINESS AND DROWSINESS
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE

Hazardous Material Information System (United States)

Health	1
Fire	3
Reactivity	0
Personal protection	

National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition).

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

435 (815°F)

Flash Point (degrees C):

-42 (-43.6°F) (TCC)

Flammable Limits % (Lower-Upper):

Lower: 0.9
Upper: 9.5

Recommended Fire Extinguishing Agents And Special Procedures:

Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, alcohol resistant foam or carbon dioxide to extinguish fire.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Explosive air-vapor mixtures may form.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

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6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Use vapor stabilization foam to blanket spill. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear, colorless liquid

Odor:

Petroleum

Boiling Point (degrees C):

55 (131°F)

Melting/Freezing Point (degrees C):

-108.7 (-164°F)

Specific Gravity (water=1):

0.74

pH:

Not applicable.

Vapor Pressure:

200 mmHg at 20°C (68°F)

Viscosity:

0.5 cSt at 20°C (68°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

3.1

Solubility in Water (%):

5 [Partially soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat__X__ Strong Oxidizers__X__ Others____ None of these____

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Similar product 3.80 g/kg (rat) slightly toxic
Inhalation:
4 hr. LC50 Similar product 23500.00 ppm (gas, vapor) (rat) practically non-toxic
Dermal:
LD50 Similar product 10.20 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Similar product 20.80 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

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Other:

In male mice, prolonged and repeated exposure to high levels of MTBE vapor produced a higher than expected mortality due to urinary tract obstruction believed caused by physical non-neoplastic blockage of the urethral canal. In female mice, data indicate increased incidence of hepatocellular adenomas (benign liver tumors).
Prolonged and repeated exposure to high levels of MTBE (up to 8000 ppm for over 15 months) resulted in excess mortality (82%) in male rats. Preliminary evaluation showed a chronic progressive nephrosis (kidney damage) as the possible cause of death.
Associated with the increased severity of nephropathy was an increase in the number of renal tubular cell adenomas (benign kidney tumors) and carcinomas (malignant kidney tumors). There was also a difference in the number of testicular interstitial cell adenomas (benign testicular tumors). MTBE has been shown to cause embryo/fetal toxicity and birth defects in mice, but only at maternally toxic doses. No developmental effects were seen in rabbits at the same exposure levels. Although the significance of these findings to humans is unclear, workers should minimize exposure to MTBE vapor.

Long-term exposure of rats and mice to high levels of t-butyl alcohol in drinking water resulted in an increased incidence of kidney tumors in male rats. This tumor response may be associated with a mechanism distinct to rodents. Male mice experienced a marginal increase in thyroid gland tumors; however, there was no dose response. In female rats there was an increased incidence of thyroid gland tumors at the highest dose level. Because the significance of these tumor findings to humans is unclear at this time, workers should minimize exposure to t-butyl alcohol.

Additional or repeat studies are planned or underway to better define the toxic potential of this product, or to verify the results obtained from previous animal studies.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Methyl-tert-butyl ether

Hazard Class:
3

Identification Number:
UN2398

Packing Group:
II

Label Required:
FLAMMABLE LIQUID

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not determined.

ICAO

Proper Shipping Name:
Not determined.

MSDS CODE AND NAME	:	***MTBETC MTBE - HIF***
DATE ISSUED	:	**10/20/2005**
DATE PRINTED	:	**10/20/2005**
COMPANY	:	**HUNTSMAN**

TDG

Proper Shipping Name:
Not determined.

Hazard Class:
Not determined.

Identification Number:
Not determined.

Label Required:
Not determined.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire__X__ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Methyl-t-butyl ether	1634-04-4	95.00 - 99.99
Tert-butyl alcohol	75-65-0	1.00 - 2.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Methyl-t-butyl ether	1634-04-4	95.00 - 99.99	1000
Acetone	67-64-1	1.00 - 2.99	5000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Methyl-t-butyl ether	IL, MA, NJ, PA

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

California Drinking Water Standard:

The California Department of Health Services (DHS) has established drinking water standards for the presence of MTBE in drinking water. DHS has established a primary drinking water standard for MTBE of 0.013 micrograms per liter (mcg/L) or 13 parts per billion (ppb). This primary standard has been established by the State of California to protect against potential adverse health effects from ingesting MTBE in drinking water. DHS has also established a secondary standard of 0.005 mcg/L or 5 ppb, to maintain drinking water quality with regard to taste and odor.

INTERNATIONAL REGULATIONS:

Export Notification (TSCA-12b): This product may be subject to export notification under TSCA section 12(b); contains: Methyl-t-butyl ether

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

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DATE ISSUED	:	**10/20/2005**
DATE PRINTED	:	**10/20/2005**
COMPANY	:	**HUNTSMAN**

WHMIS Classification:

Class B, Div 2: Flammable liquid
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr > 100.00 mg/liter (fish) practically nontoxic
EC50-48hr > 100.00 mg/liter (Daphnia magna) practically nontoxic
LC50-96hr > 100.00 mg/liter (algae) practically nontoxic

Mobility:

This product is soluble in water and is expected to be mobile in soils and not expected to adsorb to suspended solids or sediments in water.

Persistence and Biodegradability:

This product is estimated to have a very low rate of biodegradation.

Potential to Bioaccumulate:

MTBE is not expected to bioaccumulate (log K_{ow} = 1.2).

Remarks:

MTBE is used as a component chemical (oxygenate) in certain gasoline formulations. As a result of leaking underground gasoline storage tanks and careless handling of gasoline in the environment, MTBE has been found in some groundwater sources of drinking water.

Studies using human volunteers have shown that MTBE can affect the palatability of drinking water, imparting a noticeable taste and odor at relatively low concentrations. The results of several recent studies, investigating the odor threshold for MTBE in water, have demonstrated a range of average detection thresholds from 15 to 95 micrograms per liter (mcg/L). Other studies, investigating the taste threshold for MTBE in water, have demonstrated a range of average detection thresholds from 24 to 149 mcg/L. It should be recognized that these studies have determined the average detection thresholds for MTBE in water, and the ability to taste or smell low level MTBE concentrations in drinking water will vary among individuals in the population.

16. OTHER INFORMATION 10/20/2005

None

Supercedes: 7/1/2004

The following sections have been revised: 1, 2

Date Issued: 10/20/2005.

MSDS CODE AND NAME	**:**	***MTBETC MTBE - HIF***
DATE ISSUED	**:**	**10/20/2005**
DATE PRINTED	**:**	**10/20/2005**
COMPANY	**:**	**HUNTSMAN**

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TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. Box 4980
THE WOODLANDS, TX 77387-4980

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HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*NBUTANE NORMAL BUTANE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

NBUTANE NORMAL BUTANE

Chemical Name and/or Family or Description:

Aliphatic Hydrocarbon

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Butane,normal	106-97-8	800 ppm TWA-OSHA 800 ppm TWA-ACGIH	100

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
DATE ISSUED	: *7/1/2004*	
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COMPANY	: *HUNTSMAN*	

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Gas

Odor:

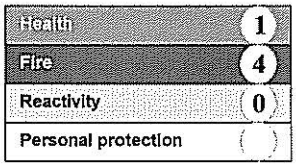
Not determined

WARNING STATEMENT

DANGER !

FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
DATE ISSUED	: *7/1/2004*	
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COMPANY	: *HUNTSMAN*	

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Overexposure to this material may sensitize the heart to catecholamine- induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information. This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

287.8 (550 F)

Flash Point (degrees C):

-60 (-76 F)

Flammable Limits % (Lower-Upper):

Lower: 1.8
Upper: 8.4

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Readily forms explosive air-vapor mixtures; may release explosive vapors that travel, be ignited at remote locations, and flash back. Containers may explode in fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Butane: OSHA PEL-TWA 800 ppm; ACGIH TLV-TWA 800 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Gas

Odor:

Not determined

Boiling Point (degrees C):

.5 (33 F)

Melting/Freezing Point (degrees C):

-137.6 (-216 F)

Specific Gravity (water=1):

.5844

pH:

Not applicable.

Vapor Pressure:

> 760 mmHg at 20 C (68 F)

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
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COMPANY	: HUNTSMAN	

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

2.1

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Not applicable; material is a gas.
Inhalation:
Believed to be practically non-toxic
Dermal:
Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

None

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class:
2.1

Identification Number:
UN 1075

Packing Group:

Label Required:
Flammable gas

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

None.

Section 311 Hazardous Categorization:
Acute X **Chronic** **Fire** X **Pressure** X **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Butane,normal	IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not applicable

Persistence and Biodegradability:

Not applicable.

MSDS CODE AND NAME	: *NBUTANE*	*NORMAL BUTANE*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

Potential to Bioaccumulate:

Not applicable.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Dispose of as a vapor, venting at a safe location, keeping gas below explosive limit (LEL).

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

2920 Rev. 1/1/96

690 Page 1

TRANS CHEM, INC.

MATERIAL SAFETY DATA SHEET

**********PRODUCT IDENTIFICATION**********
PHOSPHORIC ACID

SUPPLIER:
TRANS CHEM, INC.
CHEMICAL NAMES AND SYNONYMS:
PHOSPHORIC ACID, (C.A.S. 7664-38-2)
USE OR DESCRIPTION:
INORGANIZ FERTILIZER, WASTE WATER TREATMENT

TRANSPORT EMERGENCY TELEPHONE:
(800) 424-9300 (CHEMTREC)

********** TYPICAL CHEMICAL AND PHYSICAL PROPERTIES **********

APPEARANCE:
PALE GREEN LIQUID
ODOR:
ODORLESS
RELATIVE DENSITY: 15/4 C
1.37
MELTING POINT: F(C)
NA
BOILING POINT: F(C)
148°C
VAPOR PRESSURE: MM HG 20C
Negligable

VISCOSITY: AT 100 F. SUS AT 40 C. CS
)238.0)51.2
VISCOSITY: AT 210 F. SUS AT 100 C, CS
NE NE
SOLUBILITY IN WATER: PH:
COMPLETE NE
POUR POINT: F (C)
NE
FLASH POINT: F(C) (METHOD)
NA

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
****

INGREDIENTS

	WT PCT (APPROX)	TLV(TWA)	MG/M3	PPM
HAZARDOUS INGREDIENTS:				
PHOSPHORIC ACID (7664-38-2)	50			
SULFURIC ACID (7664-93-9)	3			
NON-HAZARDOUS INGREDIENTS:				

NOTE: TLVS SHOWN FOR GUIDANCE ONLY. FOLLOW APPLICABLE REGULATIONS.

INFORMATION GIVEN HEREIN IS OFFERED IN GOOD FAITH AS ACCURATE, BUT WITHOUT GUARANTEE. CONDITIONS OF USE AND SUITABILITY OF THE PRODUCT FOR PARTICULAR USES ARE BEYOND OUR CONTROL; ALL RISKS OF USE OF THE PRODUCT ARE THEREFORE ASSUMED BY THE USER AND WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. NOTHING IS INTENDED AS A RECOMMENDATION FOR USES WHICH INFRINGE VALID PATENTS OR AS EXTENDING LICENSE UNDER VALID PATENTS APPROPRIATE WARNINGS AND SAFE HANDLING

********** FIRE AND EXPLOSION HAZARD DATA **********

FLASH POINT: F(C) (METHOD) FLAMMABLE LIMITS: LEL UEL
NA NA NA

EXTINGUISHING MEDIA:
NOT APPLICABLE

SPECIAL FIRE FIGHTING PROCEDURES:
FIREFIGHTERS MUST USE RECOMMENDED PROTECTIVE EQUIPMENT. THE MATERIAL WILL NOT BURN.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
NONE KNOWN

********** EMERGENCY AND FIRST AID PROCEDURES **********

EYE CONTACT:
FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. GET IMMEDIATE MEDICAL ASSISTANCE. IF MEDICAL ASSISTANCE IS NOT IMMEDIATELY AVAILABLE, FLUSH AN ADDITIONAL 15 MINUTES.

SKIN CONTACT:
WASH CONTACT AREAS WITH SOAP AND WATER.

INHALATION:
REMOVE FROM FURTHER EXPOSURE. IF UNCONSCIOUSNESS OCCURS, SEEK IMMEDIATE MEDICAL ASSISTANCE AND CALL A PHYSICIAN. IF BREATHING HAS STOPPED, USE MOUTH TO MOUTH RESUSCITATION.

INGESTION:
IF SWALLOWED, IMMEDIATELY GIVE 1 TO 2 GLASSES OF WATER AND CALL A PHYSICIAN, HOSPITAL EMERGENCY ROOM OR POISON CONTROL CENTER FOR ASSISTANCE. DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

********** REACTIVITY DATA **********

STABILITY: (THERMAL, LIGHT, ETC.) CONDITIONS TO AVOID:
STABLE REACTION OF THE MATERIAL WITH ACTIVE METALS (IE, AL, ZN, FE, ETC.) CAN LIBERATE HYDROGEN.

INCOMPATIBILITY: (MATERIALS TO AVOID)
ACTIVE METALS

HAZARDOUS DECOMPOSITION PRODUCTS:
PHOSPHORUS OXIDES.

HAZARDOUS POLYMERIZATION: CONDITIONS TO AVOID:
WILL NOT OCCUR NOT APPLICABLE

********** SPILL OR LEAK PROCEDURE **********

ENVIRONMENTAL IMPACT:

REPORT SPILLS AS REQUIRED TO APPROPRIATE AUTHORITIES. U.S. COAST GUARD REGULATIONS REQUIRE IMMEDIATE REPORTING OF SPILLS THAT COULD REACH ANY WATERWAY INCLUDING INTERMITTENT DRY CREEKS. REPORT SPILL TO COAST GUARD TOLL FREE NUMBER 800-424-8802. IN CASE OF ACCIDENT OR ROAD SPILL NOTIFY CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

PERSONNEL PERFORMING CLEANUP MUST USE PROTECTIVE EQUIPMENT. SPRINKLE HYDRATED LIME OR SODA ASH ON SPILL AREA. SCRAPE UP AND REMOVE. DISPOSE OF AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

WASTE MANAGEMENT:

SLOWLY ADD WASTE TO A LARGE VOLUME OF AGITATED SOLTUION OF SODA ASH AND SLAKED LIME. DISPOSE OF WASTE AT AN APPROPRIATE WASTE DISPOSAL FACILITY IN ACCORDANCE WITH CURRENT APPLICABLE LAWS AND REGULATIONS, AND PRODUCT CHARACTERISTICS AT TIME OF DISPOSAL.

********** SPECIAL PROTECTION INFORMATION **********

EYE PROTECTION:

CHEMICAL TYPE GOGGLES MUST BE WORN.

SKIN PROTECTION:

NO SPECIAL EQUIPMENT REQUIRED. HOWEVER, GOOD PERONAL HYGIENE PRACTICES SHOULD ALWAYS BE FOLLOWED.

RESPIRATORY PROTECTION:

NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION. APPROVED RESPIRATORY PROTECTIVE EQUIPMENT MUST BE USED IN HIGH VAPOR OR MIST CONCENTRATIONS.

VENTILATION:

NO SPECIAL REQUIREMENTS UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.

OTHER: PRIMARY ROUTE OF ENTRY - SKIN CONTACT

********** SPECIAL PRECAUTIONS **********

HANDLING: AVOID CONTACT WITH EYES. AVOID INHALATION OF VAPORS OR MISTS.

STORAGE: SEE APPENDIX FOR PRECAUTIONARY LABEL. ICG-690

STORED MATERIALS MUST BE LABELED AS: CAUSES EYE BURNS.

********** HEALTH HAZARD DATA **********

ACUTE HEALTH HAZARDS
EYE AND RESPIRATORY IRRITANT

CARCINOGENICITY
LISTED: NTP NO IARC MONOGRAPHS NO OSHA REGULATED NO

SIGNS AND SYMPTOMS OF EXPOSURE:
RESPIRATORY, EYE AND/OR SKIN IRRITATION

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
NONE KNOWN

SUBACUTE AND MUTAGENICITY (SUMMARY)

NE

CHRONIC OR SPECIALIZED (SUMMARY)

NE

TARGET ORGAN EFFECTS

CORROSIVE TO TISSUES WITH WHICH IT MAKES CONTACT:

OTHER DATA

NONE KNOWN

4753

NALCO

MATERIAL SAFETY DATA SHEET

PRODUCT

PP02-3816

EMERGENCY TELEPHONE NUMBER
(800)462-5378 (24 Hours) (800) I-M-ALERT

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **PP02-3816**

APPLICATION : PAPER PROCESS

CHEMICAL DESCRIPTION : Hydrocarbon solvent

COMPANY IDENTIFICATION : Nalco Chemical Company
One Nalco Center
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER : (800)462-5378 (24 Hours) (800) I-M-ALERT

NFPA 704M/HMIS RATING
HEALTH : 1 / 1 FLAMMABILITY : 1 / 1 REACTIVITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Severely Hydrotreated Heavy Naphthenic Distillate	64742-52-5	60.0 - 100.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Avoid breathing vapor. Use with adequate ventilation. Do not take internally. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap and water.
Wear suitable protective clothing, gloves and eye/face protection.
Low Fire Hazard; liquids may burn upon heating to temperatures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. Can cause chemical pneumonia if aspirated into lungs following ingestion.

INHALATION :
Repeated or prolonged exposure may irritate the respiratory tract.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
Frequent or prolonged contact with product may defat and dry the skin, leading to discomfort and dermatitis.

AGGRAVATION OF EXISTING CONDITIONS :
Skin contact may aggravate an existing dermatitis condition.

4. FIRST AID MEASURES

EYE CONTACT :
Immediately flush with plenty of water for at least 15 minutes. If symptoms develop, seek medical advice.

SKIN CONTACT :
Immediately wash with plenty of soap and water. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting: contains petroleum distillates and/or aromatic solvents. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :
Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT :	> 250 °F / > 121 °C (PMCC)
LOWER EXPLOSION LIMIT :	Not flammable
UPPER EXPLOSION LIMIT :	Not flammable
AUTOIGNITION TEMPERATURE :	> 400 °F / > 204 °C

EXTINGUISHING MEDIA :
Alcohol foam, Carbon dioxide, Foam, Dry powder, Other extinguishing agent suitable for Class B fires, For large fires, use water spray or fog, thoroughly drenching the burning material.
Water mist may be used to cool closed containers.

UNSUITABLE EXTINGUISHING MEDIA :
Do not use water unless flooding amounts are available.

FIRE AND EXPLOSION HAZARD :
Low Fire Hazard; liquids may burn upon heating to temperatures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible. Do not touch spilled material. Remove sources of ignition. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by dyking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Use with adequate ventilation. Keep the containers closed when not in use. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :
Store away from heat and sources of ignition. Store separately from oxidizers. Store the containers tightly closed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

ACGIH/TLV :
Substance(s)
Oil Mist TWA: 5 mg/m3

OSHA/PEL :
Substance(s)
Oil Mist TWA: 5 mg/m3

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
If significant mists, vapors or aerosols are generated an approved respirator is recommended. An organic vapor cartridge with dust/mist prefilter or supplied air may be used.

HAND PROTECTION :
Nitrile gloves, PVC gloves, Viton gloves

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Tan Opaque
ODOR	Hydrocarbon

SPECIFIC GRAVITY	0.9 @ 80 °F / 27 °C
DENSITY	7.47 lb/gal
SOLUBILITY IN WATER	Emulsifiable
BOILING POINT	> 200 °F / > 93 °C
EVAPORATION RATE	< 1 (BuAc = 1)

NALCO

MATERIAL SAFETY DATA SHEET

PRODUCT

PP02-3816

EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :

Keep at temperatures above 120 °F

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Contact with strong alkalies (e.g. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chlorites) may generate heat, splattering or boiling and toxic vapors. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat,splattering or boiling and toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

No toxicity studies have been conducted on this product.

If released into the environment, see CERCLA/SUPERFUND in Section 15.

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MATERIAL SAFETY DATA SHEET

PRODUCT

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13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and RecoveryAct (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

Proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

IMDG Page :
Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Severely Hydrotreated Heavy Naphthenic Distillate : Exposure Limit

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

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SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the followingEPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The chemical substances in this product are on the 8(b) Inventory (40 CFR 710).

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 176.210 Defoaming agents used in the manufacture of paper and paperboard.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
None of the substances are specifically listed in the regulation.

NATIONAL REGULATIONS, CANADA :

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EMERGENCY TELEPHONE NUMBER
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WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
Not considered a WHMIS controlled product.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

16. OTHER INFORMATION

DN3816

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, Co.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

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The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO

Prepared By : Product Safety Department
Date issued : 06/07/1999
Replaces :

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*PROPANE PROPANE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

PROPANE PROPANE

Chemical Name and/or Family or Description:

Aliphatic Hydrocarbon

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Propane	74-98-6	1000 ppm TWA-OSHA	100

MSDS CODE AND NAME	:	***PROPANE PROPANE***
DATE ISSUED	:	***7/1/2004***
DATE PRINTED	:	***7/1/2004***
COMPANY	:	**HUNTSMAN**

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Gas

Odor:

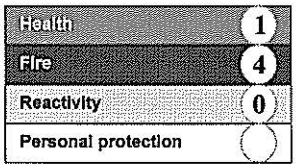
If odorized will have rotten egg odor - otherwise, odorless

WARNING STATEMENT

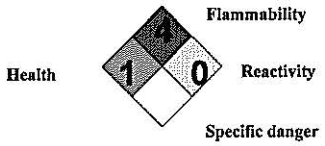
DANGER !

FLAMMABLE GAS - MAY CAUSE FLASH FIRE
DELAYED EVAPORATION FROM CONTAMINATED CLOTHING MAY BE A FIRE HAZARD
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

MSDS CODE AND NAME	:	*PROPANE PROPANE*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

If purchased for consumer use, contains or may release alkyl mercaptans (e.g., methyl mercaptan, ethyl mercaptan). Mercaptan concentrations above permissible concentrations can cause headache, dizziness, nausea, vomiting, and diarrhea. At concentrations above 400 ppm, respiratory paralysis, causing unconsciousness and death can occur.

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Overexposure to this material may sensitize the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information.

This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

NOTE TO EMERGENCY RESPONDERS: The odor of mercaptans such as methyl mercaptan or ethyl mercaptan is offensive and similar to rotten eggs. The presence of odors is not a reliable warning signal. DO NOT use odor to estimate the amount of mercaptan vapors present.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

467.8 (874 F)

Flash Point (degrees C):

-104.4 (-156 F)

Flammable Limits % (Lower-Upper):

Lower: 2.3
Upper: 9.5

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Readily forms explosive air-vapor mixtures; may release explosive vapors that travel, be ignited at remote locations, and flash back. Containers may explode in fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

MSDS CODE AND NAME	:	*PROPANE PROPANE*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Propane: OSHA PEL-TWA 1000 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Gas

Odor:

If odorized will have rotten egg odor - otherwise, odorless

Boiling Point (degrees C):

-42.2 (-44 F)

Melting/Freezing Point (degrees C):

-187.6 (-306 F)

MSDS CODE AND NAME	:	***PROPANE PROPANE***
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COMPANY	:	**HUNTSMAN**

Specific Gravity (water=1):

.5074

pH:

Not applicable.

Vapor Pressure:

7600 mmHg at 27 C (80.6 F)

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

1.5

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

None

MSDS CODE AND NAME	: *PROPANE*	*PROPANE*
DATE ISSUED	: *7/1/2004*	
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COMPANY	: *HUNTSMAN*	

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class:
2.1

Identification Number:
UN 1075

Packing Group:
Not applicable

Label Required:
Flammable gas

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class
2.1

Identification Number
UN 1978

Packing Group
Not applicable

Label Required
Flammable gas

ICAO

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class
2.1

Identification Number
UN 1978

Packing Group
Not applicable

Label Required
Flammable gas

MSDS CODE AND NAME	:	***PROPANE PROPANE***
DATE ISSUED	:	**7/1/2004**
DATE PRINTED	:	**7/1/2004**
COMPANY	:	**HUNTSMAN**

TDG

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class:
2.1

Identification Number:
UN 1978

Label Required:
Flammable gas

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
Methyl mercaptan (if odorized - 50 ppm max)	74-93-1	0.005	500	100

Section 311 Hazardous Categorization:
Acute X **Chronic** **Fire** X **Pressure** X **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Methyl mercaptan (if odorized - 50 ppm max)	74-93-1	0.005	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Propane	IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

Export Notification (TSCA-12b):
This product may be subject to export notification under TSCA section 12(b); contains: Methyl mercaptan (if odorized - 50 ppm max)

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

MSDS CODE AND NAME	:	***PROPANE PROPANE***
DATE ISSUED	:	***7/1/2004***
DATE PRINTED	:	***7/1/2004***
COMPANY	:	**HUNTSMAN**

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
Not determined

Japan Inventory Status:
Not determined

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not applicable

Persistence and Biodegradability:

Not applicable.

Potential to Bioaccumulate:

Not applicable.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Dispose of as a vapor, venting at a safe location, keeping gas below explosive limit (LEL).

The information below is given to call attention to the issue of "naturally occurring radioactive materials". Although radon-222 levels in this product do not present any direct radon exposure, customers should be aware of the potential of radon daughter product buildup within their processing streams whatever the source of their product streams. Radon-222 is a naturally occurring radioactive gas which can be a contaminant in natural gas. During subsequent processing, radon tends to be concentrated in the liquified petroleum gas stream and in product streams having a similar boiling point range. Industry experience has shown that this product may contain small amounts of radon-222 and its radioactive decay products, called radon "daughters". The actual concentration of Radon-222 and radioactive daughters in the process equipment (IE lines, filters, pumps and reactor units) may accumulate significant levels of radioactive daughters and show a gamma radiation reading during operation. A potential external radiation hazard exists at or near any pipe, valve or vessel containing a radon-enriched stream or containing internal deposits of radioactive material, due to the transmission of gamma radiation through its wall. Field studies in the literature and conducted by company personnel at selected sites, have not shown any conditions that subject workers to cumulative exposures in excess of general population limits. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha-emitting decay products which may be a hazard if inhaled or ingested. During maintenance operations that require the opening of contaminated process equipment, the flow of gas should be stopped and a four hour delay enforced to allow the gamma radiation to drop to background levels. Protective equipment E.G. coveralls, gloves and respirator (NIOSH/MSHA approved for high efficiency particulates and radionuclides, or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion or inhalation of any residue containing alpha radiation. Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state.

NFPA NO. 58 REQUIRES ODORIZATION OF PROPANE SOLD FOR GENERAL CONSUMER USE. ODORIZATION PROVIDES A METHOD OF DETECTION IN THE EVENT OF A LEAK. COMMON ODORANTS INCLUDE ETHYL MERCAPTAN AND THIOPANE. A BRIEF SUMMARY OF THE SAFETY INFORMATION REGARDING THE ODORANT IS PROVIDED HERE. FOR MORE DETAILED INFORMATION, PLEASE REFER TO THE REFERENCE SECTION. DO NOT RELY ON ODOR TO WARN OF PRESENCE OF GAS. IT IS IMPORTANT TO NOTE THAT NO ODORANT IS EFFECTIVE 100% OF THE TIME UNDER ALL CONDITIONS. THE EFFECTIVENESS OF THE ODORANT CAN BE REDUCED BY EXPOSURE TO SMALL AMOUNTS OF OXYGEN, MOISTURE, RUST OR SCALE. IN ADDITION, THE ODORANT MAY BE ABSORBED BY SOIL, NEW TANK SURFACES, NEW PIPING, OR CERTAIN BUILDING MATERIALS SUCH AS MASONRY. WHENEVER AN EMPTY TANK IS FILLED, IT MUST BE COMPLETELY PURGED IN ACCORDANCE WITH NPGA BULLETIN 133-89 TO REMOVE AIR AND WATER. THE INTEGRITY OF UNDERGROUND PIPES SHOULD BE CHECKED PERIODICALLY. IF PROPANE LEAKS FROM AN UNDERGROUND PIPE, THE SOIL MAY ABSORB THE ODORANT AS THE GAS MIGRATES TO THE SURFACE, WHICH COULD LEAVE THE GAS UNDETECTED BY SMELL. IF A PROPANE SYSTEM HAS NOT BEEN USED FOR AN EXTENDED PERIOD, IT SHOULD BE THOROUGHLY CHECKED BEFORE CONTINUING USE. CERTAIN PHYSICAL CIRCUMSTANCES SUCH AS COLDS, ALLERGIES, SMOKING, ALCOHOL, AGE OR STRONG COMPETING ODORS MAY

MSDS CODE AND NAME	:	***PROPANE PROPANE***
DATE ISSUED	:	**7/1/2004**
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AFFECT A PERSON'S ABILITY TO SMELL ANY ODOR. IN ADDITION, AS WITH ANY ODOR, CONTINUED EXPOSURE TO PROPANE ODORANT CAN REDUCE A PERSON'S ABILITY TO DETECT THE ODORANT.
REFERENCES NPGA BULLETIN NO. 133-80 "PURGING NEW CONTAINERS" NFPA BULLETIN NO. 58, "STORAGE AND HANDLING OF LIQUIFIED PETROLEUM GAS"

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*PGUSP PROPYLENE GLYCOL - USP*
DATE ISSUED	:	5/13/2005
DATE PRINTED	:	5/13/2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

PGUSP PROPYLENE GLYCOL - USP

Chemical Name and/or Family or Description:

Glycol

COMPANY INFORMATION

Huntsman Propylene Oxide Ltd.
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (800) 328-8501
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
1,2-propanediol	57-55-6		100.00

REFER TO SECTION 16 OF THE MSDS FOR PROHIBITED PRODUCT APPLICATIONS.

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DATE ISSUED	:	*5/13/2005*
DATE PRINTED	:	*5/13/2005*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless mobile liquid

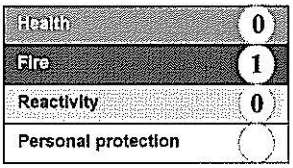
Odor:

Mild

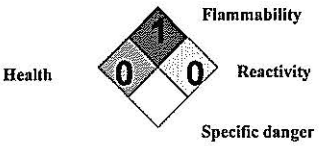
WARNING STATEMENT

CAUTION!	ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
ATTENTION:	THIS PRODUCT IS NOT TO BE USED TO PRODUCE FOGS OR MISTS IN THEATRICAL, MUSICAL OR OTHER ENTERTAINMENT PERFORMANCES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes:	May cause minimal irritation, experienced as temporary discomfort.
Skin:	Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.
Inhalation:	Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.
Ingestion:	If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur. Aspiration may occur during swallowing or vomiting resulting in lung damage.
Sensitization Properties:	Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

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None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

371.1 (700°F)

Flash Point (degrees C):

100 (212°F) (CC)

Flammable Limits % (Lower-Upper):

Lower: 2.6
Upper: 12.5

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

No special equipment or procedures required.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Contain spill if possible, contain with absorbent materials such as clay or soil, and shovel up. Avoid skin and eye contact.

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7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Local exhaust ventilation recommended if generating vapor, dust, or mist. If exhaust ventilation is not available or inadequate, use MSHA or NIOSH approved respirator as appropriate.

Exposure Limit for the Total Product:

None established for product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless mobile liquid

Odor:

Mild

Boiling Point (degrees C):

187.2 (369°F)

Melting/Freezing Point (degrees C):

<-60 (<-76°F)

Specific Gravity (water=1):

1.0381

pH:

6

Vapor Pressure:

<1 mm Hg at 25°C (77°F)

Viscosity:

<20 cSt at 40°C (104°F)

VOC Content:

28% by ASTM D 2369

Vapor Density (Air=1):

2.6

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others None of these X

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 > 5.00 g/kg (rat) practically non-toxic
Dermal:
LD50 > 2.00 g/kg (rabbit) practically non-toxic
Inhalation:
Believed to be practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Eyes:
(Draize)Believed to be < 15.00 /110 (rabbit) no appreciable effect
Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

None

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COMPANY	:	HUNTSMAN

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated

Hazard Class:
Not regulated

Identification Number:
Not regulated

Packing Group:
Not regulated

Label Required:
Not regulated

IMDG

Proper Shipping Name:
Not regulated

ICAO

Proper Shipping Name:
Not regulated

TDG

Proper Shipping Name:
Not regulated

Hazard Class:
Not regulated

Identification Number:
Not regulated

Label Required:
Not regulated

MSDS CODE AND NAME	:	*PGUSP PROPYLENE GLYCOL - USP*
DATE ISSUED	:	5/13/2005
DATE PRINTED	:	5/13/2005
COMPANY	:	HUNTSMAN

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute **Chronic** **Fire** **Pressure** **Reactive** **N/A** X

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
None.	

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Not regulated.

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

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COMPANY	:	*HUNTSMAN*

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is believed to be > 100.00 mg/liter practically nontoxic

Mobility:

Not determined.

Persistence and Biodegradability:

This product is reported to have a moderate (>= 30%) rate of biodegradation in a test for ready biodegradation.

Potential to Bioaccumulate:

This product is reported to have a low potential to bioconcentrate.

Remarks:

None

16. OTHER INFORMATION 5/13/2005

This product is currently on the FDA's GRAS (generally regarded as safe) list.

This product is not to be used to produce fogs or mists in theatrical, musical or other entertainment performances.

Supercedes: 07/01/2004 **The following sections have been revised: 11, 14**

Date Issued: 5/13/2005.

THE INFORMATION IN THIS DATA SHEET IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT. IT IS PROVIDED FOR THE PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONARY HANDLING OF THE PRODUCT BY A PROPERLY TRAINED PERSON. YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN. THE DATA RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED, AND DOES NOT RELATE TO USE OF THE PRODUCT IN COMBINATION WITH ANY OTHER MATERIAL OR USE OF THE PRODUCT IN ANY PROCESS. THE DATA IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY FOR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT, ITS COMPOSITION, ITS SAFETY OR THE INFORMATION CONTAINED IN THIS DATA SHEET.

TO DETERMINE THE APPLICABILITY OR THE EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, THE USER SHOULD CONSULT A LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

CURRENT DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, USE OR DISTRIBUTE BY CALLING (281) 719-6432 OR DIRECTING YOUR INQUIRIES TO:

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE. NO PART OF THIS DATA SHEET MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM, OR BY ANY MEANS, WITHOUT PERMISSION IN WRITING FROM HUNTSMAN. ALL REQUESTS FOR PERMISSION TO REPRODUCE MATERIAL FROM THIS DATA SHEET SHOULD BE DIRECTED TO HUNTSMAN, MANAGER, PRODUCT SAFETY AT THE ABOVE ADDRESS.

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*PO PROPYLENE OXIDE*
DATE ISSUED	:	3/21/2005
DATE PRINTED	:	4/29/2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

PO PROPYLENE OXIDE

Chemical Name and/or Family or Description:

Alkylene oxide

COMPANY INFORMATION

Huntsman Propylene Oxide Ltd.
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (800) 328-8501
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC__X__ NTP__X__ OTHER__X__ NONE____

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Oxirane, methyl- (Common name - Propylene oxide)	75-56-9	100.0 ppm TWA-OSHA 2.0 ppm TWA-ACGIH (A3)	100.00

MSDS CODE AND NAME	:	*PO PROPYLENE OXIDE*
DATE ISSUED	:	3/21/2005
DATE PRINTED	:	4/29/2005
COMPANY	:	HUNTSMAN

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless liquid

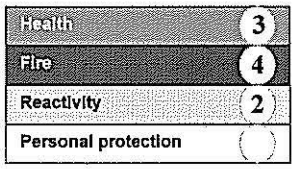
Odor:

Ether-like odor

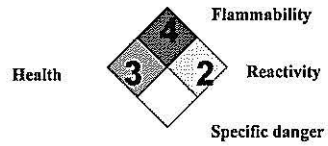
WARNING STATEMENT

DANGER!	EXTREMELY FLAMMABLE LIQUID AND VAPOR VAPOR MAY CAUSE FLASH FIRE HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN MAY CAUSE DIZZINESS AND DROWSINESS CAUSES EYE AND SKIN IRRITATION MAY CAUSE RESPIRATORY TRACT IRRITATION ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE MAY CAUSE ALLERGIC SKIN REACTION MAY CAUSE LIVER DAMAGE BASED ON ANIMAL DATA
ATTENTION !	CONTAINS PROPYLENE OXIDE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. In addition to the potential skin irritation effects noted above, skin contact may result in other adverse health effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing.

Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Inhalation may result in absorption of potentially harmful amounts of material.

Ingestion: Toxic. Causes abdominal discomfort, nausea, vomiting, diarrhea, weakness, and collapse. Severe poisoning may cause death. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

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Sensitization Properties: This product or a component of this product is a known human skin sensitizer. Therefore, contact with this product may cause an allergic skin reaction in sensitive, exposed persons.

Chronic:

Repeated inhalation may cause lung damage. Repeated skin contact may cause a persistent irritation or dermatitis.

Medical Conditions Aggravated by Exposure:

Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition).

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Wash with soap or detergent. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

465 (869°F)

Flash Point (degrees C):

-37.2 (-35°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 1.8
Upper: 36

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Use dry chemical, alcohol resistant foam, carbon dioxide, or water spray. Use water spray to cool fire-exposed containers.

Unusual or Explosive Hazards:

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COMPANY	:	HUNTSMAN

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Explosive air-vapor mixtures may form. Containers may explode in a fire.

Reacts violently with chlorine, ammonia, strong oxidants, acids causing fire and explosion hazard.

Special Protective Equipment for Firefighters:

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Dilute with large quantities of water. Use water spray or foam to suppress vapors. Depending on the volume and location of the spill, pumping with explosion-proof equipment may be suitable. Residual propylene oxide in the containment area should be flushed with water into a sump or collection area for subsequent treatment or disposal. Prevent entry into sewers and waterways. Since contact of propylene oxide with some absorbents generates heat, use of all absorbents is to be avoided.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Keep away from heat, sparks or flame. Use only with adequate ventilation. Avoid breathing vapor, mist, or gas. Avoid contact with eyes, skin, and clothing. Keep container closed. Wash thoroughly after handling.
Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.
Eye wash should be available nearby when this product is handled or used.
Do not contact with copper or copper alloys as explosive copper compounds may be formed.
An inert gas atmosphere or "pad" of nitrogen or methane is required over propylene oxide during transfer to prevent air from entering the system and forming explosive air-vapor mixtures.
Use spark-proof tools. All equipment used in propylene oxide service should be electrically grounded and all electrical equipment be explosion-proof.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition. Protect containers against static electricity, lightning, and physical damage.
Do not use copper, copper alloys, or other acetylide-forming metals for storage or shipping containers. Carbon steel storage tanks and piping is satisfactory.
An inert gas atmosphere or "pad" of nitrogen or methane is required over propylene oxide for storage or shipment to prevent air from entering the system and forming explosive air-vapor mixtures.
Periods of exposure to high temperatures should be minimized. Propylene oxide may polymerize on prolonged storage and at elevated temperatures. Water contamination should be avoided.

MSDS CODE AND NAME	:	*PO PROPYLENE OXIDE*
DATE ISSUED	:	*3/21/2005*
DATE PRINTED	:	*4/29/2005*
COMPANY	:	*HUNTSMAN*

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Gloves and boots resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn. Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

Propylene oxide: OSHA PEL-TWA 100 ppm; ACGIH TLV-TWA 2 ppm (A3)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless liquid

Odor:

Ether-like odor

Boiling Point (degrees C):

34.1 (93.4°F)

Melting/Freezing Point (degrees C):

-104 (-155°F)

Specific Gravity (water=1):

0.8305 at 20/20°C

pH:

7 [Neutral]

Vapor Pressure:

442 mmHg at 20°C (68°F)

Viscosity:

0.3 cSt at 20°C (68°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

2

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat__X__ Strong Oxidizers__X__ Others__X__ None of these____

Comments:

This material reacts with clay based absorbents, acids, bases, peroxides, chlorine, ammonia, iron, and acetylide-forming metals such as copper, silver, mercury, and their alloys. Since contact of propylene oxide with some absorbents generates heat, use of all absorbents should be avoided.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.

Hazardous Polymerizations:

MAY OCCUR - Product may explode if polymerization is initiated in closed containers under high temperatures or prolonged storage. The substance may polymerize violently under the influence of bases, acids and metal chlorides with fire or explosion hazard.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 0.5 - 2.0 ppm (rat) moderately toxic
Dermal:
LD50 Believed to be > .50 - 1.00 g/kg (rabbit) moderately toxic
Inhalation:
Believed to be moderately toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

Prolonged and repeated exposure of animals to high concentrations of propylene oxide has caused liver injury.

Propylene oxide has caused cancer in the nasal passages, lungs, stomach, and mammary glands of laboratory animals. IARC has classified propylene oxide as a Group 2B carcinogen ("possibly carcinogenic to humans: limited human evidence, absence of sufficient evidence in animals"). Although embryo/fetal toxicity occurs in laboratory animals exposed to high concentrations, there is no evidence that propylene oxide causes birth defects.

MSDS CODE AND NAME	:	*PO PROPYLENE OXIDE*
DATE ISSUED	:	3/21/2005
DATE PRINTED	:	4/29/2005
COMPANY	:	HUNTSMAN

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability and reactivity, and, if discarded in its present form, would have the hazardous waste number of D001 and D003. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to, ignitability and reactivity.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Propylene oxide

Hazard Class:
3: Flammable liquid.

Identification Number:
UN1280

Packing Group:
I

Label Required:
Class 3: Flammable liquid

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 for composition and component RQ information.

IMDG

Proper Shipping Name:
Propylene oxide

Hazard Class:
3.1 - Flammable liquids

Identification Number:
UN1280

Packing Group:
I

Label Required:
Class 3 - Flammable liquids

ICAO

Proper Shipping Name:
Propylene oxide

Hazard Class:
3 - Flammable Liquids

Identification Number:
UN1280

Packing Group:

MSDS CODE AND NAME	:	*PO PROPYLENE OXIDE*
DATE ISSUED	:	3/21/2005
DATE PRINTED	:	4/29/2005
COMPANY	:	HUNTSMAN

I

Label Required:
Class 3 - Flammable Liquid

TDG

Proper Shipping Name:
Propylene oxide

Hazard Class:
3.1/9.2

Identification Number:
UN1280

Packing Group:
I

Label Required:
Flammable liquid

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
Propylene oxide	75-56-9	100.00	10,000	100

Section 311 Hazardous Categorization:

Acute__X__ Chronic__X__ Fire__X__ Pressure____ Reactive__X__ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Propylene oxide	75-56-9	100.00

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Propylene oxide	75-56-9	100.00	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Propylene oxide	CT,FL,IL,LA,MA,MI,NJ,PA,RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Propylene oxide	75-56-9

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class B, Div 2: Flammable liquid
Class D, Div 1, Subdiv B: Toxic
Class D, Div 2, Subdiv A: Carcinogenic
Class D, Div 2, Subdiv B: Skin sensitizer

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC_{50}-96hr > 100 mg/liter (fish) practically nontoxic
EC_{50}-48hr > 100 mg/liter (Daphnia magna) practically nontoxic
LC_{50}-96hr >100 mg/liter (algae) practically nontoxic

Mobility:

Propylene oxide is soluble in water and is expected to be mobile in soils and not expected to adsorb to suspended solids or sediments in water.

Persistence and Biodegradability:

Propylene oxide is inherently biodegradable and is not expected to persist in the environment.

Potential to Bioaccumulate:

Propylene oxide is not expected to bioaccumulate (log $K_{(ow)}$ = 0.055).

Remarks:

None

16. OTHER INFORMATION 3/21/2005

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Supercedes: 7/1/2004 **The following sections have been revised: 6, 10**

Date Issued: 3/21/2005.

MSDS CODE AND NAME	:	*PO PROPYLENE OXIDE*
DATE ISSUED	:	3/21/2005
DATE PRINTED	:	4/29/2005
COMPANY	:	HUNTSMAN

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4900

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

RGC3E PROPYLENE R/G

Chemical Name and/or Family or Description:

Olefin

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Propylene (propene, methylethylene)	115-07-1		65.00-79.99
Propane	74-98-6	1000 ppm TWA-OSHA	20.00-34.99

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless gas

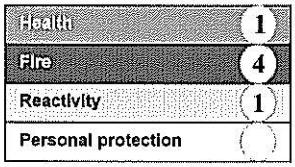
Odor:

Odorless

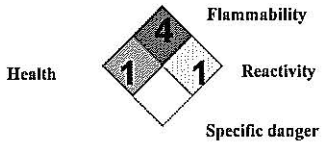
WARNING STATEMENT

DANGER ! FLAMMABLE GAS - MAY CAUSE FLASH FIRE
LIQUID MAY CAUSE FROSTBITE
MAY CAUSE DIZZINESS AND DROWSINESS
GAS REDUCES OXYGEN AVAILABLE FOR BREATHING
GAS MAY ACCUMULATE IN CONFINED SPACES AND CAUSE SUFFOCATION
MAY CAUSE RESPIRATORY TRACT IRRITATION

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: Eye contact with liquid product or gas under pressure can cause frostbite (cold burns).

Skin: Brief contact is not irritating. Product is a gas - not expected to be absorbed through the skin. Skin contact with liquid product can cause frostbite (cold burns).

Inhalation: Gas may be irritating and cause discomfort in nose and throat, nasal discharge, and coughing. Prolonged overexposure may cause difficulty breathing. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result.

Ingestion: Product is a gas - not expected to cause toxic effects due to ingestion. This material is a gas. Gas or liquid under pressure may cause frostbite (cold burns).

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

In case of cold burn, immediately place affected area in warm water (105 F) and keep at this temperature until circulation returns. Get medical attention. If clothing becomes wetted, drench individual with water and remove contaminated clothing if possible. Slowly warm affected area of skin. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

No emergency care anticipated. This material is a gas at standard temperature and pressure.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Overexposure to this material may sensitize the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information. This material is an asphyxiant which may have anesthetic properties at high concentrations. If present in sufficient concentrations to reduce the oxygen level below 18% in inhaled air, rapid respiration, mental dullness, incoordination, poor judgement, nausea, and unconsciousness may result. Oxygen deficiency may occur without warning in areas where this gas may displace air.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

497.2 (927 F)

Flash Point (degrees C):

-107.6 (-162 F)

Flammable Limits % (Lower-Upper):

Lower: 2
Upper: 11

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Stop flow of gas before attempting to extinguish flames. Use water spray to cool fire-exposed containers and to protect persons attempting to stop the flow of gas. Use flooding quantities of water as fog or spary. Use dry chemical or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Danger! Readily forms explosive air-vapor mixtures; may release explosive vapors that travel, be ignited at remote locations, and flash back. Containers may explode in fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with eyes, skin, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard.

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Launder or dry-clean when soiled. Gloves and boots resistant to chemicals and petroleum distillates required. Insulated gloves also required if contact with liquid-cooled product or equipment is expected.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless gas

Odor:

Odorless

Boiling Point (degrees C):

-47.2 (-53 F)

Melting/Freezing Point (degrees C):

-185 (-301 F)

Specific Gravity (water=1):

.522

pH:

Not applicable.

Vapor Pressure:

7600 mmHg at 20 C (68 F)

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

Viscosity:

Not applicable.

VOC Content:

Not Determined

Vapor Density (Air=1):

1.4

Solubility in Water (%):

< .1

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat X **Strong Oxidizers** X **Others None of these**

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
Not applicable; material is a gas.
Inhalation:
Not determined.
Dermal:
Not applicable; material is a gas.

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

None

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	**HUNTSMAN**

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA characteristics of ignitability, and, if discarded in its present form, would have the hazardous waste number of D001. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to ignitability.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Petroleum gases, liquefied

Hazard Class:
2.1

Identification Number:
UN 1075

Packing Group:

Label Required:
Flammable gas

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:

Label Required:
Not determined.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

None.

Section 311 Hazardous Categorization:

Acute **Chronic** **Fire** X **Pressure** X **Reactive** X **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Propylene (propene, methylethylene)	115-07-1	65.00-79.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Propylene (propene, methylethylene)	FL, IL, MA, NJ, PA, RI
Propane	IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class A: Compressed gas Class B, Div 1: Flammable gas

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not applicable

Persistence and Biodegradability:

Not applicable.

MSDS CODE AND NAME	:	*RGC3E PROPYLENE R/G*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

Potential to Bioaccumulate:

Not applicable.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

The information below is given to call attention to the issue of "naturally occurring radioactive materials". Although radon-222 levels in this product do not present any direct radon exposure, customers should be aware of the potential of radon daughter product buildup within their processing streams whatever the source of their product streams. Radon-222 is a naturally occurring radioactive gas which can be a contaminant in natural gas. During subsequent processing, radon tends to be concentrated in the liquified petroleum gas stream and in product streams having a similar boiling point range. Industry experience has shown that this product may contain small amounts of radon-222 and its radioactive decay products, called radon "daughters". The actual concentration of Radon-222 and radioactive daughters in the process equipment (IE lines, filters, pumps and reactor units) may accumulate significant levels of radioactive daughters and show a gamma radiation reading during operation. A potential external radiation hazard exists at or near any pipe, valve or vessel containing a radon-enriched stream or containing internal deposits of radioactive material, due to the transmission of gamma radiation through its wall. Field studies in the literature and conducted by company personnel at selected sites, have not shown any conditions that subject workers to cumulative exposures in excess of general population limits. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha-emitting decay products which may be a hazard if inhaled or ingested. During maintenance operations that require the opening of contaminated process equipment, the flow of gas should be stopped and a four hour delay enforced to allow the gamma radiation to drop to background levels. Protective equipment E.G. coveralls, gloves and respirator (NIOSH/MSHA approved for high efficiency particulates and radionuclides, or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion or inhalation of any residue containing alpha radiation. Airborne contamination may be minimized by handling scale and/or contaminated materials in a wet state. Dispose of as a vapor, venting at a safe location, keeping gas below explosive limit (LEL).

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*PYGAS1 PYROLYSIS GASOLINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

PYGAS1 PYROLYSIS GASOLINE

Chemical Name and/or Family or Description:

Hydrocarbon

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA__X__ IARC__X__ NTP__X__ OTHER__X__ NONE____

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Hydrocarbons, ethylene manufacturing byproduct distillation residues	68921-67-5		100
CONTAINS:			
Aliphatic hydrocarbons, C5 and greater	68647-60-9		1.00-79.99
Toluene	108-88-3	200 ppm TWA-OSHA 300 ppm CEILING-OSHA 50 ppm TWA-ACGIH (A3) (SKIN)	1.00-79.99
Dicyclopentadiene	77-73-6	5 ppm TWA-ACGIH	1.00-1.99
Xylenes	1330-20-7	100 ppm TWA-OSHA 100 ppm TWA-ACGIH 150 ppm STEL-ACGIH	3.00-19.99
Heavy aromatics	68333-88-0		3.00-9.99

MSDS CODE AND NAME	:	***PYGAS1 PYROLYSIS GASOLINE***
DATE ISSUED	:	***7/1/2004***
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COMPANY	:	**HUNTSMAN**

Benzene	71-43-2	0.5 ppm TWA ACTION LIMIT-OSHA 1.0 ppm TWA-OSHA 5.0 ppm STEL-OSHA 25 ppm CIELING LIMIT-OSHA (Subject to 29 CFR 1910.1028) 0.5 ppm TWA-ACGIH (A1) (SKIN) 2.5 ppm STEL-ACGIH	0.10-2.99
Styrene	100-42-5	100 ppm TWA-OSHA 200 ppm CEILING LIMIT-OSHA 20 ppm TWA-ACGIH (A4) (SKIN) 40 ppm STEL-ACGIH	1.00-2.99
Ethylbenzene	100-41-4	100 ppm TWA-OSHA 100 ppm TWA-ACGIH 125 ppm STEL-ACGIH	1.00-9.99
Naphthalene	91-20-3	10 ppm TWA-OSHA 10 ppm TWA-ACGIH (A4) (SKIN) 15 ppm STEL-ACGIH	1.00-2.99

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Amber liquid

Odor:

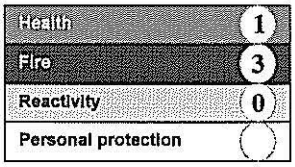
Benzene

WARNING STATEMENT

DANGER ! EXTREMELY FLAMMABLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MAY CAUSE DIZZINESS AND DROWSINESS
MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT
CAN CAUSE KIDNEY, BLOOD, AND EYE DAMAGE (CATARACTS)
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
CAN CAUSE DAMAGE TO LIVER, KIDNEY, AND BLOOD FORMING ORGANS

ATTENTION ! CONTAINS BENZENE - CANCER HAZARD
CONTAINS TOLUENE - WHICH MAY CAUSE NERVOUS SYSTEM DAMAGE
BASED ON ANIMAL DATA
CONTAINS STYRENE - MAY CAUSE CANCER BASED ON ANIMAL DATA
AND NERVOUS SYSTEM DAMAGE

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

MSDS CODE AND NAME	: *PYGAS1*	*PYROLYSIS GASOLINE*
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Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Prolonged, widespread, or repeated skin contact may result in the absorption of potentially harmful amounts of material. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist may cause irritation of the nose and throat. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Prolonged and repeated overexposure to toluene at excessive concentrations encountered upon substance abuse (i.e. addictive sniffing) may cause nervous system effects, experienced as euphoria, hallucinations, behavior changes, double vision, difficulty walking, convulsions, and coma. Permanent psychological disturbances have also been described. Prolonged and repeated overexposure to naphthalene may cause eye damage (cataract formation).

Medical Conditions Aggravated by Exposure:

Overexposure may aggravate existing blood disorders, such as anemia. Because of its defatting properties, prolonged and repeated skin contact may aggravate an existing dermatitis (skin condition). Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

This product contains benzene. Prolonged and repeated exposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans. Ingestion of naphthalene may cause abdominal cramping, nausea, vomiting, and profuse sweating. Severe poisoning may cause kidney damage and destruction of red blood cells. Overexposure to naphthalene vapors may cause eye irritation, headache, and nausea.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing (See Other Instructions). Destroy non-resistant footwear. Get medical attention if skin irritation persists or contact has been prolonged.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

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COMPANY	: **HUNTSMAN**	

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

Severe intoxication from naphthalene ingestion can cause intravascular hemolysis. Symptoms may include profuse sweating, nausea, vomiting and abdominal pain. Red blood cell fragmentation, leukocytosis, decreased hemoglobin and hematocrit, hematuria, hemoglobinuria, and acute renal failure can occur. Individuals with glucose-6-phosphate dehydrogenase deficiency are more susceptible to the hemolytic effects of naphthalene poisoning. Contact a Poison Control Center for additional information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

537.8 (1000°F)

Flash Point (degrees C):

-11.1 (12°F) (CC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 8

Recommended Fire Extinguishing Agents And Special Procedures:

Water may be ineffective on flames but should be used to cool fire-exposed containers and provide protection for persons attempting to stop the leak. Use water spray, dry chemical, foam or carbon dioxide to extinguish flames.

Unusual or Explosive Hazards:

Heating greatly increases explosive hazard. Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Keep away from heat, sparks or flame.
Avoid breathing vapor, mist, or gas.
Avoid contact with eyes, skin, and clothing.
Use only with adequate ventilation.
Keep container closed.
Wash thoroughly after handling.
Use spark-proof tools.
Material may be at elevated temperatures and/or pressures.
Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container. Keep away from heat, sparks, flame, and other sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Gloves resistant to petroleum distillates are recommended to minimize skin contact. The most effective glove materials are Nitrile rubber, Teflon, or Viton for prolonged contact with gasoline. Protective clothing such as coveralls or boots should be also be worn where contact with product is likely.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Amber liquid

Odor:

Benzene

Boiling Point (degrees C):

42.2 (108°F)

Melting/Freezing Point (degrees C):

Not determined.

Specific Gravity (water=1):

0.8794

pH:

Not applicable.

Vapor Pressure:

150 mmHg at 20°C (68°F)

Viscosity:

<20 cSt at 40°C (104°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

3

Solubility in Water (%):

<0.1 [Insoluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat__X__ Strong Oxidizers__X__ Others____ None of these____

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 2.00 - 5.00 g/kg (rat) slightly toxic
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 3.00 -5.00 /8.0 (rabbit) moderately irritating
Eyes:
(Draize) Believed to be > 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

Benzene:
Prolonged and repeated exposure to benzene has caused anemia, lymphoma, and other cancers, in laboratory animals. Benzene has been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (i.e., illness in the mother).

Dicyclopentadiene:
Repeated exposure to dicyclopentadiene has caused kidney changes in male rats.

Ethylbenzene:
Carcinogenicity:
A preliminary report from a chronic (lifetime) inhalation exposure study in rats and mice exposed to ethylbenzene (EB) has been recently released by the National Toxicology Program (NTP), the sponsor of the study. In this study, rats and mice (both sexes) were exposed to EB vapors at 75, 250 or 750 parts per million (ppm). In this study, male rats showed an increased incidence of kidney tumors (renal tubule adenoma or carcinoma) and testicular tumors (interstitial cell adenoma), and female rats showed an increase in kidney tumors (renal tubule adenoma). Male mice showed an increase in lung tumors (alveolar/bronchial neoplasms) and female mice

showed an incidence of liver tumors (hepatocellular neoplasms). For all of the above tumors, the tumor incidence was significantly increased only at the highest exposure level of 750 ppm. In their preliminary report, NTP has concluded that there is "clear evidence" of cancer in male rats, and "some evidence" of cancer in female rats, and male and female mice.

These study findings were quite unexpected, both by NTP and industry scientists, since the results from previously-conducted subchronic exposure studies gave no indication of a potential carcinogenic effect from exposures to EB. In addition, genotoxicity studies conducted on EB have consistently shown that EB is not genotoxic.

The relevance (if any) of these tumors to humans is not known. The ACC Ethylbenzene Panel, as well as NTP, is sponsoring additional investigations to determine the possible mechanisms of EB toxicity/carcinogenicity and the relevance of these mechanisms to human carcinogenicity.

Other chronic effects:
Prolonged and repeated exposure of laboratory animals to high levels of ethylbenzene via inhalation or ingestion has cause liver and kidney effects as well as central nervous system depression. Ethylbenzene has also been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (e.g. illness in the mother).

Hydrocarbons:
Prolonged and repeated inhalation exposure to hydrocarbon vapors in a boiling range similar to this product caused kidney damage and kidney cancer in male rats and liver tumors in female mice. Many scientists do not believe that the male rat is an appropriate predictor of human kidney disease and are not in agreement on the relationship between liver tumors in laboratory animals and humans.

Naphthalene:
When fed to laboratory animals, naphthalene caused red blood cell, kidney and eye damage. Eye damage was demonstrated by cataract formation and retinal injury. Inhalation of naphthalene vapor has also caused cataracts in animals.

Styrene:
Cancer:
Chronic (lifetime) inhalation exposure studies in rats and mice exposed to styrene vapors have been recently completed. These studies were sponsored by Huntsman Corporation and the other member companies of the Styrene Information and Research Center (SIRC) to address the deficiencies of previously conducted chronic exposure studies which were considered to be inadequate to assess the carcinogenic potential of styrene. In the SIRC studies, rats exposed to styrene concentrations of up to 1000 parts per million (ppm) did not show an increase in tumors, however, mice exposed to concentrations of 20 to 160 ppm showed an increase in bronchoalveolar (lung) tumors when compared to the untreated study mice. These lung tumors were a late-occurring event in this study, and are thought to be due to the proliferation (rapid growth) of a cell type that is relatively common in the affected area of the mouse lung, and is relatively uncommon in the same area of the rat and human lung. At this time, the relevance (if any) of these cell-type specific mouse lung tumors to humans is not known.

To investigate the relevance of these mouse tumors to humans, SIRC is sponsoring additional studies to determine: the target cell in the mouse lung, the toxic agent causing this proliferation, and the mechanism of action of the toxic agent upon the lung target cell. Information from these studies should provide the necessary information to determine the relevance of these mouse lung tumors to humans.

It should be noted, however, that several workplace exposure (epidemiological) studies investigating the incidence of cancer in a large number of workers employed in the styrene, polystyrene and reinforced plastic industries have shown no increased cancer risk from workplace exposures to styrene.

Other chronic effects:
Nasal effects (degeneration of olfactory cells) were observed at styrene concentrations of 50 ppm and greater in rats, and 20 ppm and greater in mice, in the SIRC chronic exposure study. In a subchronic exposure study, repeated exposures of female mice to styrene concentrations of 150 ppm and greater for 13 weeks have resulted in liver toxicity. These findings were not observed in rats exposed to styrene in the same study. Although not observed in rodent studies, oral exposures of beagle dogs to styrene at levels of 400 mg/kg/day and greater resulted in subtle changes to circulating red blood cells. Some of these changes were reversible on cessation of styrene exposures. No bone marrow effects were observed in this study.

These effects, observed in animal toxicity studies, have not been observed in humans exposed to styrene at typical workplace exposures.

Neurological effects:
In a 13 week study, rats exposed to styrene concentrations of 800 ppm were observed to have some evidence of hearing loss, but this effect was not noted in rats exposed to 200 ppm. No other irreversible neurotoxic effects have been observed in rodents exposed to styrene. On the basis of the animal studies, and the experience of occupationally exposed individuals, no effects on human hearing are expected from workplace exposures to styrene vapors.

In studies investigating color discrimination among workers exposed to styrene vapors, a slight decrease in the ability to discriminate

among colors was observed in workers exposed to mean styrene concentrations in excess of 50 ppm. It is unlikely that this very subtle, but clinically measurable, decrease will be noticed by those affected.

Other neurologic effects have been noted in humans exposed to styrene. However, these effects have not been consistently or reliably observed at exposure levels below 50 ppm.

Developmental and reproductive toxicity:
Laboratory animal studies investigating the developmental and reproductive toxicity of styrene have indicated that styrene exposures, either as vapor, oral or drinking water exposures, do not result in any specific developmental or reproductive toxicity. Although some minor developmental effects were noted in some studies, these effects were either within the historical range for these effects, or were secondary to maternal toxicity from exposure to relatively high levels of styrene.

Although there have been very few studies investigating human developmental and reproductive effects following exposures to styrene, the limited available information supports the observation that there is no evidence of developmental or reproductive toxicity from workplace exposures to styrene.

Genotoxic effects:
The in-vitro (test tube) study data indicates that styrene does not produce bacterial mutagenicity with or without metabolic activation. However, test systems using a metabolic activation system have shown a variable mutagenic response in response to styrene. Styrene has also induced chromosomal aberrations and sister chromatid exchanges in certain mammalian cell in-vitro test systems, but the response of these systems is dependent on the metabolic activation system.

In laboratory animal studies, styrene was shown to induce increases in sister chromatid exchanges in both rats and mice, however, in chromosome aberration and micronucleus endpoints investigated in the same study, there were no observed increases in these indicators of chromosome damage.

Some cytogenetic studies on workers exposed to styrene have shown increases in chromosomal damage, although these effects do not appear to be related to styrene exposure levels and are not supported by the data observed in the animal studies.

Cancer classifications:
The International Agency for Research on Cancer (IARC) has evaluated styrene and has classified it as "Possibly Carcinogenic to Humans" under group 2B.

The American Conference of Governmental Industrial Hygienists (ACGIH) has evaluated styrene and has classified it as "Not Classifiable as a Human Carcinogen" under group A4.

Toluene:
Prolonged and repeated exposure of laboratory animals to toluene vapors has caused permanent hearing loss.

Xylene:
Prolonged and repeated exposure of laboratory animals to high levels of xylene via inhalation or ingestion has caused liver and kidney effects as well as central nervous system depression. Inhalation of high concentrations has also caused hearing loss in some animal studies. Xylene has also been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (e.g. illness in the mother).

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001 respectively. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitabilty.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

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COMPANY	: HUNTSMAN	

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Hydrocarbons, liquid, n.o.s. (Benzene, Toluene)

Hazard Class:
3

Identification Number:
UN3295

Packing Group:
II

Label Required:
FLAMMABLE LIQUID

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire__X__ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration

Benzene	71-43-2	0.10-2.99
Dicyclopentadiene	77-73-6	1.00-1.99
Ethylbenzene	100-41-4	1.00-9.99
Naphthalene	91-20-3	1.00-2.99
Styrene	100-42-5	1.00-2.99
Toluene	108-88-3	1.00-79.99
Xylenes	1330-20-7	3.00-19.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Benzene	71-43-2	0.10-2.99	10
Ethylbenzene	100-41-4	1.00-9.99	1000
Naphthalene	91-20-3	1.00-2.99	100
Styrene	100-42-5	1.00-2.99	1000
Toluene	108-88-3	1.00-79.99	1000
Xylenes	1330-20-7	3.00-19.99	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Benzene	CT, FL, IL, MA, NJ, PA, RI, MI
Dicyclopentadiene	CT, FL, MA, NJ, PA, RI
Ethylbenzene	CT, FL, IL, MA, NJ, PA, RI
Naphthalene	CT, FL, IL, MA, NJ, PA, RI
Styrene	CT, FL, IL, MA, NJ, PA, RI, MI
Toluene	CT, FL, IL, MA, NJ, PA, RI, MI
Xylenes	CT, FL, IL, MA, NJ, PA, RI, MI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Benzene	71-43-2
Toluene	108-88-3

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class B, Div 2: Flammable liquid
Class D, Div 2, Subdiv A: Carcinogenic
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
Not determined

Japan Inventory Status:
Not determined

MSDS CODE AND NAME	:	*PYGAS1 PYROLYSIS GASOLINE*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

DO NOT USE THIS PRODUCT AS A SOLVENT.

"SKIN" notation in Section 2 indicates possible adverse health effects as a result of absorption through the skin, mucous membranes and eyes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	**:**	***REFORMAT REFORMATE***
DATE ISSUED	**:**	**7/1/2004**
DATE PRINTED	**:**	**7/1/2004**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

REFORMAT REFORMATE

Chemical Name and/or Family or Description:

Light aromatic hydrocarbon mixture

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (800) 328-8501
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA__X__ IARC__X__ NTP__X__ OTHER__X__ NONE____

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Benzene	71-43-2	0.5 ppm TWA ACTION LIMIT-OSHA 1.0 ppm TWA-OSHA 5.0 ppm STEL-OSHA 25 ppm CIELING LIMIT-OSHA (Subject to 29 CFR 1910.1028) 0.5 ppm TWA-ACGIH (A1) (SKIN) 2.5 ppm STEL-ACGIH	15.00-64.99
Toluene	108-88-3	200 ppm TWA-OSHA 300 ppm CEILING-OSHA 50 ppm TWA-ACGIH (A3) (SKIN)	0.05-25.99
Ethylbenzene	100-41-4	100 ppm TWA-OSHA 100 ppm TWA-ACGIH	0.01-9.99

MSDS CODE AND NAME	: ***REFORMAT***	***REFORMATE***
DATE ISSUED	: **7/1/2004**	
DATE PRINTED	: **7/1/2004**	
COMPANY	: **HUNTSMAN**	

		125 ppm STEL-ACGIH	
Xylenes	1330-20-7	100 ppm TWA-OSHA 100 ppm TWA-ACGIH 150 ppm STEL-ACGIH	0.01-9.99

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

Odor:

Aromatic

WARNING STATEMENT

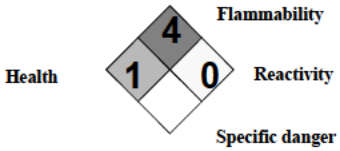
DANGER ! EXTREMELY FLAMMABLE LIQUID AND VAPOR
VAPOR MAY CAUSE FLASH FIRE
MAY CAUSE DIZZINESS AND DROWSINESS
MAY CAUSE SKIN IRRITATION
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
CAN CAUSE DAMAGE TO LIVER, KIDNEY, AND BLOOD FORMING ORGANS

ATTENTION ! CONTAINS BENZENE - CANCER HAZARD
CONTAINS TOLUENE - WHICH MAY CAUSE NERVOUS SYSTEM DAMAGE
BASED ON ANIMAL DATA

Hazardous Material Information System (United States)

Health	2
Fire	4
Reactivity	0
Personal protection	

National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause minimal irritation, experienced as temporary discomfort.

Skin: May cause irritation with discomfort, and seen as local redness and possible swelling. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort. Prolonged, widespread, or repeated skin contact may result in the absorption of potentially harmful amounts of material. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

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Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur. Aspiration may occur during swallowing or vomiting resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Prolonged and repeated overexposure to toluene at excessive concentrations encountered upon substance abuse (i.e. addictive sniffing) may cause nervous system effects, experienced as euphoria, hallucinations, behavior changes, double vision, difficulty walking, convulsions, and coma. Permanent psychological disturbances have also been described.

Prolonged and repeated overexposure to benzene may cause headaches, loss of appetite, rapid pulse, fatigue, liver and kidney damage, decreased bone-marrow activity with increased bleeding tendencies, and possible irreversible injury to blood forming organs. Prolonged and repeated overexposure to benzene has been associated with aplastic anemia and acute myelogenous leukemia in humans.

Medical Conditions Aggravated by Exposure:

Overexposure may aggravate existing blood disorders, such as anemia. Repeated overexposure may aggravate existing liver or kidney disease. Repeated overexposure may aggravate or enhance existing nervous system dysfunction.

Other Remarks:

None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water until all traces of material are removed. Remove and clean contaminated clothing and shoes. Get medical attention if skin irritation persists or skin contact has been prolonged.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.) but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

Overexposure to this material may sensitize the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to overexposed individuals. Contact a Poison Control Center for further treatment information.

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5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

<-17 (<1.4°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: Not determined.
Upper: Not determined.

Recommended Fire Extinguishing Agents And Special Procedures:

Fight fire from protected location or maximum possible distance. Use dry chemical, foam, carbon dioxide, or water spray. Use water spray to cool fire-exposed containers.

Unusual or Explosive Hazards:

Danger! Extremely flammable materials may release vapors that travel long distances, ignite, and flash back. Containers may explode in a fire. Do not expose to heat, sparks, flame, static, or other sources of ignition. When handling, use non-sparking tool, ground and bond all containers.

Containers may explode in fire.

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Barricade the immediate hazard area. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapor. Avoid contact with skin, eyes, or clothing. Pressure demand air supplied respirators should always be worn when the airborne concentration of the contaminant or oxygen is unknown. Otherwise, wear respiratory protection and other personal protective equipment as appropriate for the potential exposure hazard. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Keep away from heat, sparks or flame.
Avoid breathing vapor, mist, or gas.
Avoid contact with eyes, skin, and clothing.
Use only with adequate ventilation.
Keep container closed.
Wash thoroughly after handling.
Use spark-proof tools.
Material may be at elevated temperatures and/or pressures.
Exercise care when opening bleeders and sampling ports.

Storage:

Ground and bond shipping container, transfer line, and receiving container.
Keep away from heat, sparks, flame, and other sources of ignition.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Protective clothing such as coveralls or lab coats should be worn. Gloves resistant to chemicals and petroleum distillates should be worn. Exposed workers should wash exposed skin several times daily with soap and water. Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, if applicable (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% in confined spaces or other work areas (OSHA value).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Aromatic

Boiling Point (degrees C):

37-65 (98.6-149°F)

Melting/Freezing Point (degrees C):

Not determined.

Specific Gravity (water=1):

0.70 - 0.87

pH:

Not applicable.

Vapor Pressure:

>50 mmHg at 20°C (68°F)

Viscosity:

<5.0 cSt at 37.8°C (100°F)

VOC Content:

Not determined.

Vapor Density (Air=1):

>1

Solubility in Water (%):

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<0.1 [Insoluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat__X__ Strong Oxidizers__X__ Others____ None of these____

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 5.00 g/kg (rat) practically non-toxic
Inhalation:
Not determined.
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 3.00 - 5.00 /8.0 (rabbit) moderately irritating
Eyes:
(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect
Sensitization:
Not determined.

Other:

Benzene:
Prolonged and repeated exposure to benzene has caused anemia, lymphoma, and other cancers, in laboratory animals. Benzene has been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (i.e., illness in the mother).

Ethylbenzene Carcinogenicity:
A preliminary report from a chronic (lifetime) inhalation exposure study in rats and mice exposed to ethylbenzene (EB) has been recently released by the National Toxicology Program (NTP), the sponsor of the study. In this study, rats and mice (both sexes) were exposed to EB vapors at 75, 250 or 750 parts per million (ppm). In this study, male rats showed an increased incidence of kidney tumors (renal tubule adenoma or carcinoma) and testicular tumors (interstitial cell adenoma), and female rats showed an increase in kidney tumors (renal tubule adenoma). Male mice showed an increase in lung tumors (alveolar/bronchial neoplasms) and female mice showed an incidence of liver tumors (hepatocellular neoplasms). For all of the above tumors, the tumor incidence was significantly increased only at the highest exposure level of 750 ppm. In their preliminary report, NTP has concluded that there is "clear evidence" of cancer in male rats, and "some evidence" of cancer in female rats, and male and female mice.

These study findings were quite unexpected, both by NTP and industry scientists, since the results from previously-conducted subchronic exposure studies gave no indication of a potential carcinogenic effect from exposures to EB. In addition, genotoxicity studies conducted on EB have consistently shown that EB is not genotoxic.

The relevance (if any) of these tumors to humans is not known. The ACC Ethylbenzene Panel, as well as NTP, is sponsoring additional investigations to determine the possible mechanisms of EB toxicity/carcinogenicity and the relevance of these mechanisms to human carcinogenicity.

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Other ethylbenzene chronic effects:
Prolonged and repeated exposure of laboratory animals to high levels of ethylbenzene via inhalation or ingestion has cause liver and kidney effects as well as central nervous system depression. Ethylbenzene has also been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (e.g. illness in the mother).

Xylene:
Prolonged and repeated exposure of laboratory animals to high levels of xylene via inhalation or ingestion has caused liver and kidney effects as well as central nervous system depression. Inhalation of high concentrations has also caused hearing loss in some animal studies. Xylene has also been shown to cause embryo/fetal toxicity and birth defects in laboratory animals, but only at doses which cause maternal toxicity (e.g. illness in the mother).

Toluene:
Prolonged and repeated exposure of laboratory animals to toluene vapors has caused permanent hearing loss.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product (as presently constituted) has the RCRA classification of benzene toxicity and ignitability. If discarded in its present form, it would have the hazardous waste numbers D018 and D001 respectively. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may change the classification to non-hazardous, or hazardous for reasons other than, or in addition to benzene toxicity and ignitabilty.

Remarks:

Do not allow to enter drains or sewers. Can cause explosion.

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Hydrocarbons, liquid, n.o.s. (Benzene, Toluene)

Hazard Class:
3

Identification Number:
UN3295

Packing Group:
II

Label Required:
FLAMMABLE LIQUID

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
HYDROCARBONS, LIQUID, N.O.S. (benzene, toluene)

Hazard Class
3

Identification Number
UN3295

Packing Group
II

Label Required

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Flammable liquids

ICAO

Proper Shipping Name:
Hydrocarbons, liquid, n.o.s. (Benzene, Toluene)

Hazard Class
3

Identification Number
UN3295

Packing Group
II

Label Required
Flammable liquid

TDG

Proper Shipping Name:
FLAMMABLE LIQUIDS, N.O.S. (Benzene, Toluene)

Hazard Class:
3.1

Identification Number:
UN1993

Packing Group:
II

Label Required:
Flammable liquid

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire__X__ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Benzene	71-43-2	50.00-64.99
Toluene	108-88-3	10.00-19.99
Xylenes	1330-20-7	3.00-9.99
Ethylbenzene	100-41-4	3.00-9.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Benzene	71-43-2	50.00-64.99	10
Toluene	108-88-3	10.00-19.99	1000
Xylenes	1330-20-7	3.00-9.99	100
Ethylbenzene	100-41-4	3.00-9.99	1000

States Right-to-Know Regulations:

Chemical Name	State Right-to-know

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Benzene	CT, FL, IL, MA, NJ, PA, RI, MI
Toluene	CT, FL, IL, MA, NJ, PA, RI, MI
Ethylbenzene	CT, FL, IL, MA, NJ, PA, RI
Xylenes	CT, FL, IL, MA, NJ, PA, RI, MI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Benzene	71-43-2
Toluene	108-88-3

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Class D, Div 2, Subdiv A: Carcinogenic
Class D, Div 2, Subdiv B: Irritant
Class B, Div 2: Flammable liquid

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
Not determined.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

Not determined.

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

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16. OTHER INFORMATION 7/1/2004

"SKIN" notation in Section 2 indicates possible adverse health effects as a result of absorption through the skin, mucous membranes and eyes, by contact with vapor, mist, spray or liquid. Appropriate measures should be taken to minimize contact.

Huntsman recommends that all exposures to this product be minimized by strictly adhering to recommended occupational controls procedures to avoid any potential adverse health effects.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

CALABRIAN CORPORATION

Material Safety Data Sheet

SULFUR DIOXIDE #4157

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Sulfur Dioxide
Chemical Formula: SO_2
CAS Number: 007446-09-5
Other Designations: Sulfurous acid anhydride, sulfurous anhydride, sulfurous oxide.
General Use: Chemical feedstock, food preservative, fumigating pesticide.
Manufacturer: Calabrian Chemical Corporation
5500 Hwy. 366
Port Neches, Texas 77651
Tel: 409 / 727-1471
Fax: 409 / 727-5803
Emergency No. 800 / 424-9300
CHEMTREC

Section 2 - Composition / Information on Ingredients

Composition	TWA	STEL	IDLH	CAS Number	% wt *or* vol
Sulfur Dioxide	2 ppm 5 mg/m³	5 ppm 10 mg/m³	100 ppm	007446-09-5	100 %
Ingredient Name					
Sulfur	*	*	*	007704-34-9	50 %
Oxygen	*	*	*	007782-44-7	50 %
Trace Impurities					

* none established.

Section 3 - Hazards Identification

***** **Emergency Overview** *****

Warning Statement: Warning! Harmful if inhaled.
Hazard Rating: Health = 3, Fire = 0, Reactivity = 0, PPE - Sec. 8
Primary Entry Routes: Inhalation
Target Organs: Respiratory system, eyes, skin
Acute Effects: Acute poisoning from sulfur dioxide is rare because the gas is easily detected. It is so irritating that contact cannot be tolerated. Symptoms include coughing, hoarseness, sneezing, tearing, and breathing difficulty. However, workers who cannot escape high accidental exposure may suffer severe pulmonary damage which can be fatal.

Inhalation: Irritant
Eye: Irritant
Skin: Irritant
Ingestion: Not likely to occur

Carcinogenicity: IARC, NTP, and OSHA do not list Sulfur Dioxide as a carcinogen.
Chronic Effects: Prolonged or repeated exposure may cause inflammation of the lining of the nose, dry throat and cough. Respiratory tract symptoms have been observed similar to changes observed in human chronic bronchitis.
Medical Conditions Aggravated by Long-Term Exposure: None indicated.

Section 4 - First Aid Measures

Exposure Route	Symptom	Treatment
Inhalation:	Concentrations above 0.3 ppm can be detected by humans, 5-10 ppm cause irritation of nose and	Remove from exposure to fresh air. Seek medical attention in severe cases or if recovery is not rapid.

	throat. Higher concentrations cause irritant cough.	
Eye Contact:	Burning, scratching sensation. Concentrations of 20 ppm irritates the eyes. Liquid causes corneal burns.	Irrigate with water until no evidence of chemical remains. Obtain medical attention.
Skin Contact:	Irritation, itching. Concentrations of 10,000 ppm is an irritant to moist areas of the skin within a few minutes of exposure. Contact with liquid causes burns (frostbite).	Wash with soap and drench with water. Remove contaminated clothing and wash before reuse.
Ingestion:	Liquid burns mouth, and gastric tract. Ingestion is not likely to occur.	Wash mouth and drink water. Do not induce vomiting.

After first aid, get appropriate medical attention.

Note to physician: Exposure may aggravate acute or chronic asthma, emphysema and bronchitis.
Special Precautions/Procedures: None indicated.

Section 5 - Fire-Fighting Measures

Flash Point: Not combustible.
Flash Point Method: Not Applicable.
Burning Rate: Not Applicable.
Autoignition Temperature: Not Applicable.
LEL: Not Applicable.
UEL: Not Applicable.
Flammability Classification: Not Flammable.
Extinguishing Media: Use extinguishing agent appropriate for surrounding fire conditions.
Unusual Fire or Explosion Hazards: None indicated.
Hazardous Combustion Products: May release hazardous gas.
Fire-Fighting Instructions: Do not release runoff from fire control methods to sewers or waterways.
Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full face piece operated in pressure-demand or positive-pressure mode.

Section 6 - Accidental Release Measures

Spill / Leak Procedures: Wear appropriate PPE - See Section 8.
Small Spills / Leaks: Spills can be neutralized with an alkaline material such as caustic soda. Leaks may be located by spraying the area with ammonium hydroxide solution which forms a white fume in the presence of sulfur dioxide.
Large Spills / Leaks: Large spills should be handled according to a predetermined plan.
Containment: For large spills, dike far ahead of contaminated runoff for later disposal.

Section 7 - Handling and Storage

Handling Precautions: Avoid contact with product.
Storage Requirements: Avoid heat or moisture. Store in properly designed pressure vessels, away from heat and

protected from physical damage. Segregate from combustible materials.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls
Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA limits (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at the source.

Administrative Controls
Respiratory Protection: Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Protective Clothing / Equipment: Wear protective gloves, boots, and clothing to prevent prolonged or repeated skin contact. Wear protective eyeglasses or goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
Safety Stations: Make emergency eyewash stations, showers, and washing facilities available in the work area.
Contaminated Equipment: Separate contaminated work clothes from street clothes. Remove this material from shoes and clean personal protective equipment.
Comments: Do not eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before food or beverage consumption.

Section 9 - Physical and Chemical Properties

Physical State:	Liquid or gas	**Water Solubility:**	11g/100g H_2O
Appearance:	Colorless	**Other Solubilities:**	NA
Odor Threshold:	0.5 ppm; pungent.	**Boiling Point:**	-10 C; 14 F.
Vapor Pressure:	2475 mm HG @ 20 C.	**Freezing Point:**	-75.5 C; -104 F.
Vapor Density (Air=1):	2.26 @ 20 C.	**% Volatile:**	NA
Formula Weight:	64.07	**Evaporation Rate:**	Rapid.
Density:	NA	**pH:**	Acidic.
Specific Gravity (H_2O=1):	1.36 @ 25 C.		

Section 10 - Stability & Reactivity

Stability: Stable under normal conditions.
Polymerization: Hazardous polymerization will not occur.
Chemical Incompatibilities: Contact with powdered potassium, sodium metals, alkali, and oxidizing agents produce violent reactions. Reacts with water and steam to form corrosive sulfurous acid. Reacts with chlorates to form unstable chlorine dioxide.
Conditions to Avoid: Avoid excessive heat, or open flame.
Hazardous Decomposition Products: May release hazardous gas.

Section 11 - Toxicological Information

Eye Effects (rabbit): Mild (6 ppm/4H/32D) **Acute Inhalation Effects (rat):** LC_{50} = 2520 ppm (1H)
Skin Effects: Not available. **Acute Oral Effects:** Not available.
Carcinogenicity: IARC, NTP, and OSHA do not list Sulfur Dioxide as a carcinogen.
Chronic Effects: Prolonged or repeated exposure may cause inflammation of the lining of the nose, dry throat and

cough. Respiratory tract symptoms have been observed similar to changes observed in human chronic bronchitis.

Section 12 - Ecological Information

Ecotoxicity: Sulfur Dioxide is a poisonous gas commonly used as a fumigant pesticide. Concentrations above 1 ppm are believed to be injurious to plant foliage.

Environmental Fate

Environmental Transport: Airborne gas.

Environmental Degradation: Rapid evaporation.

Soil Absorption/Mobility: Slight.

Section 13 - Disposal Considerations

Disposal: Absorbed sulfur dioxide solutions may be oxidized to inert sulfate salts for disposal.

Disposal Regulatory Requirements: Follow applicable Federal, state and local regulations.

Container Cleaning and Disposal: Follow applicable Federal, state and local regulations.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name:	Sulfur Dioxide, Liquified
Shipping Symbols:	Poison Gas
Hazard Class:	2.3
Subsidiary Hazard:	NA
ID No.:	UN 1079
Packing Group:	NA
Label:	Poison Gas
Special Provisions:	This material is poisonous by inhalation and has been assigned Special Provision #3 in 49 CFR 172.101.

Section 15 - Regulatory Information

EPA Regulations:

RCRA Hazardous Waste Classification (40 CFR 261): Characteristically corrosive

RCRA Hazardous Waste Number (40 CFR 261): D002.

CERCLA Hazardous Substance (40 CFR 302.4): Not listed.

CERCLA Reportable Quantity (RQ): NA

SARA Title III: Section 302 Extremely Hazardous Substance; RQ=1 lb.
Section 313 Toxic Chemical: Not listed.

FIFRA: Regulated when used as a pesticide.

OSHA Regulations:

Air Contaminant (29 CFR 1910.1000): Listed without ceiling or skin designation.

OSHA Specifically Regulated Substance: List of Highly Hazardous Chemicals TQ=1000 lb.

Other Regulations:

FDA: Regulated when used as a food preservative.

CALABRIAN CORPORATION

Material Safety Data Sheet

SULFUR DIOXIDE

Section 16 - Other Information

The information herein is believed to be reliable. However, no warranty, expressed or implied, is made as to its accuracy or completeness and none is made as to the fitness of this material for any purpose. The manufacturer shall not be liable for damages to person or property resulting from its use. Nothing herein shall be construed as a recommendation for use in violation of any patent.

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*N95 SURFONIC® N-95*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

N95 SURFONIC® N-95

Chemical Name and/or Family or Description:

Nonionic surfactant - alkylphenol ethoxylate

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Poly(oxy-1,2-ethanediyl), alpha-(nonylphenyl)-omega-hydroxy-	9016-45-9		100
Glycol ethers (fraction of product matching EPA definition)			1.00-2.99

MSDS CODE AND NAME	:	*N95 SURFONIC® N-95*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	HUNTSMAN

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Pale liquid

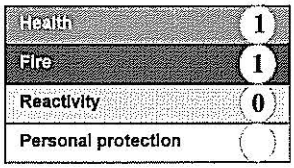
Odor:

Slight

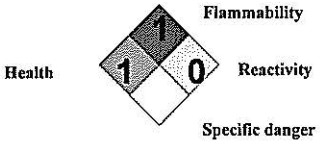
WARNING STATEMENT

CAUTION! MAY CAUSE EYE IRRITATION

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X **Skin** X **Inhalation** X **Ingestion**

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

None

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DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not applicable.

Flash Point (degrees C):

237.8 (460°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: Not determined.
Upper: Not determined.

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Contain spill if possible, contain with absorbent materials such as clay or soil, and shovel up. Avoid skin and eye contact.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Local exhaust ventilation recommended if generating vapor, dust, or mist. If exhaust ventilation is not available or inadequate, use MSHA or NIOSH approved respirator as appropriate.

Exposure Limit for the Total Product:

None established for product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Pale liquid

Odor:

Slight

Boiling Point (degrees C):

Not determined.

Melting/Freezing Point (degrees C):

5 (41°F)

Specific Gravity (water=1):

1.06

pH:

7

Vapor Pressure:

<1 mmHg at 20°C (68°F)

Viscosity:

110 cSt at 37.7°C (100°F)

VOC Content:

<1% by ASTM D 2369

Vapor Density (Air=1):

>1

Solubility in Water (%):

>10

Other:

MSDS CODE AND NAME	:	*N95 SURFONIC® N-95*
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COMPANY	:	**HUNTSMAN**

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others None of these X

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 3.31 g/kg (rat) slightly toxic
Dermal:
LD50 > 2.00 g/kg (rabbit) practically non-toxic
Inhalation:
Believed to be practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Eyes:
(Draize) 14.40 /110 (rabbit) slightly irritating
Skin:
(Draize) 1.04 /8.0 (rabbit) slightly irritating
Sensitization:
Not determined.

Other:

This product may contain residual (less than 100 ppm) concentrations of ethylene oxide. Ethylene oxide causes tumors in laboratory animals.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous. This material should be disposed of in accordance with local, state and federal regulations.

Remarks:

None

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DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Packing Group:
Not regulated.

Label Required:
Not regulated.

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
Residual ethylene oxide (typical)	75-21-8	0.001	1000	10

Section 311 Hazardous Categorization:

Acute X **Chronic** **Fire** **Pressure** **Reactive** **N/A**

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Glycol ethers (fraction of product matching EPA definition)		1.00-2.99

CERCLA 102(a)/DOT Hazardous Substances:

MSDS CODE AND NAME	:	***N95 SURFONIC® N-95***
DATE ISSUED	:	***7/1/2004***
DATE PRINTED	:	***7/1/2004***
COMPANY	:	***HUNTSMAN***

Chemical Name	CAS Number	Range in %	RQ
Glycol ethers (fraction of product matching EPA definition)		1.00-2.99	1
Residual ethylene oxide (typical)	75-21-8	0.001	10

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
None.	

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
Residual ethylene oxide (typical)	75-21-8

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:
Not regulated.

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is believed to be > 1.00 - 10.00 ppm (moderately toxic)

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

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COMPANY	:	*HUNTSMAN*

16. OTHER INFORMATION 7/1/2004

Ethoxylated products may contain residual amounts of ethylene oxide (EO) which can accumulate in the container headspace and be released into the ambient environment. This process is enhanced when the product is agitated, as during tank car loading and unloading, and blending operations. Ethylene oxide causes tumors in laboratory animals. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) for EO is 1 ppm for an eight-hour time weighted average exposure. The standard regulates occupational exposure to EO from all sources, including products containing residual EO. It is the responsibility of the employer to comply with OSHA ethylene oxide standard (29 CFR 1910.1047).

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980
THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*TEA85LFG TRIETHANOLAMINE-85%, LFG*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

TEA85LFG TRIETHANOLAMINE-85%, LFG

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC____ NTP____ OTHER____ NONE__X__

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2',2''-nitrilotris- (Common Name -Triethanolamine)	102-71-6	5 mg/m³ TWA-ACGIH	65.00-79.99
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	2 mg/m³ TWA-ACGIH (SKIN)	10.00-19.99
Water	7732-18-5		10.00-19.99

MSDS CODE AND NAME	: *TEA85LFG*	*TRIETHANOLAMINE-85%, LFG*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid

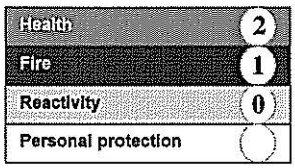
Odor:

Ammonia-like

WARNING STATEMENT

CAUTION ! MAY CAUSE EYE IRRITATION
MAY CAUSE BLOOD EFFECTS, LIVER, AND KIDNEY DAMAGE - BASED ON ANIMAL DATA
DO NOT ADD NITRITES - MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as discomfort or pain, and seen as excess redness and swelling of the eye, and possible injury to the cornea.

Skin: Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

None

MSDS CODE AND NAME	: ***TEA85LFG***	***TRIETHANOLAMINE-85%, LFG***
DATE ISSUED	: **7/1/2004**	
DATE PRINTED	: **7/1/2004**	
COMPANY	: **HUNTSMAN**	

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

>93.3 (>200°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: Not determined.
Upper: Not determined.

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

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DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles should be worn. Do not wear contact lenses.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid

Odor:

Ammonia-like

Boiling Point (degrees C):

Not determined.

Melting/Freezing Point (degrees C):

Not determined.

Specific Gravity (water=1):

1.12

pH:

11 [Basic]

Vapor Pressure:

0.01 mmHg at 20°C (68°F)

Viscosity:

525 cSt at 25°C (77°F)

MSDS CODE AND NAME	: *TEA85LFG*	*TRIETHANOLAMINE-85%, LFG*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

VOC Content:

Not determined.

Vapor Density (Air=1):

Not determined.

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat____ Strong Oxidizers____ Others__X__ None of these____

Comments:

This material may react violently with acids. This material is incompatible with strong oxidizing agents. This material is corrosive to copper, zinc, aluminum and thier alloys. Do not add or formulate with nitrites. See Section 16, OTHER INFORMATION.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 2.00 - 5.00 g/kg (rat) slightly toxic
Inhalation:
Believed to be practically non-toxic
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 25.00 - 50.00 /110 (rabbit) moderately irritating
Sensitization:
Not determined.

Other:

Triethanolamine Subchronic Toxicity:
Prolonged and repeated ingestion of Triethanolamine has caused kidney damage in laboratory animals.

Triethanolamine Carcinogenicity:
The National Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this study, female rats dermally exposed to TEA concentrations of up to 250 milligrams (mg) of TEA per kilogram (kg) of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 to 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule cell adenomas). Male mice dermally exposed to TEA concentrations of 200 to 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 to 1000 mg/kg/day showed an increased incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence" of cancer in female rats, "equivocal evidence" of kidney cancer in male rats, and due to infection of the study animals with Helicobacter hepaticus, the male and female mouse studies were considered to be "inadequate studies." Helicobacter hepaticus is a bacterial agent known to cause liver cancers in

infected animals.

The NTP has sponsored a repeat study in mice that are believed to be free of Helicobacter infection. This study is currently underway.

Diethanolamine Carcinogenicity:
In a chronic (two year) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) Alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans.

Diethanolamine Developmental and Reproductive Toxicity:
Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated for drums. For larger containers, consult MSDS (Section 14) and shipping papers for proper shipping description.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Packing Group:
Not regulated.

Label Required:
Not regulated.

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

MSDS CODE AND NAME	: *TEA85LFG*	*TRIETHANOLAMINE-85%, LFG*
DATE ISSUED	: 7/1/2004	
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COMPANY	: HUNTSMAN	

IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire____ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	10.00-19.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	10.00-19.99	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	CT, FL, IL, MA, NJ, PA, RI
Ethanol, 2,2',2"-nitrilotris- (Common Name - Triethanolamine)	FL, MA, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

MSDS CODE AND NAME	: ***TEA85LFG***	***TRIETHANOLAMINE-85%, LFG***
DATE ISSUED	: ***7/1/2004***	
DATE PRINTED	: ***7/1/2004***	
COMPANY	: ***HUNTSMAN***	

WHMIS Classification:
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

This product is expected to have low toxicity to aquatic species.

Mobility:

This product is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

The components of this product are readily biodegradable and are not expected to persist in the environment.

Potential to Bioaccumulate:

This product is not expected to bioaccumulate.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.
A component of this product carries "SKIN" notation in Section 2 as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin, mucous membranes, and eyes, by contact with vapor, mist, spray, or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980

MSDS CODE AND NAME	: ***TEA85LFG***	***TRIETHANOLAMINE-85%, LFG***
DATE ISSUED	: **7/1/2004**	
DATE PRINTED	: **7/1/2004**	
COMPANY	: **HUNTSMAN**	

THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*TEA85NF TRIETHANOLAMINE-85% NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

TEA85NF TRIETHANOLAMINE-85% NF

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC____ NTP____ OTHER____ NONE__X__

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2',2"-nitrilotris- (Common Name -Triethanolamine)	102-71-6	5 mg/m³ TWA-ACGIH	80.00-94.99
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	2 mg/m³ TWA-ACGIH (SKIN)	10.00-19.99

MSDS CODE AND NAME	:	*TEA85NF TRIETHANOLAMINE-85% NF*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid or moist white solid

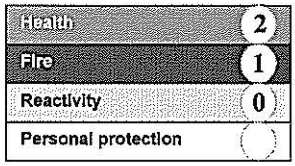
Odor:

Ammonia-like

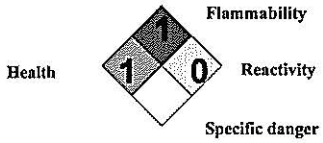
WARNING STATEMENT

CAUTION ! MAY CAUSE EYE IRRITATION
MAY CAUSE BLOOD EFFECTS, LIVER, AND KIDNEY DAMAGE - BASED ON ANIMAL DATA
DO NOT ADD NITRITES - MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as discomfort or pain, and seen as excess redness and swelling of the eye, and possible injury to the cornea.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

None

MSDS CODE AND NAME	: *TEA85NF*	*TRIETHANOLAMINE-85% NF*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

187.8 (370°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 9.8

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

MSDS CODE AND NAME	: *TEA85NF*	*TRIETHANOLAMINE-85% NF*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided. Store above 64°F (18°C) to prevent crystallization.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles should be worn. Do not wear contact lenses.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid or moist white solid

Odor:

Ammonia-like

Boiling Point (degrees C):

305 (581°F)

Melting/Freezing Point (degrees C):

18 (64.4°F)

Specific Gravity (water=1):

1.126

pH:

11 [Basic]

Vapor Pressure:

<0.01 mmHg at 20°C (68°F)

Viscosity:

527 cSt at 25°C (77°F)

MSDS CODE AND NAME	: *TEA85NF*	*TRIETHANOLAMINE-85% NF*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

VOC Content:

3% by ASTM D 2369

Vapor Density (Air=1):

5.3

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat____ Strong Oxidizers____ Others__X__ None of these____

Comments:

This material may react violently with acids. This material is incompatible with strong oxidizing agents. This material is corrosive to copper, zinc, aluminum and thier alloys. Do not add or formulate with nitrites. See Section 16, OTHER INFORMATION.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 2.00 - 5.00 g/kg (rat) slightly toxic
Inhalation:
Believed to be practically non-toxic
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 25.00 - 50.00 /110 (rabbit) moderately irritating
Sensitization:
Not determined.

Other:

Triethanolamine Subchronic Toxicity:
Prolonged and repeated ingestion of Triethanolamine has caused kidney damage in laboratory animals.

Triethanolamine Carcinogenicity:
The National Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this study, female rats dermally exposed to TEA concentrations of up to 250 milligrams (mg) of TEA per kilogram (kg) of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 to 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule cell adenomas). Male mice dermally exposed to TEA concentrations of 200 to 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 to 1000 mg/kg/day showed an increased incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence" of cancer in female rats, "equivocal evidence" of kidney cancer in male rats, and due to infection of the study animals with Helicobacter hepaticus, the male and female mouse studies were considered to be "inadequate studies." Helicobacter hepaticus is a bacterial agent known to cause liver cancers in

infected animals.

The NTP has sponsored a repeat study in mice that are believed to be free of Helicobacter infection. This study is currently underway.

Diethanolamine Carcinogenicity:
In a chronic (two year) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) Alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans.

Diethanolamine Developmental and Reproductive Toxicity:
Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated for drums. For larger containers, consult MSDS (Section 14) and shipping papers for proper shipping description.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Packing Group:
Not regulated.

Label Required:
Not regulated.

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

MSDS CODE AND NAME	: *TEA85NF*	*TRIETHANOLAMINE-85% NF*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire____ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	10.00-19.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	10.00-19.99	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	CT, FL, IL, MA, NJ, PA, RI
Ethanol, 2,2',2"-nitrilotris (Common Name - Triethanolamine)	FL, MA, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

MSDS CODE AND NAME	: *TEA85NF*	*TRIETHANOLAMINE-85% NF*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

WHMIS Classification:
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

This product is expected to have low toxicity to aquatic species.

Mobility:

This product is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

The components of this product are readily biodegradable and are not expected to persist in the environment.

Potential to Bioaccumulate:

This product is not expected to bioaccumulate.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.
A component of this product carries "SKIN" notation in Section 2 as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin, mucous membranes, and eyes, by contact with vapor, mist, spray, or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980

MSDS CODE AND NAME	: *TEA85NF*	*TRIETHANOLAMINE-85% NF*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

TEA85 TRIETHANOLAMINE-85%, TEA-85

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC____ NTP____ OTHER____ NONE__X__

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2',2"-nitrilotris- (Common Name -Triethanolamine)	102-71-6	5 mg/m³ TWA-ACGIH	80.00-94.99
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	2 mg/m³ TWA-ACGIH (SKIN)	10.00-19.99

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid or moist white solid

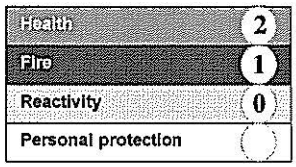
Odor:

Ammonia-like

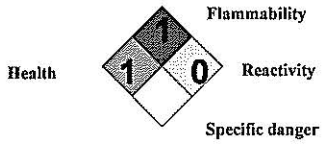
WARNING STATEMENT

CAUTION ! MAY CAUSE EYE IRRITATION
MAY CAUSE BLOOD EFFECTS, LIVER, AND KIDNEY DAMAGE - BASED ON ANIMAL DATA
DO NOT ADD NITRITES - MAY FORM SUSPECTED CANCER CAUSING NITROSAMINES

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation__X__ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as discomfort or pain, and seen as excess redness and swelling of the eye, and possible injury to the cornea.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

None

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

187.8 (370°F) (PMCC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 9.8

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided. Store above 64°F (18°C) to prevent crystallization.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles should be worn. Do not wear contact lenses.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid or moist white solid

Odor:

Ammonia-like

Boiling Point (degrees C):

305 (581°F)

Melting/Freezing Point (degrees C):

18 (64.4°F)

Specific Gravity (water=1):

1.126

pH:

11 [Basic]

Vapor Pressure:

<0.01 mmHg at 20°C (68°F)

Viscosity:

527 cSt at 25°C (77°F)

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

VOC Content:

3% by ASTM D 2369

Vapor Density (Air=1):

5.3

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat____ Strong Oxidizers____ Others__X__ None of these____

Comments:

This material may react violently with acids. This material is incompatible with strong oxidizing agents. This material is corrosive to copper, zinc, aluminum and thier alloys. Do not add or formulate with nitrites. See Section 16, OTHER INFORMATION.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 2.00 - 5.00 g/kg (rat) slightly toxic
Inhalation:
Believed to be practically non-toxic
Dermal:
LD50 Believed to be > 2.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 25.00 - 50.00 /110 (rabbit) moderately irritating
Sensitization:
Not determined.

Other:

Triethanolamine Subchronic Toxicity:
Prolonged and repeated ingestion of Triethanolamine has caused kidney damage in laboratory animals.

Triethanolamine Carcinogenicity:
The National Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this study, female rats dermally exposed to TEA concentrations of up to 250 milligrams (mg) of TEA per kilogram (kg) of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 to 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule cell adenomas). Male mice dermally exposed to TEA concentrations of 200 to 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 to 1000 mg/kg/day showed an increased incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence" of cancer in female rats, "equivocal evidence" of kidney cancer in male rats, and due to infection of the study animals with Helicobacter hepaticus, the male and female mouse studies were considered to be "inadequate studies." Helicobacter hepaticus is a bacterial agent known to cause liver cancers in

infected animals.

The NTP has sponsored a repeat study in mice that are believed to be free of Helicobacter infection. This study is currently underway.

Diethanolamine Carcinogenicity:
In a chronic (two year) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) Alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans.

Diethanolamine Developmental and Reproductive Toxicity:
Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated for drums. For larger containers, consult MSDS (Section 14) and shipping papers for proper shipping description.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Packing Group:
Not regulated.

Label Required:
Not regulated.

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

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DATE ISSUED	:	*7/1/2004*
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COMPANY	:	*HUNTSMAN*

IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire____ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	10.00-19.99

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	10.00-19.99	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	CT, FL, IL, MA, NJ, PA, RI
Ethanol, 2,2',2"-nitrilotris (Common Name - Triethanolamine)	FL, MA, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

WHMIS Classification:
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

This product is expected to have low toxicity to aquatic species.

Mobility:

This product is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

The components of this product are readily biodegradable and are not expected to persist in the environment.

Potential to Bioaccumulate:

This product is not expected to bioaccumulate.

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.
A component of this product carries "SKIN" notation in Section 2 as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin, mucous membranes, and eyes, by contact with vapor, mist, spray, or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980

MSDS CODE AND NAME	:	*TEA85 TRIETHANOLAMINE-85%, TEA-85*
DATE ISSUED	:	7/1/2004
DATE PRINTED	:	7/1/2004
COMPANY	:	HUNTSMAN

THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

TEA99 TRIETHANOLAMINE-99%

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.
Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC____ NTP____ OTHER____ NONE__X__

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2',2"-nitrilotris- (Common Name - Triethanolamine)	102-71-6	5 mg/m³ TWA-ACGIH	99.00-99.90
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	2 mg/m³ TWA-ACGIH (SKIN)	0.10-1.00

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid or moist white solid

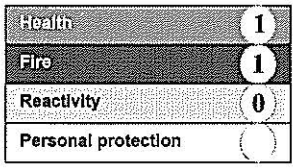
Odor:

Ammonia-like

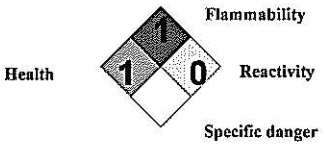
WARNING STATEMENT

CAUTION ! MAY CAUSE EYE IRRITATION
MAY CAUSE KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation____ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea.

Sensitization Properties: This product is not expected to be a human skin sensitizer based on animal data.

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing kidney disease.

Other Remarks:

None

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

201.7 (395°F) (CC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 8.5

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

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DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided. Store above 72°F (22°C) to prevent crystallization.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid or moist white solid

Odor:

Ammonia-like

Boiling Point (degrees C):

360 (680°F)

Melting/Freezing Point (degrees C):

21.1 (70°F)

Specific Gravity (water=1):

1.12

pH:

11 [Basic]

Vapor Pressure:

<0.01 mmHg at 20°C (68°F)

Viscosity:

527 cSt at 25°C (77°F)

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

VOC Content:

1% by ASTM D 2369

Vapor Density (Air=1):

5.3

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat____ Strong Oxidizers____ Others__X__ None of these____

Comments:

This material is incompatible with acids, organic anhydrides, isocyanates, vinyl acetate, acrylates, substituted allyls, alkylene oxides, epichlorohydrin, aldehydes, strong oxidizers. Corrodes copper and its alloys.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 2.00 - 5.00 g/kg (rat) slightly toxic
Inhalation:
Not determined.
Dermal:
LD50 > 10.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
(Buehler) Negative - skin (guinea pig)

Other:

Triethanolamine Subchronic Toxicity:
Prolonged and repeated ingestion of Triethanolamine has caused kidney damage in laboratory animals.

Triethanolamine Carcinogenicity:
The National Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this study, female rats dermally exposed to TEA concentrations of up to 250 milligrams (mg) of TEA per kilogram (kg) of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 to 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule cell adenomas). Male mice dermally exposed to TEA concentrations of 200 to 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 to 1000 mg/kg/day showed an increased incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence" of cancer in female rats, "equivocal evidence" of kidney cancer in male rats, and due to infection of the study animals with Helicobacter hepaticus, the male and female mouse studies were considered to be "inadequate studies." Helicobacter hepaticus is a bacterial agent known to cause liver cancers in

infected animals.

The NTP has sponsored a repeat study in mice that are believed to be free of Helicobacter infection. This study is currently underway.

Diethanolamine Carcinogenicity:
In a chronic (two year) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) Alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans.

Diethanolamine Developmental and Reproductive Toxicity:
Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated for drums. For larger containers, consult MSDS (Section 14) and shipping papers for proper shipping description.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Packing Group:
Not regulated.

Label Required:
Not regulated.

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire____ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	0.10-1.00

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	0.10-1.00	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2',2"-nitrilotris- (Common Name - Triethanolamine)	FL, MA, PA, RI
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

WHMIS Classification:
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

TEA is expected to have low toxicity to aquatic species.

Mobility:

TEA is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

TEA is readily biodegradable and is not expected to persist in the environment.

Potential to Bioaccumulate:

TEA is not expected to bioaccumulate (log K_{ow} = -1.75).

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.
A component of this product carries "SKIN" notation in Section 2 as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin, mucous membranes, and eyes, by contact with vapor, mist, spray, or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980

MSDS CODE AND NAME	:	*TEA99 TRIETHANOLAMINE-99%*
DATE ISSUED	:	*7/1/2004*
DATE PRINTED	:	*7/1/2004*
COMPANY	:	*HUNTSMAN*

THE WOODLANDS, TX 77387-4980

HUNTSMAN

MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT

MSDS CODE AND NAME	:	*TEA99NF*	*TRIETHANOLAMINE-99% NF*
DATE ISSUED	:	*7/1/2004*	
DATE PRINTED	:	*7/1/2004*	

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

MSDS CODE AND NAME

TEA99NF TRIETHANOLAMINE-99% NF

Chemical Name and/or Family or Description:

Alkanolamine

COMPANY INFORMATION

Huntsman Petrochemical Corporation
P.O. Box 4980
The Woodlands, TX 77387-4980

TELEPHONE NUMBERS
Transportation Emergency
Company: (409) 727-0831
CHEMTREC: (800) 424-9300
Medical Emergency: (409) 722-9673 (24 Hour)
General MSDS Assistance: (281) 719-6432
Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA____ IARC____ NTP____ OTHER____ NONE__X__

Composition:

Chemical Name	CAS Number	Exposure Limits	Range in %
Ethanol, 2,2',2"-nitrilotris- (Common Name - Triethanolamine)	102-71-6	5 mg/m³ TWA-ACGIH	99.00-99.90
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	2 mg/m³ TWA-ACGIH (SKIN)	0.10-1.00

MSDS CODE AND NAME	: *TEA99NF*	*TRIETHANOLAMINE-99% NF*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Clear liquid or moist white solid

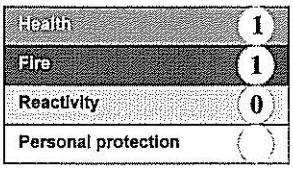
Odor:

Ammonia-like

WARNING STATEMENT

CAUTION ! MAY CAUSE EYE IRRITATION
MAY CAUSE KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)



National Fire Protection Association NFPA (United States)

POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye__X__ Skin__X__ Inhalation____ Ingestion____

Effects of Overexposure

Acute:

Eyes: May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Skin: Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: May cause abdominal discomfort, nausea, and diarrhea.

Sensitization Properties: This product is not expected to be a human skin sensitizer based on animal data.

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

Repeated overexposure may aggravate existing kidney disease.

Other Remarks:

None

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COMPANY	: **HUNTSMAN**	

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If patient is conscious and can swallow, give two glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

None

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

201.7 (395°F) (CC)

Flammable Limits % (Lower-Upper):

Lower: 1.3
Upper: 8.5

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear full protective clothing and positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

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COMPANY	: HUNTSMAN	

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided. Store above 72°F (22°C) to prevent crystallization.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet occupational exposure limits (see below).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Clear liquid or moist white solid

Odor:

Ammonia-like

Boiling Point (degrees C):

360 (680°F)

Melting/Freezing Point (degrees C):

21.1 (70°F)

Specific Gravity (water=1):

1.12

pH:

11 [Basic]

Vapor Pressure:

<0.01 mmHg at 20°C (68°F)

Viscosity:

527 cSt at 25°C (77°F)

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DATE ISSUED	: *7/1/2004*	
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VOC Content:

1% by ASTM D 2369

Vapor Density (Air=1):

5.3

Solubility in Water (%):

>10 [Soluble]

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air____ Water____ Heat____ Strong Oxidizers____ Others__X__ None of these____

Comments:

This material is incompatible with acids, organic anhydrides, isocyanates, vinyl acetate, acrylates, substituted allyls, alkylene oxides, epichlorohydrin, aldehydes, strong oxidizers. Corrodes copper and its alloys.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > 2.00 - 5.00 g/kg (rat) slightly toxic
Inhalation:
Not determined.
Dermal:
LD50 > 10.00 g/kg (rabbit) practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > .50 - 3.00 /8.0 (rabbit) slightly irritating
Eyes:
(Draize) Believed to be 15.00 - 25.00 /110 (rabbit) slightly irritating
Sensitization:
(Buehler) Negative - skin (guinea pig)

Other:

Triethanolamine Subchronic Toxicity:
Prolonged and repeated ingestion of Triethanolamine has caused kidney damage in laboratory animals.

Triethanolamine Carcinogenicity:
The National Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this study, female rats dermally exposed to TEA concentrations of up to 250 milligrams (mg) of TEA per kilogram (kg) of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 to 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule cell adenomas). Male mice dermally exposed to TEA concentrations of 200 to 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 to 1000 mg/kg/day showed an increased incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence" of cancer in female rats, "equivocal evidence" of kidney cancer in male rats, and due to infection of the study animals with Helicobacter hepaticus, the male and female mouse studies were considered to be "inadequate studies." Helicobacter hepaticus is a bacterial agent known to cause liver cancers in

infected animals.

The NTP has sponsored a repeat study in mice that are believed to be free of Helicobacter infection. This study is currently underway.

Diethanolamine Carcinogenicity:
In a chronic (two year) exposure study, sponsored by the National Toxicology Program (NTP), rats and mice were dermally exposed to Diethanolamine (DEA). Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice.

The American Chemistry Council (ACC) Alkanolamines Panel, with the cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigating the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA.

The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigating the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research program indicate that the tumors observed in the NTP mouse study resulted from a mechanism that is not relevant to humans.

Diethanolamine Developmental and Reproductive Toxicity:
Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Not regulated for drums. For larger containers, consult MSDS (Section 14) and shipping papers for proper shipping description.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Packing Group:
Not regulated.

Label Required:
Not regulated.

Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to Sections 2 and 14 of MSDS for composition and component RQ information.

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IMDG

Proper Shipping Name:
Not regulated.

ICAO

Proper Shipping Name:
Not regulated.

TDG

Proper Shipping Name:
Not regulated.

Hazard Class:
Not regulated.

Identification Number:
Not regulated.

Label Required:
Not regulated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:
Acute__X__ Chronic__X__ Fire____ Pressure____ Reactive____ N/A____

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	0.10-1.00

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	111-42-2	0.10-1.00	100

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2,2',2"-nitrilotris- (Common Name - Triethanolamine)	FL, MA, PA, RI
Ethanol, 2,2'-iminobis- (Common Name - Diethanolamine)	CT, FL, IL, MA, NJ, PA, RI

California Prop. 65:
The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:
This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

MSDS CODE AND NAME	: *TEA99NF*	*TRIETHANOLAMINE-99% NF*
DATE ISSUED	: *7/1/2004*	
DATE PRINTED	: *7/1/2004*	
COMPANY	: *HUNTSMAN*	

WHMIS Classification:
Class D, Div 2, Subdiv B: Irritant

Canadian Inventory Status:
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:
This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:
This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:
This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

TEA is expected to have low toxicity to aquatic species.

Mobility:

TEA is not expected to selectively partition and absorb to soil or sediments.

Persistence and Biodegradability:

TEA is readily biodegradable and is not expected to persist in the environment.

Potential to Bioaccumulate:

TEA is not expected to bioaccumulate (log K_{ow} = -1.75).

Remarks:

None

16. OTHER INFORMATION 7/1/2004

Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals.
A component of this product carries "SKIN" notation in Section 2 as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin, mucous membranes, and eyes, by contact with vapor, mist, spray, or liquid. Appropriate measures should be taken to minimize contact.

Date Issued: 7/1/2004.

HUNTSMAN
MANAGER, PRODUCT SAFETY
P.O. BOX 4980

MSDS CODE AND NAME	: *TEA99NF*	*TRIETHANOLAMINE-99% NF*
DATE ISSUED	: 7/1/2004	
DATE PRINTED	: 7/1/2004	
COMPANY	: HUNTSMAN	

THE WOODLANDS, TX 77387-4980

Midwest Biodiesel Products, Inc.
Safety Data Sheet

1. CHEMICAL PRODUCT

General Product Name: **Biodiesel (B100)**
Synonyms: Methyl Soyate, Rapeseed Methyl Ester (RME)
Product Description: Methyl esters from lipid sources
CAS Number: Methyl Soyate: 67784-80-9; RME: 73891-99-3;

---

2. COMPOSITION/INFORMATION ON INGREDIENTS

This Product contains no hazardous materials.

---

3. HAZARDS IDENTIFICATION

Potential Health Effects:

INHALATION:

Negligible unless heated to produce vapors. Vapors or finely misted materials may irritate the mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.

EYE CONTACT:

May cause irritation. Irrigate eye with water for at least 15 to 20 minutes. Seek medical attention if symptoms persist.

SKIN CONTACT:

Prolonged or repeated contact is not likely to cause significant skin irritation. Material is sometimes encountered at elevated temperatures. Thermal burns are possible.

INGESTION:

No hazards anticipated from ingestion incidental to industrial exposure.

---

4. FIRST AID MEASURES

EYES:

Irrigate eyes with a heavy stream of water for at least 15 to 20 minutes.

SKIN:

Wash exposed areas of the body with soap and water.

INHALATION:

Remove from area of exposure; seek medical attention if symptoms persist.

INGESTION:

Give one or two glasses of water to drink. If gastro-intestinal symptoms develop, consult medical personnel. *(Never give anything by mouth to an unconscious person)*

---

5. FIRE FIGHTING MEASURES

Flash Point (Method Used): 130.0 C or 266.0 F min (ASTM 93)
Flammability Limits: None known

EXTINGUISHING MEDIA:

Dry chemical, foam, halon (may not be permissible in some countries), CO_2, water spray (fog). Water stream may splash the burning liquid and spread fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Use water spray to cool drums exposed to fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Biodiesel soaked rags or spill absorbents (i.e. oil dry, polypropylene socks, sand, etc.) can cause spontaneous combustion if stored near combustibles and not handled properly.

Store biodiesel soaked rags or spill absorbents in approved safety containers and dispose mof properly. Oil soaked rags may be washed with soap and water and allowed to dry in well ventilated area. Firefighters should use self-contained breathing apparatus to avoid exposure to smoke and vapor.

---

6. ACCIDENTAL RELEASE MEASURES SPILL CLEAN-UP PROCEDURES

Remove sources of ignition, contain spill to smallest area possible. Stop leak if possible. Pick up small spills with absorbent materials and dispose of properly to avoid spontaneous combustion (see unusual fire and explosion hazards above). Recover large spills for salvage or disposal. Wash hard surfaces with safety solvent or detergent to remove remaining oil film. Greasy nature will result in a slippery surface.

---

7. HANDLING AND STORAGE

Store in closed containers between 50°F and 120°F.

Keep away from oxidizing agents, excessive heat, and ignition sources.

Store and use in well ventilated areas.

Do not store or use near heat, spark, or flame, store out of sun.

Do not puncture, drag, or slide this container.

Drum is not a pressure vessel; never use pressure to empty.

---

8. EXPOSURE CONTROL /PERSONAL PROTECTION

RESPIRATORY PROTECTION:

If vapors or mists are generated, wear a NIOSH approved organic vapor/mist respirator.

PROTECTIVE CLOTHING:

Safety glasses, goggles, or face shield recommended to protect eyes from mists or splashing. PVC coated gloves recommended to prevent skin contact.

OTHER PROTECTIVE MEASURES:

Employees must practice good personal hygiene, washing exposed areas of skin several times daily and laundering contaminated clothing before re-use.

---

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point, 760 mm Hg:>200°C Volatiles, % by Volume: <2

Specific Gravity (H_2O=1): 0.88 Solubility in H_2O, % by Volume: insoluble

Vapor Pressure, mm Hg: <2 Evaporation Rate, Butyl Acetate=1: <1

Vapor Density, Air=1:>1

Appearance and Odor: pale yellow liquid, mild odor

---

10. STABILITY AND REACTIVITY

GENERAL:

This product is stable and hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS:

Combustion produces carbon monoxide, carbon dioxide along with thick smoke.

DENNIS K. BURKE INC.
284 Eastern Ave. • P.O. Box 6069 • Chelsea, MA 02150
Telephone: (617) 884-7800 • Fax: (617) 884-7638

MATERIAL SAFETY DATA SHEET

FLEETLINE

PATRIOT B100 BIODIESEL

Additional copies of this MSDS can be obtained by calling 1-800-289-2875 or downloaded from our website at www.burkeoil.com

SECTION 1

PRODUCT INFORMATION

TRADE NAME (As used on label and list)
FLEETLINE
PATRIOT B100 BIODIESEL

CHEMICAL NAME/SYNONYMS
BIODIESEL

CHEMICAL FAMILY *CAS NUMBER*

PRODUCT CODE
B100, FLE 7781, FLE 7782

PREPARATION DATE
JUNE 15, 2002

24-HOUR EMERGENCY ASSISTANCE
CHEMTREC 1-800-424-9300
In case of an accident involving hazardous materials, the Chemical Transportation Emergency Center (CHEMTREC) which is a voluntary program of the Chemical Manufacturer's Association (CMA) operates a 24-hour nationwide telephone number which can be contacted for assistance.

NATIONAL EMERGENCY RESPONSE CENTER 1-800-424-8802

MASSACHUSETTS POISON INFORMATION CENTER (617) 232-2020

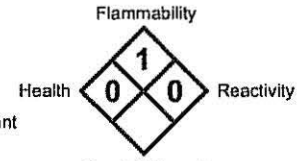
GENERAL ASSISTANCE
DENNIS K. BURKE, INC. 1-800-289-2875

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM (HMIS)

HEALTH	0
FLAMMABILITY	1
REACTIVITY	0
PROTECTION	0

NFPA FIRE HAZARD SYMBOL*

4 - Extreme
3 - High
2 - Moderate
1 - Slight
0 - Insignificant



SECTION 2

HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

DOES PRODUCT CONTAIN HAZARDOUS INGREDIENTS? ..... NO

DOES PRODUCT CONTAIN CARCINOGENS (NTP, IARC, or OSHA)? ..... NO

CHEMICAL/COMMON NAME	*CAS NUMBER*	*PERCENT*	*OSHA-PEL*	*ACGIH-TLV*
Biodiesel B100	–	100	–	–

This product does not contain toxic chemicals subject to the reporting requirements of SARA Title III, Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372).

SARA TITLE III INFORMATION

ACUTE HAZARD (Immediate Health) ..... NO

CHRONIC HAZARD (Delayed Health) ..... NO

FIRE HAZARD ..... YES

SUDDEN PRESSURE RELEASE HAZARD ..... NO

REACTIVITY HAZARD ..... NO

DOT REQUIREMENTS

DOT PROPER SHIPPING NAME
NONE

DOT HAZARD CLASS
NONE

DOT LABELS REQUIRED
NONE

DOT PLACARDS REQUIRED
NONE

SECTION 3

PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT ..... > 400°F

VAPOR PRESSURE (mm Hg) .... < 1.0

VAPOR DENSITY (AIR = 1) ..... NDA

SPECIFIC GRAVITY (WATER = 1) ... 0.86

MELTING POINT ..... NDA

EVAPORATION RATE (n-BUTYL ACETATE = 1) ..... NDA

SOLUBILITY IN WATER ..... Negligible

APPEARANCE AND ODOR – Yellow liquid with light cooking oil odor.

SECTION 4

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used) ..... PMCC = > 300°F

FLAMMABLE LIMITS ..... LEL = NDA UEL = NDA

EXTINGUISHING MEDIA – Dry chemical, CO2, Foam and Water Fog.

SPECIAL FIRE FIGHTING PROCEDURES – Use a water spray to cool fire-exposed containers, structures and to protect personnel.

If leak or spill has not ignited, ventilate area to protect personnel attempting to stop leak. Use water to flush spills away from sources of ignition.

(• continued on page 2)

NA = NOT APPLICABLE NDA = NO DATA AVAILABLE

MATERIAL SAFETY DATA SHEET

DENNIS K. BURKE, INC.

FLEETLINE
PATRIOT B100 BIODIESEL

SPECIAL FIRE FIGHTING PROCEDURES

(• continued from page 1)

Do not flush down public sewers or other drainage systems. Exposed firefighters must wear NIOSH/MSHA approved, self-contained, breathing apparatus with full face mask and protective clothing. Do not use a forced water stream directly on flames, as this will scatter the fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS – Dangerous when exposed to heat or flame. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire.

SECTION 5

REACTIVITY DATA

STABILITY ..... STABLE

CONDITIONS TO AVOID FOR STABILITY -- Avoid heat, sparks and open flames.

INCOMPATIBILITY (Materials To Avoid) -- This product may react with strong base to produce methanol.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS – This product does not decompose up to 350°F.

HAZARDOUS POLYMERIZATION ..... NONE

CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION . . . NA

SECTION 6

HEALTH HAZARD DATA

ROUTE(S) OF ENTRY – Inhalation, absorption and ingestion if hygienic practices are not observed.

HEALTH HAZARDS *(Acute And Chronic)*

EYE CONTACT – May produce a mild but transient irritation.

SKIN CONTACT – Very mild to no irritation expected.

DERMAL TOXICITY – Non-toxic to internal organs.

INHALATION OF PRODUCT – No harmful effects expected with normal use.

INHALATION OF EXHAUSE – No harmful effects expected with normal use.

INGESTION – May cause gastrointestinal irritation.

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT – Flush immediately with fresh water. Remove contact lenses if worn .Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

SKIN CONTACT – Remove contaminated clothes. Wash skin thoroughly with soap and water. Get medical attention if irritation persists.

INHALATION – Remove to fresh air.

INGESTION – If swallowed, do not induce vomiting. Get medical attention. Never give anything by mouth to an unconscious person.

NOTES TO PHYSICIAN – NDA

SECTION 7

PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED – Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can do it without risk. Keep unnecessary people away; isolate hazard area and deny entry. Isolate for half mile in all directions if tank truck, or tank is involved in fire. Water spray may reduce vapor but may not prevent ignition in closed spaces.

Although this product is not considered to be a water pollutant, releases of this product should be prevented from contaminating soil and water, and from entering drainage and sewer systems. Contain liquid to prevent further contamination of soil, surface water or groundwater.

Soak up small spills using absorbent material such as paper, rags, or sawdust and place into containers for later disposal. Dispose of any grease or oily material.

WASTE DISPOSAL METHODS – Place contaminated materials in disposal containers and dispose of in a manner consistent with applicable regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE – Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Material may be at elevated temperatures and/or pressures.

EMPTY CONTAINERS – Empty containers contain flammable residue. Do not cut, weld, reuse or dispose of containers unless precautions are taken against these hazards.

SECTION 8

CONTROL MEASURES

RESPIRATORY PROTECTION – NIOSH/MSHA approved self-contained breathing apparatus or supplied-air mask must be available for non-routine and emergency use. Ventilation may be used to control or reduce airborne concentrations.

VENTILATION

LOCAL EXHAUST ..... YES

MECHANICAL (General) ..... ACCEPTABLE

SPECIAL or OTHER ..... NA

SKIN PROTECTION – Wear nitrile gloves and protective clothing to prevent skin contact.

EYE PROTECTION – Wear safety glasses or chemical goggles to prevent eye contact. Have eye washing facility readily available where eye contact can occur.

WORK PRACTICES – Do not use or store near flame, sparks or hot surfaces. Keep container closed. Do not weld, heat or drill container. Do not use pressure to empty drum or explosion may result.

HYGIENIC PRACTICES – Launder soiled clothing. Wash thoroughly with soap and water after handling.

NA = NOT APPLICABLE NDA = NO DATA AVAILABLE

CAUSTIC SODA 50% (All Grades)

Material Safety Data Sheet

Emergency 24 Hour Telephone: CHEMTREC 800.424.9300

Corporate Headquarters: Hasa Inc.
23119 Drayton Street
Saugus, California 91350
Telephone • 661.259.5848
Fax • 661.259.1538

IDENTIFICATION OF PRODUCT	
Product Name:	Caustic Soda 50% (All Grades)
Product Synonym(s) Common Chemical Names:	Sodium Hydroxide Solution. See Miscellaneous Selection for all grades covered by this MSDS.
Chemical Names of Ingredients [>1.0% by weight]:	See Below.
Chemical Family:	Alkali
Chemical Formula:	NaOH
Chemical Name:	Sodium Hydroxide
Product Use:	Neutralizing agent; Degreasing agent

COMPOSITION/INFORMATION ON INGREDIENTS			
Ingredient Name	**CAS Registry Number**	**Typical Wt. %**	**OSHA**
Sodium Hydroxide	1310-73-2	50%	Y
Water	7732-18-5	50%	N
The substance (s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Communications Standard (29 CFR 1910.1200) This material is classified as hazardous under Federal OSHA regulation. The components of this product are all on the TSCA inventory list.			

HAZARDS IDENTIFICATION	
Emergency Overview:	Water white, clear to slightly turbid liquid. Essentially odorless.
DANGER!	CAUSES EYE, SKIN AND RESPIRATORY TRACT BURNS. MAY CAUSE BLINDNESS. CAUSE SEVERE DIGESTIVE TRACT BURNS. EVEN DILUTE SOLUTIONS MAY CAUSE BURNS.

Potential Heath Effects:
Skin contact and inhalation are expected to be the primary routes of occupational exposure to this material. This material is a strong alkali that can be destructive to tissue producing severe burns, possibly with deep ulceration and scarring, on contact with body tissues. Concentrations as low as 2-3 % can cause injury. Contact with the eyes can rapidly cause severe irritation or permanent injury, possibly with loss of sight. Solutions of this material may not produce an immediate sensation upon skin contact, delaying awareness of the fact that contact has occurred. Dermatitis (inflammation of the skin) and superficial skin damage can result from repeated or prolonged contact with very dilute solutions. High levels of dust or mists may be corrosive to mucous membranes producing eye or lung injury and chemical pneumonia. Lower concentrations may produce irritation of eyes, nose or upper respiratory tract with coughing, sore throat and shortness of breath. Prolonged exposure may result in ulceration of the nasal passages. While swallowing of this material is unlikely in the industrial setting, if swallowed, this material may cause severe injury, characterized by pain in the mouth and stomach, vomiting, and breathing difficulties. Due to the potential for this material to produce severe respiratory tract irritation, workers with lung disease or diminished respiratory capacity should have limited exposure to this material.

FIRST AID MEASURES	
IF CONTACTED:	IN CASE OF CONTACT, immediately flush with plenty of water for at least 30 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Destroy contaminated shoes.
IF SWALLOWED:	IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
IF INHALED:	IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention**.**

FIRE FIGHTING MEASURES		
Fire and Explosive Properties		
Auto-Ignition Temperature	NA	
Flash Point	NA	Flash Point Method
Flammable Limits – Upper	NA	
Lower	NA	

Extinguishing Media:	Use dry chemical. Do not use water to cool containers exposed to fire.
Fire Fighting Instructions:	Fire fighters and other who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.
Fire and Exposition Hazards:	Contact with metal can form hydrogen gas. Hydrogen is extremely flammable and can form explosive mixtures with air. Closed containers may explode when heated or contents contaminated with water.

ACCIDENTAL RELEASE MEASURES	
In Case of Spill or Leak:	Stop the leak, if possible. Ventilate the space involved. Contain, vacuum up, place in non-sparking container for disposal. Prevent waterway contamination. Construct a dike to prevent spreading. Collect run-off and transfer to drums or tanks for later disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

HANDLING AND STORAGE	
Handling:	Do not get in eyes, or skin or on clothing. Do not breathe mist. Keep container closed. Use only with adequate ventilation. Do not taste or swallow. Wash thoroughly after handling. To avoid rapid temperature rise, violent spattering, or explosive eruptions always add caustic to water when mixing. Never add water to a caustic when mixing. Heat water to 80-100 F before adding product. Add small amounts of product slowly and evenly over single addition, Water should not exceed 160° F during addition.
Storage:	Do NOT store near strong acids.

EXPOSURE CONTROLS/ PERSONAL PROTECTION	
Engineering Controls:	Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). Dilution ventilation acceptable, but local mechanical exhaust ventilation preferred, if practical, at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems. Monitor carbon monoxide and oxygen levels in tank and enclosed spaces.
Eye/ Face Protection:	Where there is potential for eye contact, wear a face shield, chemical goggles, and have eye-flushing equipment immediately available.
Skin Protection:	Natural rubber or Polyvinyl chloride gloves should be worn when handling this material. Wear chemical goggles, a face shield, and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing promptly and wash before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash skin thoroughly after handling.
Respiratory Protection:	Avoid breathing vapor or mist. Use NIOSSH approved respiratory protection equipment appropriate to the material and/ or its components when airborne exposure limits are exceeded (see below). Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full-face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR & 1910.134
Other Protective Equipment:	Rubber boots, Rubber suit or Apron, Chemical resistant protective clothing.

Airborne Exposure Guidelines for Ingredients:	
Exposure Limit	**Value**
Sodium Hydroxide	
ACGIH STEL	2 mg/m3
OSHA TWA PEL	2 mg/m3
- Only those components with exposure limits are printed in this section. - Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitative exposure. Measures to prevent significant cutaneous absorption may be required.	

PHYSICAL AND CHEMICAL PROPERTIES			
Appearance:	Water white, clear to slightly turbid liquid.	**Melting Point:**	NA
Odor:	Essentially odorless	**Freezing Point:**	-12° C (54° F)
pH:	NE	**Boiling Point:**	142° C (288° F)
Specific Gravity:	1.525 @ 20° C (Avg.)	**Solubility in Water:**	Complete
Vapor Pressure:	1.6 @ 20 C0	**Percent Volatile:**	50
Vapor Density:	NA	**Molecular Weight:**	40.01 (Dry Basis)

STABILITY AND REACTIVITY	
Stability:	This material is chemically stable under normal and anticipated storage and handling conditions.
Incompatibility:	Contact with water releases heat, which can result in violent boiling and spattering. Avoid strong acids, metals and organic material such as chlorinated hydrocarbons.
Hazardous Decomposition Products:	Explosive hydrogen gas can be liberated on contact with metals, such as zinc, tin or aluminum. Hydrogen gas can result in explosive hazards in confined spaces.

TOXICOLOGICAL INFORMATION

Data on this material and/or a similar material are summarized below.
Sodium Hydroxide Single exposure (acute) studies indicate that this material is slightly toxic to rabbits if absorbed through skin (LD 50 1,350 mg/Kg for dry material), and corrosive to rabbit eyes and skin. Many publications in the scientific literature confirm the severely irritating properties of acute and short-term exposure to this material in humans and animals and discuss toxic effects (such as a death, eye damage or changes in lung morphology), which are probably related to the corrosive properties of this compound. Inhalation of unmeasured concentrations 30 minutes per day for 2.5 months resulted in lung damage in rats. A rodent drinking water study at 1% (duration unknown) was reported to result in “nervous symptoms” and growth retardation. Growth was unaffected in this same study at 0.5 %, but no conceptions occurred. No tumors were seen in any longer term animal studies. This material produced no generic charges in standard tests using bacterial cells.

No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dusts for 30 years or more. Massive ingestion of this material has been implicated as causing esophageal cancer. Squamous cell carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of this material.

ECOLOGICAL INFORMATION	
Ecotoxicological Information:	Data on this material and/or a similar material are summarized below. Sodium Hydroxide. Data from several species of fish showed a range of tolerance (brook trout > spotfin and Lake Emerald shiners > minnows > mosquitofish > goldfish) that was most likely related to changes in the pH produced by addition of this material to the water. The minimum lethal concentration for minnows, Mayfly larvae and Daphnia was 100 ppm and for Chironomus larvae, 700 ppm.
Chemical Fate Information:	Data on this material and/or a similar material are summarized below. Sodium Hydroxide: No Data were available, but this material is a strong alkali that easily dissolves in water with resulting acid/base chemistry.

DISPOSAL CONSIDERATIONS	
Waste Disposal:	Consul with environmental engineer or professional to determine of neutralization is appropriate and for handling procedures for residual material. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulation.

TRANSPORT INFORMATION	
DOT Name:	Sodium Hydroxide Solution
DOT Hazard Class:	8
UN Number:	UN 1824
DOT Packing Group:	PG II
RQ:	1000 lbs
DOT Special Information:	Tank Trucks: Corrosive Placards Tank Cars: Placarded Corrosive

REGULATORY INFORMATION			
Hazard Categories Under Criteria of SARA Tile IIII Rules (40 CFR Part 370)			
Immediate (Acute) Health:	Yes	Fire:	No
Delayed Chronic Health:	No	Reactive:	No
Sudden Release of Pressure:	No		
The components of this product are all on the TSCA inventory list.			

Ingredient Related Regulatory Information:

SARA Reportable Quantities	**CERCLA RQ**	**SARA TPQ**
Sodium Hydroxide	1000 Lbs.	
Water	NE	

Massachusetts Right to know
This product does contain the following chemical (s), as indicated below, currently on the Massachusetts Right-to-Know Substances List.
Sodium Hydroxide

New Jersey Right to know
This product does contain the following chemical (s), as indicated below, currently on the New Jersey Right-to-Know Substances List.
Sodium Hydroxide

Pennsylvania Environmental Hazard
This product does contain the following chemical (s), as indicate below, currently on the Pennsylvania Environmental Hazard List.
Sodium Hydroxide.

Pennsylvania Right to Know
This product does contain the following chemical (s), as indicated below, currently on the Pennsylvania Hazardous Substance List.
Sodium Hydroxide.

OTHER INFORMATION			
Revision Information			
Revision Date		08.01.2001	Revision Number 1
Supercedes Revision Dated		07.20.1999	
Revision Summary		Initial Entry into 16 section format	
Key:	NE = Not Established	NA = Not Applicable	(R) Registered Trademark

Miscellaneous
NOTE: Toxic carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and cause death.

This MSDS covers the following grades:
50% Membrane Grade
50% High Purity Membrane Grade
50% Rayon Grade
50% Standard Grade
50% Chemical Grade
50% Bleach Grade
50% With Additive

Please Note: The information contained herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge and belief. NO WARRANTY OR GUARANTEE, expressed or implied, is made regarding the product performance, product stability, or as to any other condition of use, handling, transportation, and storage. Customer use, handling, transportation, and storage may involve additional safety and/or performance considerations. Our technical personnel will be happy to respond to questions regarding safe handling, storage, transportation and use procedures. The safe handling, storage, transportation and use procedures remain the sole responsibility of the customer. No suggestions for handling, storage, transportation or use are intended as or to be construed as recommendations which may infringe on any existing patents or violate any Federal, State, and/or local law and/or regulation, ordinance, standard, etc.. This Material Safety Data Sheet has been prepared by HASA, Inc. staff from test reports and other information available in the public domain.

GRIFFIN INDUSTRIES
A Tradition in Agri-Business Since 1943

Material Safety Data Sheet
Identity: Chicken Fat

Section I - General Information

Manufacturer's Name:
Griffin Industries, Inc.
4221 Alexandria Pike
Cold Spring, KY 41076

Emergency Telephone Number: (859) 472-7363
Telephone Number for Information: (859) 472-7363

Date Prepared: 3/19/07
Signature of Preparer: Thomas L. Dobbs

Section II - Hazardous Ingredients/Identity Information

Hazardous Components - Contains no Hazardous Components as described in the Hazard Communication Standard
Substance - Rendered Poultry Fat CAS Number N/A
Trade Names - Chicken Fat
Chemical Family: Triglyceride; Triacylglycerol
Molecular Formula: N/A Molecular Weight: N/A

Components and Contaminants

Components: Triglycerides Percent: 100%
Other Contaminants: None Exposure Limits: N/A

Section III - Physical/Chemical Characteristics

Boiling Point: Decomposes Specific Gravity (H20 = 1): 0.84 avg.
Vapor Pressure (mm Hg): N/A Melting Point: 35° C
Vapor Density (Air = 1): N/A Evaporation Rate: 0 (Butyl Acetate = 1)
Solubility in Water: Insoluble
Appearance and Odor: Light brown liquid to pale brown solid, bland odor

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Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used): 525° F, Open Cup
Flammable Limits: N/A LEL: N/A UEL: N/A
Extinguishing Media: Type B (Flammable Liquids)
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

Section V - Reactivity Data

Reactivity: Stable
Conditions to Avoid: None
Incompatibility (Materials to Avoid): None
Hazardous Decomposition or Byproducts: None
Hazardous Polymerization: Will Not Occur

Section VI - Health Hazard Data

Inhalation: N/A
Skin Contact: N/A
Eye Contact: N/A
Ingestion: N/A
Emergency and First Aid Procedures: Wash well, treat for possible heat burns
OSHA Regulated: No

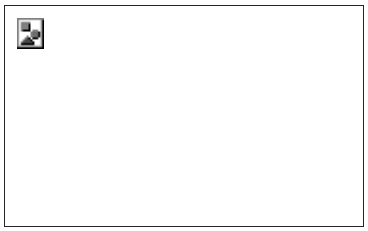
Section VII - Precautions for Safe Handling and Use

Steps to be taken in case material is released or spilled -
Contain and contact Griffin Industries, Inc. concerning reprocessing.
Waste Disposal Method - Rendering (reprocessing), not to be landfilled. Do not flush to sewer.
Precautions To Be Taken in Handling and Storing - None
Other Precautions - None

Section VIII - Control Measures

Respiratory Protection - None
Ventilation - Ventilate tanks before entering.
Protective Gloves - Standard
Eye Protection - Standard
Other Protective Clothing or Equipment - Standard
Work/Hygienic Practices - Standard

The information provided 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.



Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

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The Version Date and Number for this MSDS is : 12/02/2005 - #007

PRODUCT NAME: CITRIC ACID, SOLUTION

MSDS NUMBER: HX17030

DATE ISSUED: 11/21/2005

SUPERSEDES: 6/22/2005

ISSUED BY: 006768

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Material Safety Data Sheet

Section 1 - Chemical Product and Company Identification

Chemical Name: Citric Acid, Solution
Product Use: For Manufacturing Use
Synonyms: 1,2,3-Propanetricarboxylic acid, 2-hydroxy-; 2-Hydroxy-1,2,3-propanetricarboxylic acid; Propane-1,2,3-tricarboxylic acid, 2-hydroxy-; beta-hydroxytricarballylic acid.

Supplier Information
Distributed by:
UNIVAR USA
6100 Carillon Point
Kirkland, WA 98033
425-889-3400
Emergency: 1-800-424-9300 or (703)527-3887

General Comments: FOR MANUFACTURING USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service. * * * Section 2 - Composition / Information on Ingredients

CAS #	Component	Percent
77-92-9	Citric Acid	30-50%
7732-18-5	Water	Balance

Component Information/Information on Non-Hazardous Components
This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Section 3 - Hazards Identification

Emergency Overview
Citric Acid Solution is a clear or yellow to brown liquid, with a faint sugary odor. Citric Acid is moderately to severely irritating to eyes, and moderately irritating to skin, and respiratory tract. Citric Acid Solution is not combustible. Use methods suitable for containing (diking) the solution in case of fire or spill. Firefighters should wear full protective equipment when fighting a fire involving this product.

Hazard Statements
DANGER! THIS SOLUTION CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION OR BURNS. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not breath or ingest mists, vapors, or aerosols. Do not allow contact with eyes, skin, or clothing. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Potential Health Effects: Eyes
This solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations.

Potential Health Effects: Skin
This product may cause moderate irritation of the skin. Citric Acid may cause allergic contact dermatitis with prolonged or repeated contact in sensitive individuals.

Potential Health Effects: Ingestion
Citric Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, and abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Chronic ingestion of high concentration Citric Acid can result in erosion of tooth enamel. Repeated ingestion of this solution can result in sensitization to the sun, causing sunburn.

Potential Health Effects: Inhalation
Aerosols and mists from solutions may cause mild to moderate irritation of the nose and throat. Overexposure could cause coughing, sneezing, and labored breathing.

Other Potential Health Effects
Chronic, high concentration overexposure to Citric Acid can result in a reduction of plasma calcium concentration, which can lead to cardiac arrhythmias, reduced cardiac output and, in severe cases, death.

HMIS Ratings: Health Hazard: 2* Fire Hazard: 0 Physical Hazard: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Section 4 - First Aid Measures

First Aid: Eyes
Immediately flush the contaminated eye with plenty of water for 15 minutes. Get medical attention if symptoms of pain, swelling, or tearing exist after flushing the eyes.

First Aid: Skin
For skin contact, immediately wash extremely thoroughly with soap and water. Get medical attention if irritation develops or persists.

First Aid: Ingestion
DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Inhalation
Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician
There is no specific antidote. Care is symptomatic and supportive.

Section 5 - Fire Fighting Measures

Flash Point: Not applicable.
Method Used: Not applicable.
Upper Flammable Limit (UEL Not applicable.
Lower Flammable Limit (LEL): Not applicable.
Auto Ignition: Not applicable.
Flammability Classification: Not applicable.
Rate of Burning: Not applicable.
General Fire Hazards
Not considered flammable although if allowed to evaporate to dryness, residue may burn in presence of strong ignition source.

Hazardous Combustion Products
Applies to residue: Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

Extinguishing Media
Water, foam, dry chemical, or carbon dioxide. Dike and collect water used to fight fire; runoff may cause damage.

Fire Fighting Equipment/Instructions
Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other:
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Section 6 - Accidental Release Measures

Containment Procedures
Stop the flow of material, if this can be done without risk. Contain the discharged solution; dike runoff to prevent spill from contaminating storm drains, sewers, soil or groundwater waterways.

Clean-Up Procedures
Wear appropriate protective equipment and clothing during clean-up. Addition of sodium bicarbonate or lime (soda ash) will neutralize Citric Acid and precipitate calcium citrate. Test area of spill with pH paper to assure neutralization. Thoroughly wash the area after a spill clean-up with large quantities of water, flush to drain.

Evacuation Procedures
Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep incompatible materials away from spilled solution. In case of large spills, follow all facility emergency response procedures.

Special Procedures
Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

Section 7 - Handling and Storage

Handling Procedures
All employees who handle this material should be trained to handle it safely. Do not breathe vapors or mists. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures
Keep container tightly closed when not in use. Keep containers upright, do not drop, roll or skid. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire- and corrosion-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).
Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Wipe down area of use periodically as area can become sticky.

Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines
A: General Product Information
No exposure guidelines have been established.
B: Component Exposure Limits
ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

Engineering Controls
Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement.

PERSONAL PROTECTIVE EQUIPMENT
The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face
Faceshields and goggles should be worn when working with solutions of Citric Acid. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin
Use impervious gloves. Butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, or PVC are recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory
None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator with acid dust/mist pre-filters. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such

atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General
Have an eyewash fountain and safety shower available in the work area. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Wash hands thoroughly after handling material. Do not eat, drink, or smoke in work areas.

Section 9 - Physical & Chemical Properties

Physical Properties: Additional Information
The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	Colorless or yellow to brown
Odor:	Slight sugar odor.
Physical State:	Liquid
pH:	Approx 2.5 or lower
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Boiling Point:	104 deg C (219 deg F)
Melting Point:	Not applicable.
Solubility (H20):	162 g/100 mL water at 25 deg C
Specific Gravity:	1.24 @ 25 deg C (77 deg F)
Freezing Point:	0 deg C (32 deg F)
Particle Size:	Not applicable.
Softening Point:	Not applicable.
Evaporation Rate:	Similar to water.
Viscosity:	7.0 centipoise at 25 deg C
Bulk Density:	Not applicable.
Percent Volatile:	Not available.
Molecular Weight:	192.13 (Citric Acid, Anhydrous)
Chemical Formula:	C6H807 (Citric Acid, Anhydrous)

Section 10 - Chemical Stability & Reactivity Information

Chemical Stability
Stable under normal conditions. Dilute aqueous solutions of Citric Acid may ferment if left standing for long period of time.

Chemical Stability: Conditions to Avoid
Heat, moisture and incompatible materials.

Incompatibility
Potentially explosive reaction with metal nitrates, strong bases, and oxidizers. Citric Acid is incompatible with reducing agents.
Citric Acid Solution is corrosive to brass, copper, zinc, aluminum and their alloys, lead, cast iron and steel (not stainless steel).

Hazardous Decomposition
Residue: Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

Hazardous Polymerization
Hazardous polymerization will not occur.

Section 11 - Toxicological Information

Acute and Chronic Toxicity

A: General Product Information
Citric Acid has been reported to have allergenic properties, and might cause allergic contact dermatitis and sensitization to the sun. Irritation of the skin, eyes, and gastrointestinal tract may occur, but should not require extensive therapy beyond dilution/irrigation. Vapors and solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations. This product may cause moderate irritation of the skin. Citric Acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Dusts and mists from solutions may cause mild to moderate irritation to the nose and throat. Higher concentrations could cause coughing, sneezing, and labored breathing.
Chronic, high concentration overexposure to Citric Acid can result in a reduction of plasma calcium concentration, which can lead to cardiac arrhythmias, reduced cardiac output and, in severe cases, death.

B: Component Analysis - LD50/LCso
Citric Acid (77-92-9)
LD50 (Oral-Rat) 3 gm/kg; LD50 (Oral-Mouse) 5040 mg/kg: Lungs, Thorax, or Respiration changes; Musculoskeletal changes; LD50 (Subcutaneous-Rat) 5500 mg/kg; LD50 (Subcutaneous-Mouse) 2700 mg/kg: Lungs, Thorax, or Respiration changes; Musculoskeletal changes; LD50 (Intraperitoneal-Rat) 290 mg/kg; LD50 (Intraperitoneal-Mouse) 903 mg/kg; LD50 (Intravenous-Mouse) 42 mg/kg: Behavioral: convulsions or effect on seizure threshold; Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: changes in structure or function of salivary glands; LD50 (Intravenous-Rabbit) 330 mg/kg

B: Component Analysis - TDLo/TCLo/LD/LDLo
Citric Acid (77-92-9)
LDLo (Oral-Rabbit) 7 gm/kg: Behavioral: tremor, convulsions or effect on seizure threshold, muscle contraction or spasticity

Carcinogenicity
A: General Product Information
No information identified.

B: Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology
No information available.

Neurotoxicity
Has not been identified.

Mutagenicity
Citric Acid would not be expected to be genotoxic at physiological concentrations because it is a normal metabolite. It was not mutagenic in Salmonella typhimurium, and did not induce chromosome aberrations in cultured Chinese hamster fibroblast cells.

Teratogenicity
Citric Acid did not cause reproductive effects when tested in experimental animals. The sodium salt did not cause birth defects in rats. When given to rats at 1.2% in the diet over 2 generations, it did not affect reproduction. It did not affect litter size or survival of mice with prenatal exposure to up to 5% in the diet.

Other Toxicological Information
Persons with pre-existing eye, skin, respiratory, or allergic conditions may be more sensitive.

Section 12 - Ecological Information

Ecotoxicity
A: General Product Information
Water Solubility = 59.2% (20 deg C); 84% (100 deg C). Biological Oxygen Demand (BOD): 40%, 5 days; 60%, 10-20 days. Citric Acid biodegrades quite rapidly. It is dangerous to aquatic life in high concentrations. Lowers pH in water but does not dissociate to any great extent.
Food Chain Concentration Potential: Very Low

B: Ecotoxicity
TLm (immersion-shore crab) 48 hours = 160 ppm (salt water); TLm (immersion-goldfish) 4 hr = 894 ppm (fresh water/ killed); ECo (Pseudomonas putida bacteria) 16 hours = >10,000 mg/L; EC0 (Microcystis aeruginosa algae) 8 days = 80 mg/L; ECo (Scenedesmus quadricauda green algae) 7 days = 640 mg/L; ECo(Entosiphon sulcatum protozoa) 72 hours = 485 mg/L; ECo (Uronema parduczi Chatton-Lwoff protozoa) = 622 mg/L; LD0 (Daphnia magna) = 80 mg/L, long-time exposure in soft water; LD0 (goldfish) = 625 mg/L, long-time exposure in hard water; LD100 (goldfish) = 894 mg/L, long-time exposure in hard water; LD100 (Daphnia magna) 120 mg/L long-time exposure in soft water; toxic (Daphnia) = 100 mg/L; period of survival at pH 4.0 (goldfish) 48 hours = 894 mg/L; period of survival at pH 4.5 (goldfish) 48 hours = 625 mg/L

Environmental Fate
Citric Acid is a naturally occurring chemical and is biodegradable.
Octanol/Water Partition Coefficient Log P (oct): -1.72.

Section 13 - Disposal Considerations

US EPA Waste Number & Descriptions
A: General Product Information
Concentrated solutions may be considered D002 wastes (corrosive) by RCRA. Wastes should be tested prior to disposal to determine classification.

B: Component Waste Numbers
No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions
Review federal, provincial, and local government requirements prior to disposal.

Section 14 - Transportation Information

US DOT Information
Shipping Name: Not Regulated

Section 15 - Regulatory Information

US Federal Regulations
A: General Product Information
No additional information.

B: Component Analysis
None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Citric Acid. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire	Reactivity	Pressure	Immediate Health	Chronic Health

		Hazard	Hazard	Hazard	Hazard	Hazard
Citric Acid	77-92-9	No	No	No	Yes	Yes

State Regulations
A: General Product Information
Other state regulations may apply.

B: Component Analysis - State Citric Acid and Water are listed as follows: NJ4: New Jersey other (included in 5 predominant ingredients >1%); PA3: Pennsylvania (non-hazardous - present at 3% or greater)

Component	CAS #	CA	FL	MA	MN	NJ	PA
Citric Acid	77-92-9	No	No	No	No	Yes	Yes

Other Regulations
A: General Product Information No additional information.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Citric Acid	77-92-9	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Citric Acid	77-92-9	1% item 409 (80)

ANSI Labeling (Z129.1):
DANGER! CORROSIVE. CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION OR BURNS. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing aerosols or mists. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep from contact with clothing. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use water fog, dry chemical, CO2, or "alcohol" foam. IN CASE OF SPILL: Neutralize spill and wash area. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

For Additional Information:
Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

NOTICE
Univar USA expressly disclaims all express or implied warranties of merchantibility and fitness for a particular purpose with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar USA Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar USA makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar USA's control. Therefore, users are responsible to verify this data under their own operating

conditions to determine whether the product is suitable for their particular purposes, and they assume all risks of their use, handling, and disposal of the product or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein and does not relate to its use in combination with any other material or in any other process.

END OF MSDS

MATERIAL SAFTEY DATA SHEET

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SECTION 1 - IDENTIFICATION DATA

==========

Innovation Fuels
126 Passaic St.
Newark NJ 07104

EMERGENCY TELEPHONE NUMBER:
8:00 AM - 5:00 PM EST
(973) 482-2400

EB-Gly.1.1

EFFECTIVE DATE: 10/01/07

Common Name: Crude Glycerin
Chemical Name: Propantriol, 1,2,3-Propantriol
Formula: HO-CH2-CH(OH)-CH2-OH
Molecular Weight: 92.09 g/Mol
Chemical Family: CAS No: 56-81-5

MSDS REVIEWED BY Tom Grossberger, Technical Director

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SECTION 2 – INGREDIENTS AND HAZARDOUS CLASSIFICATION

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Hazardous Components	Percent	CAS No.	OSHA PEL	ACGIH PEL
Glycerin	65-85%	56-81-5	15 mg/m3 (mist)	10 mg/m3 (mist)
Methanol	12-31%	67-56-1	TWA 200ppm	TWA 200ppm
Sodium Methylate	4 – 8%	124-1-4	Not Established	Not Established

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SECTION 3 - CHARACTERISTICS

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Solubility in Water: Miscible
Appearance and Odor: Clear, “Tea” Colored Liquid

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SECTION 4 - FIRE AND EXPLOSION DATA

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Flammability of the Product: Flammable.
Auto-Ignition Temperature: The lowest known value is 463.89°C (867°F) (Methyl alcohol).
Flash Points: The lowest known value is CLOSED CUP: 12°C (53.6°F). (Methyl alcohol)
Flammable Limits: The greatest known range is LOWER: 6% UPPER: 36.5% (Methyl alcohol)

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, of combustible materials.
Flammable in presence of moisture.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

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

Special Remarks on Fire Hazards:
Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition, it emits acrid smoke and irritating fumes.

CAUTION -
MAY BURN WITH NEAR INVISIBLE FLAME (Methyl alcohol)
Special Remarks on Explosion Hazards: Not available.

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SECTION 5 – ACCIDENTAL RELEASE MEASURES

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

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

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SECTION 6 – HANDLING AND STORAGE

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Precautions:
Keep under inert atmosphere. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested,
seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep

away from incompatibles such as oxidizing agents, moisture.

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

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SECTION 7 – EXPOSURE CONTROLS/PERSONAL PROTECTION

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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:
Methyl alcohol
TWA: 200 STEL: 250 (ppm) from ACGIH (TLV) [1995]
TWA: 262 STEL: 328 (mg/m3) from ACGIH [1995]
Consult local authorities for acceptable exposure limits.

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SECTION 8 - HEALTH HAZARD DATA

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ROUTES OF EXPOSURE

INHALATION: Inhaling mist or spray is irritating to the upper respiratory tract and depending on the severity of exposure, may cause tissue damage. Wear protective gear when not using with adequate ventilation.

SKIN CONTACT: This product is irritating to tissues contacted and may cause skin damage.

SKIN ABSORPTION: See SKIN CONTACT above.

EYE CONTACT: This product is irritating to eye tissues on contact. May cause permanent eye damage. Seek

professional medical attention.

INGESTION: This product, if swallowed, will be irritating to the mouth, throat, and stomach.

EFFECTS OF OVEREXPOSURE

ACUTE: Irritating to all body tissues with which it comes in contact.

CHRONIC: Repeated or prolonged exposure may cause dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

EYES: IMMEDIATELY flush eyes with large amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Washing eyes within 1 minute is essential to achieve maximum effectiveness. Seek medical attention immediately.

SKIN: Immediately wash contaminated areas with plenty of water for 15 minutes. Remove contaminated clothing and foot wear, and wash clothing before reuse. Discard any clothing that cannot be decontaminated. Seek medical attention immediately.

INHALATION: Get person out of contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.

INGESTION: NEVER give anything by mouth to an unconscious person. If swallowed, do not induce vomiting. Give large quantities of water. If vomiting occurs spontaneously, keep airway clear. Seek medical attention immediately.

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SECTION 9 - SPECIAL HANDLING PROCEDURES

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RESPIRATORY: Respiration protection is not required under normal use. Use NIOSH/MSHA approved respirator where mist or spray may be generated above TLV limit.

VENTILATION: Use adequate local exhaust ventilation where mist or spray may be generated, to maintain level below the TLV limit.

GLOVES: Impervious gloves should be worn (ex. rubber or neoprene).

EYES: Chemical safety goggles and/or face shield.

OTHER: Chemically resistant shoes and apron. Safety showers and eyewash facilities should be accessible. All contaminated clothing should be washed with soap and water, and dried before reuse.

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SECTION 10 - SPECIAL PRECAUTIONS

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HANDLING AND STORAGE PRECAUTIONS:

Avoid contact with skin and eyes. Wash thoroughly after handling material Store in a cool, dry area, in a closed container when not being used. DO NOT STORE with strong acids and oxidizers.

OTHER PRECAUTIONS:

Keep container tightly closed when not in use. Wash thoroughly after handling containers, even those that have been emptied, will retain product residue and vapors. Always obey hazard warnings and handle empty containers as if they were full. Containers must not be used for any other purpose.

The information herein is based on technical data that is believed to be reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside our control, we make no warranties, expressed or implied, and assume no liability in connection with the use of this information.

REVOLUTIONARY. RELIABLE. RESPONSIBLE.

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION

Envirotemp® FR3® fluid

Envirotemp FR3 fluid is a dielectric fluid intended for use as an insulation and cooling medium in electrical apparatus such as electrical distribution and power transformers.

Cooper Power Systems
1900 East North Street
Waukesha, Wisconsin 53188-3899 USA
Telephone: +01 262 524 3300
Internet: www.cooperpower.com
Emergency telephone (Chemtrec): +01 800 262 8200

2. COMPOSITION/INFORMATION ON INGREDIENTS

Envirotemp FR3 fluid is a proprietary formulation using food-grade vegetable oils combined with performance-enhancing additives. All components are listed in the EINECS inventory.

Component	Proportion (wt%)
Vegetable oil	> 98.5
Antioxidant additive	< 1.0
Cold flow additive	< 1.0
Colorant	< 1.0

3. HAZARDS IDENTIFICATION

Envirotemp FR3 fluid is a preparation not classified as dangerous according to Directive 1999/45/EC. Not expected to cause a severe emergency hazard.

Routes of entry

Eyes: Contact may occur as a result of splash or exposure to mist conditions. May cause irritation and redness.

Skin: Typically non-irritating. In some case, a sensitization to vegetable oils may cause localized redness

Ingestion: May cause gastric irritation.

Inhalation: Exposure may occur as a result of mist exposure. May cause respiratory irritation.

Signs and symptoms of exposure: none known

Medical conditions generally aggravated by exposure: There is a very small risk for an allergic reaction to soybean oil in persons allergic to soybeans themselves.

4. FIRST AID MEASURES

Inhalation: If inhaled, remove affected person from exposure to mists.

Eye contact: For eye contact, flush the eyes immediately with large amounts of water with the eyelids held away from the eye to ensure thorough rinsing.

Skin contact: For skin contact, remove by washing with soap and water. Get medical attention if irritation persists.

Ingestion: If swallowed, observe for signs of stomach discomfort or nausea. If symptoms persist, seek medical help. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

Extinguishing media: CO_2 or dry chemical foam

Special fire fighting procedures: Use approved self-contained breathing apparatus with full facemask and full protective equipment in confined areas. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from source of ignition. Application of water to flaming oil can cause spreading.

Unusual fire and explosion hazards: Slight when exposed to flame. Can react with oxidizing materials. Clay materials (Fuller's earth, oil dry products) saturated with Envirotemp FR3 fluid can, under certain conditions, undergo a slow oxidation that releases heat. If the heat so released cannot escape, it is possible that the temperature may increase and ignite combustible materials in close contact.

6. ACCIDENTAL RELEASE MEASURES

Steps to take in case material is released or spilled: Contain and control the leaks or spills with non-combustible absorbent materials such as sand, earth, vermiculite, or diatomaceous earth in drums for waste disposal. Prevent any material from entering drains or waterways. If the product contaminates waterways, rivers or drains, alert the relevant authorities in accordance with statutory procedures.

In the USA, spills into navigable waters must be reported to the National Response Center, 800-424-8802

7. HANDLING AND STORAGE

Precautions to take in handling and storage: Avoid extremes of temperature in storage. Store Envirotemp FR3 fluid in labeled, tightly closed containers in cool, dry, isolated and well-ventilated areas, away from sources of ignition or heat. To maintain fluid for intended use as an electrical insulating fluid, eliminate exposure to oxygen and moisture.

Intermediate bulk storage container (tote): Prolonged exposure to ultraviolet radiation (sunlight) may affect color.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:

	TWA (mg/m^3)	
	OSHA[1] PEL	ACGIH[2] TLV
Vegetable oil mists	--	10
Vegetable oil mists: total dust	15	--
Vegetable oil mists: respirable fraction	5	--

Hazardous Materials Identification System (HMIS):	**Health**	**Flammability**	**Physical Hazard**
	0	1	0

Respiratory protection: Use approved supplied-air respiratory protection if occupational exposure limits are exceeded.

Ventilation: General mechanical ventilation can be used to control or reduce airborne concentrations of oil.

Protective gloves: Oil- and heat-resistant gloves are recommended when fluid temperature is above ambient conditions.

Eye protection: Wear safety glasses or goggles to prevent eye contact. Eye baths should be readily available in the area of handling Envirotemp FR3 fluid.

Other protective clothing or equipment: Wear regularly laundered coveralls or lab coat to minimize skin exposure.

Workplace hygienic practices: Wash with soap and water after contact. Avoid exposure to mists.

Environmental exposure controls: Have oil-absorbent materials easily available.

[1] U.S. Occupational Health and Safety Administration

[2] American Conference of Governmental Industrial Hygienists

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and odor: clear light-green liquid with slight vegetable oil odor **pH:** neutral

Closed cup flash point: 310 – 320°C

Boiling point: >360°C

Vapor pressure (mm Hg): < 0.01 @ 20°C

Vapor density (air = 1): n/a

Solubility in water: negligible; < 0.1%

Viscosity: 33-35 mm^2/s at 40°C

Autoignition temperature: 401 – 404°C

Relative density (H_2O = 1): 0.92

Pour point: -18 to -24°C

Evaporation rate (butyl acetate = 1): nil

Volatile organic compounds: < 0.001 g/L

Miscibility: mixes with other dielectric fluids except silicone

10. STABILITY AND REACTIVITY

Stability: Envirotemp FR3 fluid is stable under normal conditions of use.

Incompatibility (materials to avoid): Avoid contact with strong oxidizing agents.

Hazardous decomposition products: none

Hazardous Polymerization: will not occur

Stabilizers: not required

Hazardous exothermic reaction: Slight when exposed to flame; can react with oxidizing materials. Class III B liquid. Clay materials (Fuller's earth, oil dry products) saturated with Envirotemp FR3 fluid can, under certain conditions, undergo a slow oxidation that releases heat. If the heat so released cannot escape, it is possible that the temperature may increase and ignite combustible materials in close contact.

11. TOXICOLOGICAL INFORMATION

Carcinogenicity: none **NTP:** no **IARC monographs:** no **OSHA regulated:** no

Envirotemp FR3 fluid base oil is "generally recognized as safe" (GRAS) by the U.S. Food and Drug Administration and allowed for human consumption as a food and as a component that is allowed in contact with human food.

12. ECOLOGICAL INFORMATION

Acute oral toxicity (OECD 420 - rats): LD_{50} >2000 mg/kg

Acute aquatic toxicity (OECD 203 - trout): LC_{50} >1000 mg/kg; NOAEC >1000 mg/kg

Aquatic biodegradation (OPPTS 835.3110): readily biodegradable, >99%

Biological oxidation demand (5-Day SM5210B): 250 ppm

Chemical oxygen demand (SM5220D): 560 ppm **BOD/COD ratio:** 45%

Petroleum hydrocarbon content: none

Environmental physical hazard: Envirotemp FR3 fluid shares physical hazards common to all oils such as coating feathers, fur and gills.

13. DISPOSAL CONSIDERATIONS

Recycling: Consult with local used oil recyclers, restaurant grease recyclers, fat rendering companies, or biodiesel producers.

Hazardous Waste: Envirotemp FR3 fluid itself, when discarded or disposed of, is not a hazardous waste. Envirotemp FR3 fluid from retrofilled electrical equipment may contain residues of earlier fluid(s) in such quantity as to qualify as a hazardous waste.

Disposal: Incinerate or landfill in accordance with local regulations. Do not pour into drains or waterways.

14. TRANSPORT INFORMATION

Harmonized System Tariff Classification (Schedule B): 1507.90.4050

National Motor Freight Classification (NMFC): 155250

Euro Tariff: 15 07 10 10 00

15. REGULATORY INFORMATION

Envirotemp FR3 fluid itself, when discarded or disposed of, is not listed as a hazardous waste per 40 CFR 261 and is not a used oil per 40 CFR 279. Envirotemp FR3 fluid is a preparation not classified as dangerous according to Directive 1999/45/EC.

16. OTHER INFORMATION

Technical information available at the Cooper Power Systems website: www.cooperpower.com

This Material Safety Data Sheet has been prepared in order to help the users of Envirotemp FR3 fluid. The data contained herein is accurate as of the date of preparation of this sheet.

Effective Date: May 2, 2007

John Luksich
Senior Engineer – Dielectric Fluids

MATERIAL SAFETY DATA SHEET

Stock product

Matreya LLC

Date-Issued: 10/12/2004
MSDS Ref. No: 1118
Date-Revised: 07/27/2007
Revision No: 1

Esterified steryl glucosides

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Esterified steryl glucosides
PRODUCT DESCRIPTION: Esterified steryl glucosides
PRODUCT CODE: 1118

MANUFACTURER

Matreya
168 Tressler Street
Pleasant Gap, PA 16823
Ph # 814-359-5060

24 HR. EMERGENCY TELEPHONE NUMBERS

800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	Wt.%	CAS#	EINECS#
Esterified steryl glucosides, (1:1:1, sterol: glucose: fatty acid)	100		

COMMENTS: Source: natural, (plant)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: White solid

IMMEDIATE CONCERNS: R36/37/38 - Irritating to eyes, respiratory system and skin.

POTENTIAL HEALTH EFFECTS

EYES: Contact may cause eye irritation.

SKIN: May cause skin irritation.

INGESTION: Substance may be harmful if swallowed.

INHALATION: Low hazard for usual industrial or commercial handling.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

EYES: Causes eye irritation.

SKIN: Contact causes skin irritation.

INHALATION: Prolonged or excessive inhalation may cause respiratory tract irritation.

ACUTE TOXICITY: Slightly irritating to eyes and respiratory tracts.

CARCINOGENICITY: This material not known to cause cancer in animals or humans.

COMMENTS HEALTH: The toxicological properties of this material have not been fully investigated.

4. FIRST AID MEASURES

EYES: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes.

SKIN: Wash with soap and water.

INGESTION: Get medical attention immediately.

INHALATION: No specific treatment is necessary since this material is not likely to be hazardous by inhalation. If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water in order to prevent pressure build-up, autoignition or explosion.

FIRE FIGHTING PROCEDURES: As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Clean up spills immediately, observing precautions in Protective Equipment section.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Avoid contact with eyes, skin, and clothing.

HANDLING: Avoid breathing (dust, vapor, mist, gas).

STORAGE: Store at -20C

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Use only in a well ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear safety glasses with side shields (or goggles) and a face shield.

SKIN: Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: solid
MOLECULAR WEIGHT: 814
MOLE. WT. FORMULA: $C_{51}H_{90}O_7$

10. STABILITY AND REACTIVITY

STABLE: YES

STABILITY: Stable.

POLYMERIZATION: Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS: Not Available

INCOMPATIBLE MATERIALS: Strong oxidizers.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Not available

SKIN EFFECTS: Not available

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: Do not flush to sewer.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: This material and its container must be disposed of in a safe way.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
PROPER SHIPPING NAME: Not restricted
TECHNICAL NAME: Nonhazardous
PRIMARY HAZARD CLASS/DIVISION: Not Regulated

15. REGULATORY INFORMATION

UNITED STATES
SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
311/312 HAZARD CATEGORIES:
FIRE: NO **PRESSURE GENERATING:** NO **REACTIVITY:** NO **ACUTE:** NO **CHRONIC:** NO

16. OTHER INFORMATION

REVISION SUMMARY Revision #: 1 This MSDS replaces the October 15, 2004 MSDS. Any changes in information are as follows: In Section 1 Product Code

MANUFACTURER SUPPLEMENTAL NOTES: **Not for drug or diagnostic use.**

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MATERIAL SAFETY DATA SHEET **MSDS No. 0915215**

GARRATT-CALLAHAN COMPANY
111 ROLLINS ROAD
MILLBRAE CA, 94030

REVISED:1/29/97
PRINTED: 12/23/97

FORMULA 307

FOR A CHEMICAL EMGERGENCY SPILL, LEAK, FIRE, OR ACCIDENT CALL CHEMTREC (800) 424-9300 24 HRS

FOR MEDICAL EMERGENCY CALL (650) 697-5811, 8 AM-4:30 PM PST or CALL (303) 623-5716 (ROCKY MTN POISON CENTER) 24 HOUR NUMBER

FOR NON-EMERGENCY PRODUCT INFORMATION CALL (650) 697-5811 BETWEEN 8 AM AND 4 PM PACIFIC TIME

SECTION #1 - IDENTIFICATION (LA IDENTIFICACION)

PRODUCT NAME: FORMULA 307
PRODUCT USE: Control of bacteria, fungi, and algae in industrial cooling water systems.

HAZARD RATING
HEALTH: 1
FLAMMABILITY : 0
REACTIVITY: 1
SPECIAL : OXIDIZER

EPA Reg. No. 148-628-8540

SECTION #2 - HAZARDOUS COMPONENTS (LOS COMPONETES PELIGROSOS)

COMPONENT	CAS#	%	EXPOSURE LIMIT
Sodium hypochlorite	7681-52-9	10.0	OSHA PEL: 1 ppm (as chlorine) ACGIH TLV: 0.5 ppm or 1.5 mg/m^3 (as chlorine) OSHA STEL/C: 3mg/m^3 (as chlorine) ACGIH STEL: 1 ppm (as chlorine)
Sodium Hydroxide	1310-73-2	0-10.0	ACGIH TLV CEILING: 2mg/m^3

NOTE: OSHA requires only that hazardous components be listed in this section.

SECTION #3 - PHYSICAL DATA (LA INFORMACION FISICA)

APPEARANCE: Clear Liquid

BOILING POINT: 100 ° C

VAPOR DENSITY: No Data

VAPOR PRESSURE: 17.5 mm Hg

pH: >13.0 neat

COLOR: Water white to light yellow

% VOLATILES BY VOL: approx 90

SOLUBILITY IN WATER: Complete

SPECIFIC GRAVITY: 1.1 - 1.2

EVAPORATION RATE: <1 where butyl acetate=1

ODOR: chlorine

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MILLBRAE CA, 94030

SECTION #4 - FIRE AND EXPLOSION DATA (LA INFORMACION DE FUEGO Y EXPLOSION)

FLASHPOINT (PMCC):NONE LEL: UNKNOWN
AUTOIGNITION: NONE UEL: UNKNOWN

FIRE POTENTIAL (EXTINGUISHING MEDIA): Use water spray, dry chemical, CO2 or foam.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Wear self contained breathing apparatus and full protective gear.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing material - can supply oxygen and stimulate combustion.

SECTION #5 - EXPOSURE & EFFECT (LA EXPOSICION Y EFECTOS)

ROUTES AND EFFECTS OF EXPOSURE:

SKIN CONTACT: May irritate or burn skin.

EYE CONTACT: Will severely burn or injure eyes, may cause blindness.

INGESTION: Will burn or cause serious damage to mouth, throat and stomach.

INHALATION: Inhalation may cause sever irritation, sneezing. Prolonged or repeated overexposure may cause pneumonia, or damage to the respiratory system.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Remove contaminated clothing and flood skin with water for at least 15 minutes. Then wash gently with soap and water. Do not put on clothing again until all chemicals have been thoroughly washed out of them. Shoes and gloves soaked with chemicals should be discarded. Call a physician if pain, irritation, or other symptoms persist.

EYES: Flood the eye immediately with copious amounts of water. Do this for 15 minutes. Have the patient blink as much as possible while flooding the eye. Do not force eyelid open. Call a Physician immediately.

INGESTION: If conscious, give large quantities of water. Get medical attention immediately.

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INHALATION: Immediately get the person to fresh air. Avoid breathing mists. Open doors and windows wide. If patient is not breathing, start artificial respiration and call a physician. If breathing is difficu.lt, give oxygen (6-12 L/min). Get medical attention

SECTION #6 - REACTIVITY & POLYMERIZATION (LA REACTIVIDAD Y POLIMERIZACION)

STABILITY: Stable CONDITIONS TO AVOID (STABILITY): Do not store in direct sunlight. Keep away from heat

INCOMPATIBLE MATERIALS: May react vigorously with organics and strong reducing agents such as sulfites and nitrites.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic Chlorine fumes when heated to decomposition.

CONDITIONS TO AVOID (POLYMERIZATION): None HAZARDOUS POLYMERIZATION: Will not occur

MATERIAL SAFETY DATA SHEET **MSDS No. 0915215**

GARRATT-CALLAHAN COMPANY
111 ROLLINS ROAD
MILLBRAE CA, 94030

SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES (LA ATILLA, GOTERA, & LOS PROCEDIMIENTOS DE ELIMINACION)

Accidental Release Procedure: Remove all sources of ignition. Evacuate all nonessential personnel. Hazardous concentrations may be found in the local spill area and immediatly downwind. Wear protective clothing (see section 8). Contain with absorbent material (sand, clay or other non-combustable material) and place into containers for later disposal.

Waste disposal method:
Solids must be disposed of in a permitted hazardous waste manaement facility . Dispose of material in accordance with all Federal, Satate and Local regulations.

SECTION #8 - SPECIAL PROTECTIVE MEASURES (LAS MEDIDAS PROTECTORAS ESPECIALES)

VENTILATION: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the room.

SKIN PROTECTION: Neoprene gloves, elbow length. .

EYE PROTECTION: Chemical worker's goggles or face mask.

OTHER: Rubber boots and apron plastic coveralls to prevent skin contact.

RESPIRATORY PROTECTION: None needed under normal use conditions. If exposure limits are exceeded, use a NIOSH/MSHA respiratior approved for your conditions of exposure. Seek Professional advice on respiratory programs.

WORK/HYGIENIC PRACTICES:
Have eyewash and safety shower, ANSI Z358.1-1990 certified, in work area. Remove contaminated clothing. Wash contaminated clothing before reuse. If liquid is adsorbed into shoes or gloves, discard.

SECTION #9 - STORAGE & HANDLING INFORMATION (INFORMACION DE ALACENAMIENTO Y MANIPULACION)

STORAGE AND HANDLING CONDITIONS:
Keep container closed when not in use. Store in a cool, dry place, out of direct sunlight and away from heat. Decomposition can cause pressure to build up in closed containers; relieve internal presure when received and at least weekly thereafter by slowly loosening bung. Re-tighten immediately. Wear protective equipment.

SECTION #10 - TRANSPORTATION INFORMATION (INFORMACION DE TRANSPORTACION)

DOT SHIPPING NAME: Hypochlorite solution

DOT HAZARD CLASS: 8, PGIII

UN/NA#: UN1791

DOT LABEL REQUIRED: Corrosive

DOT REPORTABLE QUANTITY: 100 Lbs.(45.4 Kg.)

MATERIAL SAFETY DATA SHEET **MSDS No. 0915215**

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MILLBRAE CA, 94030

SECTION #11 - REGULATORY INFORMATION (INFORMACION REGULADOR)

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade secrets are indicated by "TS".

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III requires emergency planning based upon Threshold Planning Quantities (TPQ's) and release reporting based on Reportable Quantities (RQ's) in 40 CFR 355 (used for SARA 302, 304, 311, AND 312).

Components present in this product at the level which would require reporting under the statute are:

Substance	CAS No.	Percent
Sodium Hydroxide	1310-73-2	0-10

TPQ: 10,000 LBS RQ: 1000 LBS

SARA 311/312: Sara Hazard Class:
Acute Health Hazard.
Reactivity Hazard

THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (CERCLA) requires notification of the National Response Center of release of quantities of hazardous substances equal to or greater than the reportable quantities (RQ's) in 40 CFR 302.4.

Components present in this product at the level which would require reporting under the statute are:

Substance	CAS No.	Percent
Sodium Hydroxide RQ: 1000 LBS	1310-73-2	5-10
Sodium Hypochlorite RQ: 100 LBS	7681-52-9	10.0

Clean Water Act: Reportable quantity (RQ) Sodium Hypochlorite : 100 lb(45.4kg).

RCRA: May be a RCRA waste no. 0002

Garratt CALLAHAN

MATERIAL SAFETY DATA SHEET

Garratt-Callahan Company
50 Ingold Road
Burlingame, California 94010-2206

24 - HOUR EMERGENCY PHONE NUMBER: 303-623-5716

CHEMTREC: 1-800-424-9300

Customer Service, Product Information: 650-697-5811

Effective Date: 04/15/2005 Date Printed: 08/12/2008 MSDS Number: 3315

SECTION #1 - IDENTIFICATION

Product Name: **FORMULA 315** Product Number: 0918615

Product Use: Cooling water micro-biocide EPA Reg. Number: 8540-23

Chemical Family: Non-oxidizing biocide

SECTION #2 - HAZARDOUS COMPONENTS*

			EXPOSURE LIMITS		
COMPONENT	CAS NUMBER	PERCENT	ACGIH TLV	OSHA PEL	OTHER
5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	1.11-1.15%	None established	None established	TWA: 0.076 mg/m3 STEL: 0.23 mg/m3
2-methyl-4-isothiazolin-3-one	2682-20-4	0.35-0.39%	None established	None established	TWA: 1.5 mg/m3 STEL: 4.5 mg/m3
copper nitrate	10031-43-3	0.23%	1 mg/m3 (Cu, as dust & mists)	None established	Not applicable

*NOTE: OSHA requires only that hazardous components be listed in this section.

SECTION #3 - PHYSICAL DATA

APPEARANCE:	Clear yellow green liquid	% VOLATILES BY VOL:	95 (water)
BOILING POINT:	100 C	SOLUBILITY IN WATER:	Complete
VAPOR DENSITY:	0.62 where air=1	SPECIFIC GRAVITY:	0.95-1.10
VAPOR PRESSURE:	17 mm Hg	EVAPORATION RATE (*where butyl acetate = 1*):	<1
pH:	3.0-6.5	ODOR:	Pungent

SECTION #4 - FIRE AND EXPLOSION DATA

FLASHPOINT (PMCC): Non-flammable

AUTOIGNITION: Not applicable EXPLOSIVE LIMITS: LEL: Not applicable UEL: Not applicable

EXTINGUISHING MEDIA: Use media appropriate for the surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

FIRE FIGHTING INSTRUCTIONS: No special instructions.

SECTION #5 - EXPOSURE & EFFECT

SKIN CONTACT: Corrosive. Acute - May irritate or burn skin. Chronic - Skin sensitizer. May cause allergic contact dermatitis.

EYE CONTACT: Corrosive. Will severely burn or injure eyes. May cause blindness.

INGESTION: May irritate or burn mouth, throat, and stomach. May cause serious damage to mouth, throat, and stomach.

INHALATION: Fumes may irritate eyes, throat, lungs.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN CONTACT: Remove contaminated clothing and flood skin with water for at least 15 minutes. Then wash gently with soap and water. Do not put on clothing again until all chemicals have been thoroughly washed out of it. Shoes and gloves, any leather articles soaked with chemical must be discarded. Get prompt medical attention.

EYE CONTACT: Flood the eye immediately with large amounts of water. Do this for 15 minutes. Have the patient blink as much as possible while flooding the eye. Do not force eyelid open. Call a physician.

INGESTION: Unless patient is unconscious, having convulsions, or cannot swallow, give 2 glasses of water immediately. Seek medical attention.

INHALATION: Remove patient to fresh air. If dizziness, nausea, irritation, difficulty breathing, or other symptoms persist, seek medical attention.

NOTES TO PHYSICIAN: Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.

SECTION #6 - REACTIVITY & POLYMERIZATION

STABILITY: Stable

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIALS: Oxidizing agents, reducing agents, amines, mercaptans.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may yield the following: hydrogen chloride, oxides of sulfur and nitrogen.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES

SPILL/LEAK: Wear protective clothing. Contain with inert absorbent material and transfer contaminated materials to suitable containers for disposal. Deactivate spill area with freshly prepared solution of 5% sodium bicarbonate and 5% sodium hypochlorite in water. Apply solution to spill to deactivate any residual active ingredient. Let stand for 30 minutes. Flush area with large amount of water to sanitary sewer (if in accordance with local procedures, permits and regulations). Do not add deactivation solution to waste drum to deactivate the adsorbed material.

DISPOSAL: Dispose of in waste management facility or in compliance with federal, state and local regulations. Liquid and contaminated solids can be incinerated in accordance with local, state, and federal regulations.

SECTION #8 - SPECIAL PROTECTIVE MEASURES

VENTILATION: Use local exhaust ventilation with a minimum capture velocity of 150 ft/min (0.75 m/sec.) at the point of mist evolution.

RESPIRATORY PROTECTION: Typical use of this material does not result in workplace exposures that exceed the exposure limits listed. For those special workplace conditions where exposure limits are exceeded, a respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements must be followed.

SKIN PROTECTION: Note: Material is a potential skin sensitizer. Use butyl rubber, or nitrile gloves, elbow length. Rinse and remove gloves immediately after use. Wash hands with soap and water.

EYE PROTECTION: Use chemical splash goggles and face shield.

OTHER: Use chemically resistant apron or other impervious clothing to prevent skin contact.

WORK/HYGIENIC PRACTICES: Have eyewash station in work area. Remove contaminated clothing. Wash contaminated clothing before reuse. If liquid is adsorbed into shoes or gloves, discard.

SECTION #9 - STORAGE & HANDLING INFORMATION

HANDLING: This material is corrosive. See Section 8, Special Protective Measures, prior to handling.

STORAGE: Keep container covered and sealed when not in use. Do not add water or any other material to drum of product or otherwise contaminate it. Store in a cool, dry place. The maximum storage temperature is 40 C/104 F. Do not store this material in containers made of steel.

SECTION #10 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Corrosive Liquid, Acidic, Organic, N.O.S, (5-chloro-2-methyl-4-isothiazolin-3-one

DOT HAZARD CLASS: 8 PGII

UN/NA#: UN3265

DOT LABEL REQUIRED: Corrosive

SECTION #11 - REGULATORY INFORMATION

The following regulations are known to apply to the use and disposal of this product. Additional Federal, State and Local regulations may also be applicable.

SARA TITLE III Section 311/312 Hazard Category: Acute Health Hazard

SARA TITLE III Section 313 Toxic Chemicals List (40CFR372)

This product contains a chemical which is listed in Section 313 at or above minimum concentrations. The following listed chemicals are present:

None

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (40CFR302.4)

This material is regulated under CERCLA and SARA Title III Section 304. This material is or contains chemical(s) listed in 40CFR Table 302.4. The Reportable Quantity(s) (RQ) are listed below.

None

California Proposition 65- The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer or reproductive toxicity.

No components of the product are listed.

Toxic Substances Control Act (TSCA) Inventory Status:

All components are listed on the TSCA Inventory.

HMIS Rating: HEALTH: 3 FIRE: 0 REACTIVITY: 1

NFPA Rating: HEALTH: 3 FIRE: 0 REACTIVITY: 1

SECTION #12 - TOXICOLOGICAL INFORMATION

Toxicity

Oral:	LD50/rat: 3310 mg/kg
Dermal:	LD50/rabbit: > 5000 mg/kg
Inhalation:	Acute 4 hr/ LD50/rat: 0.33 mg/L
Chronic Effects:	Carcinogenicity - Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. Sensitization - Skin sensitizer

Ecological Data

Fish:	LC50 /Rainbow trout/96 hr / 13.6 mg/L
Daphnia:	EC50 (Daphnia dubia)/48 hr / 17.7 mg/L
Algae:	No Data Available
Bioaccumulation:	Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Persistance / Degradability:	Material is biodegradable.

Garratt CALLAHAN

MATERIAL SAFETY DATA SHEET

Garratt-Callahan Company
50 Ingold Road
Burlingame, California 94010-2206

24 - HOUR EMERGENCY PHONE NUMBER: 303-623-5716

CHEMTREC: 1-800-424-9300

Customer Service, Product Information: 650-697-5811

Effective Date: 09/05/2007 Date Printed: 08/12/2008 MSDS Number: 2001

SECTION #1 - IDENTIFICATION

Product Name: **FORMULA 2001** Product Number: 0817015

Product Use: Cooling Water Corrosion and Scale Control

Chemical Family:

SECTION #2 - COMPONENTS*

			EXPOSURE LIMITS		
COMPONENT	CAS NUMBER	PERCENT	ACGIH TLV	OSHA PEL	OTHER
Potassium Hydroxide	1310-58-3	<20%	2mg/m3 ceiling	2mg/m3 ceiling	
Tetrapotassium Pyrophosphate	7320-74-5	Proprietary	None Established	None Established	
Sodium Polyacrylate	9003-04-7	Proprietary	10mg/m3	10mg/m3	
Acrylic Copolymer		Proprietary			

*NOTE: OSHA requires only that hazardous components be listed in this section.

SECTION #3 - PHYSICAL DATA

APPEARANCE:	Clear light yellow to amber liquid	% VOLATILES BY VOL:	70
BOILING POINT:	212 F	SOLUBILITY IN WATER:	Complete
VAPOR DENSITY:	Not applicable	SPECIFIC GRAVITY:	1.17-1.29
VAPOR PRESSURE:	Not applicable	EVAPORATION RATE (*where butyl acetate = 1*):	<1
pH:	13.5-14.5	ODOR:	Slight musty

SECTION #4 - FIRE AND EXPLOSION DATA

FLASHPOINT (PMCC): Non-flammable

AUTOIGNITION: Not applicable EXPLOSIVE LIMITS: LEL: Not applicable UEL: Not applicable

EXTINGUISHING MEDIA: Use media appropriate for the surrounding fire. Avoid direct contact of liquid with water.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None special hazards

FIRE FIGHTING INSTRUCTIONS: Wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face-piece operated in the pressure demand or other positive pressure mode.

SECTION #5 - EXPOSURE & EFFECT

SKIN CONTACT: Causes severe skin burns

EYE CONTACT: Will severely burn or injure eyes.

INGESTION: May irritate or burn or cause serious damage to mouth, throat, and stomach.

INHALATION: Causes respiratory tract irritation. Avoid breathing vapor.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN CONTACT: Flush with water and call a physician if pain, irritation, or other symptoms persist.

EYE CONTACT: Flood the eye with copious amounts of water. Do this for 15 minutes. Have the patient blink as much as possible while flooding the eye. Do not force eyelid open. Call a physician.

INGESTION: Unless patient is unconscious, having convulsions, or cannot swallow, give milk or water immediately. Then call a physician to find out if you should make the patient vomit.

INHALATION: If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration.

NOTES TO PHYSICIAN: Treat symptomatically

SECTION #6 - REACTIVITY & POLYMERIZATION

STABILITY: Stable

CONDITIONS TO AVOID: None known

INCOMPATIBLE MATERIALS: Strong acids, metals such as magnesium, aluminum, zinc, tin, chromium, brass, and bronze.

HAZARDOUS DECOMPOSITION PRODUCTS: Potassium oxide

HAZARDOUS POLYMERIZATION: Will not occur

SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES

SPILL/LEAK: Wear protective clothing. For larger spills, contain with absorbent material. Place is plastic bag.

DISPOSAL: Dispose of in waste management facility or in compliance with federal, state and local regulations. If spill is not contaminated you may be able to dispose of material where normally used.

SECTION #8 - SPECIAL PROTECTIVE MEASURES

VENTILATION: Normal room

RESPIRATORY PROTECTION: None needed under normal conditions of use.

SKIN PROTECTION: Plastic or rubber gloves elbow length.

EYE PROTECTION: Chemical worker's goggles or face mask.

OTHER: Plastic or rubber gloves.

WORK/HYGIENIC PRACTICES: Have eyewash and safety shower, ANSI Z358.1-1990 certified, in work area. Remove contaminated clothing. Wash contaminated clothing before reuse. If liquid is adsorbed into shoes or gloves, discard.

SECTION #9 - STORAGE & HANDLING INFORMATION

HANDLING: Keep container covered and sealed when not in use. Do not add water or any other material to drum of product or otherwise contaminate it. Wash thoroughly after handling. Read product label for further instructions.

STORAGE: Store in a cool, dry area. Separate from acids and alkalis.

SECTION #10 - TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Potassium hydroxide solution

DOT HAZARD CLASS: 8, PGII

UN/NA#: UN1814

DOT LABEL REQUIRED: Corrosive

SECTION #11 - REGULATORY INFORMATION

The following regulations are known to apply to the use and disposal of this product. Additional Federal, State and Local regulations may also be applicable.

SARA TITLE III Section 311/312 Hazard Category: Acute Health Hazard, Chronic Health Hazard

SARA TITLE III Section 313 Toxic Chemicals List (40CFR372)

This product contains a chemical which is listed in Section 313 at or above minimum concentrations. The following listed chemicals are present:

None

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (40CFR302.4)

This material is regulated under CERCLA and SARA Title III Section 304. This material is or contains chemical(s) listed in 40CFR Table 302.4. The Reportable Quantity(s) (RQ) are listed below.

Potassium hydroxide CAS#:1310-58-3 RQ:1,000 lbs

California Proposition 65- The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer or reproductive toxicity.

No components of the product are listed.

Toxic Substances Control Act (TSCA) Inventory Status:

All components are listed on the TSCA Inventory.

HMIS Rating: HEALTH: 3 FIRE: 0 REACTIVITY: 1

NFPA Rating: HEALTH: 3 FIRE: 0 REACTIVITY: 1

SECTION #12 - TOXICOLOGICAL INFORMATION

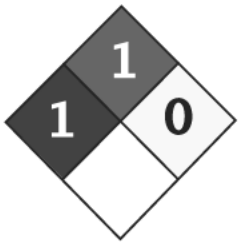
Toxicity

Oral:	No data available
Dermal:	No data available
Inhalation:	No data available
Chronic Effects:	Carcinogenicity: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Ecological Data

Fish:	LC50, Pimephales promelas, 96 Hours: 942ppm
Daphnia:	LC50, Daphnia magna, 48 Hours: 1332ppm
Algae:	No data available
Bioaccumulation:	Material is not expected to bio-accumulate.
Persistance / Degradability:	Toxic to aquatic life through an immediate raise in pH to toxic levels.

ScienceLab.com
Chemicals & Laboratory Equipment



Health	1
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lecithin MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lecithin

Catalog Codes: SLL1402, SLL1777

CAS#: 8002-43-5

RTECS: OG7565000

TSCA: TSCA 8(b) inventory: Lecithin

CI#: Not available.

Synonym: Phospholutein, Vitellin, Yelkin TTs, Alcolec S, AF 1, Acti-Flow, Azolectin, Kelecin, Granulestin; Soybean Lecithin; Soy Lecithin; Soya Lecithin; L-a-Phosphatidylcholine; Phosphatidylcholine

Chemical Name: Not available.

Chemical Formula: Not available.

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
Lecithin	8002-43-5	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. WARM water MUST be used. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

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

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Slightly explosive in presence of open flames and sparks.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: As with most organic solids, fire is possible at elevated temperatures

Special Remarks on Explosion Hazards:
Fine dust dispersed in air in sufficient concentrations, and in the presences of an ignition source is a potential dust explosion hazard.

Section 6: Accidental Release Measures

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

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 25°C (77°F). Preferably Refrigerate (2 - 6 deg. C).

Section 8: Exposure Controls/Personal Protection

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

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

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

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Granular solid.)

Odor: Neutral

Taste: Not available.

Molecular Weight: Not available.

Color:
Golden to light tan. The color is nearly white when freshly made, but rapidly becomes yellowish to brownish in iar.

pH (1% soln/water): 6.8 [Neutral.]

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: Density: 1.0305 @ 24 deg. C(Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: 1% (v/v).

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties:
Dispersed in cold water.
See solubility in diethyl ether.

Solubility:
Soluble in diethyl ether.
Insoluble in cold water, acetone. Soluble in about 12 parts of absolute alcohol.
Soluble in chloroform, petroleum ether, mineral oil, fatty acids.
Sparingly soluble in benzene.
Insoluble in cold vegetable and animal oils.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, dust generation

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: Not available.

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Potential Health Effects:
No acute exposure studies were found for soya lecithin in humans. The dust is predicted to be irritating to the eyes, skin, and respiratory tract from mechanical action. Inhalation of lecithin aerosols may cause pulmonary edema. It may cause occupational asthma from pulmonary sensitization. Acute ingestion may affect the liver (fatty liver degeneration).

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: Not available.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

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

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Lecithin

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
This product is not classified according to the EU regulations.
Not applicable.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

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

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 12:13 PM

Last Updated: 10/11/2005 12:13 PM

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MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet complies with the Canadian Controlled Product Regulations and the United States Occupational Safety and Health Administration (OSHA) hazard communication standard.

1. Product and Supplier Identification

Product: **Methanol (CH_3OH)**

Synonyms: Methyl alcohol, methyl hydrate, wood spirit, methyl hydroxide

Product Use: Solvent, fuel, feedstock

Company Identification: **Methanex Corporation, 1800 Waterfront Centre, 200 Burrard Street, Vancouver, B.C. V6C 3M1**

Importer: **Methanex Methanol Company Suite 1150 – 15301 Dallas Parkway Addison, Texas 75001 Telephone: (972) 702-0909**

Non-Emergency Tel. #: (604) 661-2600

Emergency Tel. #: (CHEMTREC) 1-800-424-9300 (Canada and US)

Note: CHEMTREC number to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

2. Composition

Component	% (w/w)	Exposure Limits*	LD_{50}	LC_{50}
Methanol (CAS 67-56-1)	99-100	ACGIH TLV-TWA: 200 ppm, skin STEL: 250 ppm, skin notation OSHA PEL: 200 ppm TLV Basis, critical effects: neuropathy, vision, central nervous system	5628 mg/kg (oral/rat) 20 ml/kg (dermal/ rabbit)	64000 ppm (inhalation/rat)

* Exposure limits may vary from time to time and from one jurisdiction to another. Check with local regulatory agency for the exposure limits in your area.

3. Hazards Identification

Routes of Entry:

Skin Contact: Moderate Eye Contact: Moderate Ingestion: Major Inhalation: Major

Effects of Short-Term (Acute) Exposure:

Inhalation: Inhalation of high airborne concentrations can also irriate mucous membranes, cause headaches, sleepiness, nausea, confusion, loss of consciousness, digestive and visual disturbances and even death. NOTE: Odour threshhold of methanol is several times higher than the TLV-TWA. Depending upon severity of poisoning and the promptness of treatment, survivors may recover completely or may have permanent blindness, vision disturbances and/or nervous system effects. Concentrations in air exceeding 1000 ppm may cause irritation of the mucous membranes.

Skin Contact: Methanol is moderately irritating to the skin. Methanol can be absorbed through the skin and harmful effects have been reported by this route of entry. Effects are simialr to those described in “Inhalation”

Eye Contact: Methanol is a mild to moderate eye irritant. High vapour concentration or liquid contact with eyes causes irritation, tearing and burning.

Ingestion: Swallowing even small amounts of methanol could potentially cause blindness or death. Effects of sub lethal doses may be nausea, headache, abdominal pain, vomiting and visual disturbances ranging from blurred vision to light sensitivity.

Effects of Long-Term (Chronic) Exposure: Repeated exposure by inhalation or absorption may cause systemic poisoning, brain disorders, impaired vision and blindness. Inhalation may worsen conditions such as emphysema or bronchitis. Repeated skin contact may cause dermal irritation, dryness and cracking.

Medical Conditions Aggravated By Exposure: Emphysema or bronchitis.

4. First Aid Measures

Note: *Emergency assistance may also be available from the local poison control centre.*

Eye Contact: Remove contact lenses if worn. In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower eyelids occasionally. Obtain medical attention.

Skin Contact: In case of contact, remove contaminated clothing. In a shower, wash affected areas with soap and water for at least 15 minutes. Seek medical attention if irritation occurs or persists. Wash clothing before reuse.

Inhalation: Remove to fresh air, restore or assist breathing if necessary. Obtain medical attention.

Ingestion: Swallowing methanol is potentially life threatening. Onset of symptoms may be delayed for 18 to 24 hours after digestion. If conscious and medical aid is not immediately

available, do not induce vomiting. In actual or suspected cases of ingestion, transport to medical facility immediately.

NOTE TO PHYSICIAN: Acute exposure to methanol, either through ingestion or breathing high airborne concentrations can result in symptoms appearing between 40 minutes and 72 hours after exposure. Symptoms and signs are usually limited to CNS, eyes and gastrointestinal tract. Because of the initial CNS's effects of headache, vertigo, lethargy and confusion, there may be an impression of ethanol intoxication. Blurred vision, decreased acuity and photophobia are common complaints. Treatment with ipecac or lavage is indicated in any patient presenting within two hours of ingestion. A profound metabolic acidosis occurs in severe poisoning and serum bicarbonate levels are a more accurate measure of severity than serum methanol levels. Treatment protocols are available from most major hospitals and early collaboration with appropriate hospitals is recommended.

5. Fire Fighting Measures

Flash point: 11°C (TCC)
Autoignition temperature: 385 °C (NFPA 1978), 470 °C (Kirk-Othmer 1981; Ullmann 1975)
Lower Explosive Limit: 6% (NFPA, 1978)
Upper Explosion Limit: 36% (NFPA, 1978), 36.5% (Ullmann, 1975)
Sensitivity to Impact: Low

Sensitivity to Static Discharge: Low

Hazardous Combustion Products: Toxic gases and vapours; oxides of carbon and formaldehyde.

Extinguishing Media: Small fires: Dry chemical, CO_2, water spray
Large fires: Water spray, AFFF(R) (Aqueous Film Forming Foam (alcohol resistant)) type with either a 3% or 6% foam proportioning system.

Fire Fighting Instructions: Methanol burns with a clean clear flame that is almost invisible in daylight. Stay upwind! Isolate and restrict area access. Concentrations of greater that 25% methanol in water can be ignited. Use fine water spray or fog to control fire spread and cool adjacent structures or containers. Contain fire control water for later disposal. Fire fighters must wear full face, positive pressure, self-contained breathing apparatus or airline and appropriate protective clothing. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD INDEX:

HEALTH: 1

FLAMMABILITY: 3

REACTIVITY: 0

6. Accidental Release Measures

Overview: Flammable liquid which can burn without a visible flame. Release can cause an immediate risk of fire and explosion. Eliminate all ignition sources, stop leak and use absorbent materials. If necessary, contain spill by diking. Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapour and fire hazard. Maximize methanol recovery for recycling or re-use. Restrict access to area until completion of cleanup. Ensure cleanup is conducted by

trained personnel only. Wear adequate personal protection and remove all sources of ignition. Notify all governmental agencies as required by law.

Personal Protection: Full face, positive pressure self-contained breathing apparatus or airline, and protective clothing must be worn. Protective fire fighting structural clothing is not effective protection from methanol.

Environmental Precautions: Biodegrades easily in water Methanol in fresh or salt water may have serious effects on aquatic life. A study on methanol's toxic efffects on sewage sludge bacteria reported little effect on digestion at 0.1% while 0.5% methanol retarded digestion. Methanol will be broken down to carbon dioxide and water.

Remedial Measures: Flammable liquid. Release can cause an immediate fire/explosion hazard. Eliminate all sources of ignition, stop leak and use absorbent materials. Collect liquid with explosion proof pumps. Do not walk through spill product as it may be on fire and not visible.

Large Spills: If necessary, contain spill by diking. Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapour and fire hazard. Maximize methanol recovery for recycling or reuse. Collect liquid with explosion proof pumps.

Small Spills: Soak up spill with non-combustible absorbent material. Recover methanol and dilute with water to reduce fire hazard. Prevent spilled methanol from entering sewers, confined spaces, drains, or waterways. Restict access to unprotected personnel. Full. Put material in suitable, covered, labeled containers. Flush area with water.

7. Handling and Storage

Handling Procedures: No smoking or open flame in storage, use or handling areas. Use explosion proof electrical equipment. Ensure proper electrical grouding procedures are in place.

Storage: Store in totally enclosed equipment, designed to avoid ignition and human contact. Tanks must be grounded, vented, and should have vapour emission controls. Tanks must be diked. Avoid storage with incompatible materials. Anhydrous methanol is non-corrosive to most metals at ambient temperatures except for lead, nickel, monel, cast iron and high silicon iron. Coatings of copper (or copper alloys), zinc (including galvanized steel), or aluminum are unsuitable for storage. These materials may be attacked slowly by the methanol. Storage tanks of welded construction are normally satisfactory. They should be designed and built in conformance with good engineering practice for the material being stored. While plastics can be used for short term storage, they are generally not recommended for long-term storage due to deterioration effects and the subsequent risk of contamination.

Corrosion rates for several construction materials:

<0.508 mm/year	Cast iron, monel, lead, nickel
<0.051 mm/year	High silicon iron
Some attack	Polyethylene
Satisfactory	Neoprene, phenolic resins, polyesters, natural rubber, butyl rubber
Resistant	Polyvinyl chloride, unplasticized

8. Exposure Controls, Personal Protection

Engineering Controls: In confined areas, local and general ventilation should be provided to maintain airborne concentrations beloew permissable exposure limits. Ventilation systems must be designed according to approved engineering standards.

Respiratory Protection: NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

Skin protection: Butyl and nitrile rubbers are recommended for gloves. Check with manufacturer. Wear chemical resistant pants and jackets, preferably of butyl or nitrile rubber. Check with manufacturer.

Eye and Face Protection: Face shield and chemical splash goggles when transferring is taking place.

Footwear: Chemical resistant, and as specified by the workplace.

Other: Eyewash and showers should be located near work areas. NOTE: PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean, fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure aadequate protection.

9. Physical and Chemical Properties

Appearance: Liquid, clear, colourless
Odour: Mild characteristic alcohol odour
Odour Threshold: detection: 4.2 - 5960 ppm
(geometric mean) 160 ppm
recognition: 53 – 8940 ppm
(geometric mean) 690 ppm
pH: Not applicable
Vapour Pressure: 12.8 kPa @ 20^{o}C
Solubility: Completely soluble
Vapour Density: 1.105 @ 15 ^{o}C
Freezing Point: -97.8 ^{o}C

Boiling Point: 64.7 ^{o}C @ 101.3 kPa
Critical Temperature: 239.4 ^{o}C
Relative Density: 0.791
Evaporation Rate: 4.1 (n-butyl acetate =1)

Partition Coefficient: Log P (oct) = -0.82
Solubility in other Liquids: Soluble in all proportions in other alcohols, esters, ketones, ethers and most other organic solvents

10. Stability and Reactivity

Chemical Stability: Yes

Incompatibility: Yes. Avoid contact with strong oxidizers, strong mineral or organic acids, and strong bases. Contact with these materials may cause a violent or explosive reaction. May be corrosive to lead, aluminum, magnesium, and platinum.

Conditions of Reactivity: Presence of incompatible materials and ignition sources.

Hazardous Decomposition Products: Formaldehyde, carbon dioxide, and carbon monoxide.

Hazardous Polymerization: Will not occur.

11. Toxicological Information

LD_{50}:	5628 mg/kg (oral/rat), 20 ml/kg (dermal/rabbit)
LC_{50}	64000 ppm (rat)
Acute Exposure:	See Section 3
Chronic Exposure:	See Section 3.
Exposure Limits:	See Section 2.
Irritancy:	See Section 3.
Sensitization:	No
Carcinogenicity:	Not listed by IARC, NTP, ACGIH, or OSHA as a carcinogen.
Teratogenicity:	No
Reproductive toxicity:	Reported to cause birth defects in rats exposed to 20,000 ppm
Mutagenicity:	Insufficient data
Synergistic products:	None Known

12. Ecological Information

Environmental toxicity: Methanol in fresh or salt water may have serious effects on aquatic life. A study on methanol's toxic effects on sewage sludge bacteria reported little effect on digestion at 0.1% while 0.5% methanol retarded digestion. Methanol will be broken down into carbon dioxide and water.

Biodegradability: Biodegrades easily in water.

13. Disposal Considerations

Review federal, provincial or state, and local government requirements prior to disposal. Store material for disposal as indicated in Section #7, ***Handling and Storage***. Disposal by controlled incineration or by secure land fill may be acceptable.

14. Transport Information

Transport of Dangerous Goods (TDG and CLR):	Methanol, Class 3(6.1), UN1230, P.G. II Limited Quantity: ≤ 1 litres
United States Department of Transport (49CFR): (Domestic Only)	Methanol, Class 3, UN 1230, P.G. II, (RQ 5000 lbs/2270 kg) Limited Quantity: ≤ 1 litres
International Air Transport Association (IATA):	Methanol, Class 3(6.1), UN1230, P.G. II Packaging Instruction: 305, 1 litre maximum per package,
International Maritime Organization (IMO):	Methanol, Class 3(6.1), UN1230, P.G. II, Flash Point = 12 ^{o}C EmS No. F-E, S-D Stowage Category "B", Clear of living quarters

15. Regulatory Information

CANADIAN FEDERAL REGULATIONS:

CEPA, DOMESTIC SUBSTANCES LIST: Listed

WHMIS CLASSIFICATION: B2, D1A

UNITED STATES REGULATIONS:

29CFR 1910.1200 (OSHA):	Hazardous
40CFR 116-117 (EPA):	Hazardous
40CFR 355, Appendices A and B:	Subject to Emergency Planning and Notification
40CFR 372 (SARA Title III):	Listed
40CFR 302 (CERCLA):	Listed

16. Other Information

Preparation Date: October 13, 2005

Prepared by: Kel-Ex Agencies Ltd., P.O. Box 52201, Lynnmour RPO, North Vancouver, B.C., V7J 3V5

Disclaimer: The information above is believed to be accurate and represents the best information currently available to us. Users should make their own investigations to determine the suitability of the information for their particular purposes. This document is intended as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.

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Revisions: None

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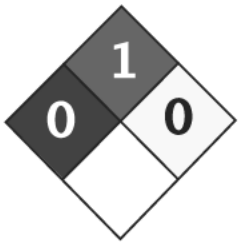

Health	0
Fire	1
Reactivity	0
Personal Protection	A

Material Safety Data Sheet
Palm oil MSDS

Section 1: Chemical Product and Company Identification

Product Name: Palm oil

Catalog Codes: SLP4939

CAS#: 8002-75-3

RTECS: RJ3696300

TSCA: TSCA 8(b) inventory: Palm oil

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Not available.

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
Palm oil	8002-75-3	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
Hazardous in case of ingestion.
Slightly hazardous in case of inhalation.
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.

Section 4: First Aid Measures

Eye Contact: No known effect on eye contact, rinse with water for a few minutes.

Skin Contact: No known effect on skin contact, rinse with water for a few minutes.

Serious Skin Contact: Not available.

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

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

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

Auto-Ignition Temperature: 316°C (600.8°F)

Flash Points: CLOSED CUP: 162°C (323.6°F).

Flammable Limits: Not available.

Products of Combustion: Not available.

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

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

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

Large Spill:
If the product is in its solid form: Use a shovel to put the material into a convenient waste disposal container. If the product is in its liquid form: Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

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

Personal Protection: Safety glasses. Lab coat.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: Not available.

Color: Not available.

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

Boiling Point: Not available.

Melting Point: 35°C (95°F)

Critical Temperature: Not available.

Specific Gravity: 0.952 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:
Hazardous in case of ingestion.
Slightly hazardous in case of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

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

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Palm oil

Other Regulations: Not available..

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
This product is not classified according
to the EU regulations.

HMIS (U.S.A.):

Health Hazard: 0

Fire Hazard: 1

Reactivity: 0

Personal Protection: a

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

Health: 0

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Not applicable.
Lab coat.
Not applicable.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 11:09 AM

Last Updated: 10/10/2005 11:09 AM

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CONESTOGA-ROVERS
& ASSOCIATES

6320 Rothway Street, Suite 100, Houston, TX 77040
Telephone: 713-734-3090 Facsimile: 713-734-3391

Union Pacific Railroad
5701 West Vickery Blvd - Room 204
Fort Worth, Texas 76109

Invoice # : 85357
Project : 39271
Project Name : UPRR - Belmead
Invoice Group : **
Invoice Date : 2/15/2006

Purchase Order :

Attention: James Pierce

TERMS: Net 30 Days. Service Charge of 1½% per month payable on overdue accounts.

For Professional Services Rendered through: 1/31/2006

Total Project Fee Authorized	5,880.00
Percent Complete	100.00
Fee Earned To Date	5,880.00
Less Previous Billing	3,200.00
Current Billing Amount	2,680.00
Amount Due This Invoice **	**2,680.00**

Larry Rowland

REMITTANCE ADDRESS
Conestoga-Rovers & Associates, Inc.
Department 406
P.O. Box 8000
Buffalo, NY 14267

EQUAL EMPLOYMENT OPPORTUNITY EMPLOYER

CONESTOGA-ROVERS
& ASSOCIATES

6320 Rothway Street, Suite 100, Houston, TX 77040
Telephone: 713-734-3090 Facsimile: 713-734-3391

Union Pacific Railroad
5701 West Vickery Blvd - Room 204
Fort Worth, Texas 76109

Invoice # : 71945
Project : 39271
Project Name : UPRR - Belmead
Invoice Group : **
Invoice Date : 8/22/2005

Purchase Order :

Attention: James Pierce

TERMS: Net 30 Days. Service Charge of 1½% per month payable on overdue accounts.

For Professional Services Rendered through: 7/31/2005

Total Project Fee Authorized	5,880.00
Percent Complete	0.55
Fee Earned To Date	3,200.00
Less Previous Billing	0.00
Current Billing Amount	3,200.00
**Amount Due This Invoice ** **	**3,200.00**

Larry Rowland

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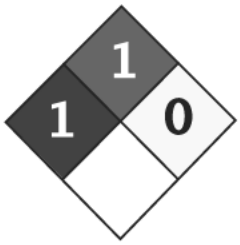

Health	1
Fire	1
Reactivity	0
Personal Protection	A

Material Safety Data Sheet
Soybean oil MSDS

Section 1: Chemical Product and Company Identification

Product Name: Soybean oil

Catalog Codes: SLS3322, SLS1105

CAS#: 8001-22-7

RTECS: WG4862000

TSCA: TSCA 8(b) inventory: Soybean oil

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Not available.

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
Soybean oil	8001-22-7	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

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

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact: No known effect on eye contact, rinse with water for a few minutes.

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: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

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

Auto-Ignition Temperature: 445°C (833°F)

Flash Points: CLOSED CUP: 282°C (539.6°F).

Flammable Limits: Not available.

Products of Combustion: Not available.

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

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

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

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe gas/fumes/ vapour/spray.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

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

Personal Protection: Safety glasses. Lab coat.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: Not available.

Color: Not available.

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

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not available.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Not available.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Not available.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: Not available.

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

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

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

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Soybean oil
TSCA 8(b) inventory: Soybean oil

Other Regulations: Not available..

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
This product is not classified according
to the EU regulations.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: a

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

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Not applicable.
Lab coat.
Not applicable.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 06:37 PM

Last Updated: 10/09/2005 06:37 PM

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technical

Material Safety Data Sheet

22023 - PREFERENCE 100 SOYBEAN OIL -005

CAS No:	008001-22-7						
Product Description:	Soybean Oil, Citric Acid and Dimethylpolysiloxane						
Trade Name/Synonyms:	SBO, Liquid Soybean Oil	**HMIS Code:**	H	F	R	P
Chemical Family:	Glyceride Oils		0	1	0	A

Section I - Manufacturing Identification

Manufacturer's Name:	Cargill, Incorporated
Address:	DSO NA, PO Box 5396 Minneapolis, Minnesota 55440
24 Hour Emergency Assistance:	Chemtrec: (800) 424-9300
General MSDS Assistance:	Dsoqa_Datarequest@cargill.com

Section II - Hazardous Ingredients / Identity Information

Is not hazardous under the Department of labor definitions. Is Generally Recognized as Safe (GRAS) under the Food, Drug and Cosmetic Act.

Section III - Physical / Chemical Characteristics

Boiling Range:	Not applicable	**Vapor Density:**	Exceeds 1.0
Specific Gravity (H20=1):	0.920 - 0.925	**Vapor Pressure:**	Not applicable
Percent Volatile by Volume:	0%	**Solubility in Water:**	Insoluble
Evaporation Rate:	Not applicable	**Weight/Gallon:**	7.7 lbs at 60°F
Appearance and Odor:	A pale yellow, oily liquid with only a faint odor in liquid state.	**Melting Point:**	

Section IV - Fire and Explosion Hazard Data

Flammability Classification:	Combustible Liquid - Class IIIB		
Flash Point:	> 625°F when FFA < 0.05%	**Method Used:**	Cleveland Open Cup
Extinguishing Media:	UL listed Type 'K' fire extinguisher, UL wet chemical extinguishing system or water spray.		

SPECIAL FIREFIGHTING PROCEDURES: The use of self-contained breathing apparatus is recommended for fire fighters. Avoid use of water as it may spread fire by dispersing oil. Use water to keep fire-exposed containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Rags and waste paper containing this material may heat and burn spontaneously. When material presenting a large surface area, such as rags, filter clay, etc., is saturated with liquid vegetable oils or oil by-products spontaneous combustion may result.

Material Safety Data Sheet
22023 - PREFERENCE 100 SOYBEAN OIL -005

Section V - Reactivity Data

STABILITY: Spontaneous combustion can occur. See Unusual Fire and Explosion Procedures, Section IV.

CONDITIONS TO AVOID: High surface area exposure to oxygen can result in polymerization and release of heat.

INCOMPATABILITY (MATERIALS TO AVOID): None

HAZARDOUS DECOMPOSITIONS OR BY-PRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur.

Section VI - Health Hazard Data

OSHA PERMISSIBLE EXPOSURE LIMIT: As an oil mist - 15 mg/m3 and 5 mg/m3 respirable.

ACGIH THRESHHOLD LIMIT VALUE: As an oil mist - 10 mg/m3.

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Excessive inhalation of oil mist may affect the respiratory system. Oil mist is classified as a nuisance particulate by ACGIH.

SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: Sensitive individuals may experience dermatitis after long exposure of oil on skin.

HEALTH HAZARDS (ACUTE AND CHRONIC): Acute: none observed by inhalation. Chronic: none reported.

EMERGENCY AND FIRST AID PROCEDURES FOR:
* SKIN CONTACT: May be removed from skin by washing with soap and warm water.
* INHALATION: Expose individual to fresh air source.

Section VII- Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Depending on quantity of spill: (a) Small spill - add solid adsorbent, shovel into disposable container and hose down area. Clean area with detergent. (b) Large spill - Squeegee or pump into holding container. Clean area with detergent.

WASTE DISPOSAL METHOD: Dispose of in accordance with local, state, and federal regulations.

Section VIII- Control Measures

RESPIRATORY PROTECTION: In the presence of any vegetable oil mists proper respiratory protection should be worn.
VENTILATION: Intermittent clean air exchanges recommended, but not required.
PROTECTIVE GLOVES: Not normally needed.
EYE PROTECTION: Not normally needed.
OTHER PROTECTIVE CLOTHING or EQUIPMENT: Not normally needed.
WORK/HYGIENIC PRACTICES: Normal good work practice.

Section IX- Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store away from flame and fire, AND excessive heat.

Material Safety Data Sheet

22023 - PREFERENCE 100 SOYBEAN OIL -005

Section X- Disclaimer and / or Comments

We recommend that containers be either professionally reconditioned for re-use by certified firms or properly disposed of by certified firms to help reduce the possibility of an accident. Disposal of containers should be in accordance with applicable federal, state and local laws and regulations. "Empty" drums should not be given to individuals.

The information in this MSDS was obtained from sources that we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied, regarding its accuracy or correctness.

The conditions of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

contact
Cargill Dressings, Sauces & Oils / Box 5693 / Minneapolis, MN 55440 / 866-382-2787 / Dscga_Datarequest@cargill.com

The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

Material Safety Data Sheet

SULFURIC ACID 77-100% (containing Chlorine)

6294CR Revised 25-FEB-2005

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

CAS Number	: 7664-93-9
Formula	: H2SO4
Molecular Weight	: 98.08
CAS Name	: SULFURIC ACID
Grade	: 77 to 100% TECHNICAL

Tradenames and Synonyms

DIHYDROGEN SULFATE
OIL OF VITRIOL
SULPHURIC ACID
VITRIOL BROWN OIL

Tradenames and Synonyms (Remarks)

See Additional Information Section for Business Sites Information.

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Chemical Solutions Enterprise
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS

Product Information	: 1-800-441-7515
Transport Emergency	: CHEMTREC 1-800-424-9300
Medical Emergency	: 1-800-441-3637

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
SULFURIC ACID	7664-93-9	
60 DEG TECHNICAL		77.7
66 DEG TECHNICAL		93.2
1.835 ELECTROLYTE		93.2
98% TECHNICAL		98
99% TECHNICAL		99
100% TECHNICAL		100
WATER	7732-18-5	0-22
CHLORINE	7782-50-5	<30 ppm

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

STRONG ACID MISTS CONTAINING SULFURIC ACID

HAZARDS IDENTIFICATION

Potential Health Effects

Exposure to Sulfuric Acid mists by inhalation may cause irritation of the nose and throat with sneezing, sore throat or runny nose; non-specific effects such as headache, nausea and weakness. Gross overexposure may cause irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath. Pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed. Repeated and/or prolonged exposure to mists may cause corrosion of teeth.

Skin contact with liquid Sulfuric Acid may cause skin corrosion, burns or ulcers. Contact with a 1 % solution may cause slight irritation with itching, redness or swelling. Repeated and/or prolonged exposure to mists may cause irritation with itching, burning, redness, swelling or rash.

Eye contact with liquid Sulfuric Acid may cause eye corrosion or ulceration; blindness may result. Repeated and/or prolonged exposure to mists may cause eye irritation with tearing, pain or blurred vision.

Immediate effects of ingestion of Sulfuric Acid may include burns of the mouth, throat, esophagus and stomach, with severe pain, bleeding, vomiting, diarrhea and collapse of blood pressure - damage may appear days after exposure.

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the lungs.

The International Agency for Research on Cancer (IARC) classified "strong inorganic acid mists containing sulfuric acid" as a Category 1 carcinogen, a substance that is "carcinogenic to humans". This classification is for strong inorganic acid mists only and does not apply to sulfuric acid or sulfuric acid solutions. The basis for the IARC classification rests on several epidemiology studies which have several deficiencies. These studies did not account for exposure to other substances, some known to be animal or potential human carcinogens, social influences (smoking, etc.) and included small numbers of subjects. Based on the overall weight of evidence from all human and chronic animal studies, no definitive casual relationship between sulfuric acid mist exposure and respiratory tract tumors has been shown.

(HAZARDS IDENTIFICATION - Continued)

"Strong inorganic acid mists containing sulfuric acid" are also listed by The National Toxicology Program (NTP) as "known human carcinogens." This limits the classification to sulfuric acid aerosols and does not extend to the liquid product, unless the acid is used under conditions that result in the formation of mists or aerosols. Fuming acid is covered by the classification.

Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

Material	IARC	NTP	OSHA	ACGIH
STRONG ACID MISTS CONTAINING SULFURIC ACID	1	X		A2

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Please note: Symptoms may be delayed; prompt medical attention may be required. Call a physician.

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.

While the patient is being transported to a medical facility, continue the application of cold, wet compresses. If medical treatment must be delayed, repeat the flushing with cold water or soak the affected area with cold water to help remove the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of treatment.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Give large quantity of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

(FIRST AID MEASURES - Continued)

Notes to Physicians

Continued washing of the affected area with cold or iced water will be helpful in removing the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of the treatment.

FIRE FIGHTING MEASURES

Flammable Properties

Will not burn.

Fire and Explosion Hazards:

Reacts with most metals, especially when dilute, to give flammable, potentially explosive hydrogen gas. Follow appropriate National Fire Protection Association (NFPA) codes.

Extinguishing Media

Use media appropriate for surrounding material.

Use water spray to cool containers exposed to fire; do not get water inside containers.

Fire Fighting Instructions

Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Generates heat upon addition of water, with possible spattering. Wear full protective clothing. Runoff from fire control may cause pollution. Neutralize run-off with lime, soda ash, etc., to prevent corrosion of metals and formation of hydrogen gas. Wear self-contained breathing apparatus if fumes or mists are present.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

(ACCIDENTAL RELEASE MEASURES - Continued)

Accidental Release Measures

Stop flow if possible. Review "Fire and Explosion Hazards" and "Safety Precautions" before proceeding with clean up. Use appropriate protective equipment during clean up. Soak up small spills with dry sand, clay or diatomaceous earth. Dike large spills, and cautiously dilute and neutralize with lime or soda ash, and transfer to waste water treatment system. Prevent liquid from entering sewers, waterways, or low areas.

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the Reportable Quantity is 1,000 lbs. (based on the sulfuric acid content of the solution spilled). Comply with Federal, State, and local regulations on reporting releases.

DuPont Emergency Exposure Limits (EEL) are established to facilitate site or plant emergency evacuation and specify airborne concentrations of brief durations which should not result in permanent adverse health effects or interfere with escape. EEL's are expressed as airborne concentration multiplied by time (CxT) for up to a maximum of 60 minutes and as a ceiling airborne concentration. These limits are used in conjunction with engineering controls/monitoring and as an aid in planning for episodic releases and spills. For more information on the applicability of EEL's, contact DuPont.

The DuPont Emergency Exposure Limit (EEL) for Sulfuric Acid is 10 mg/m3 for 15 to 60 minutes and 20 mg/m3 for up to 15 minutes with a not-to-exceed ceiling of 20 mg/m3.

HANDLING AND STORAGE

Handling (Personnel)

Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or mist. Wash thoroughly after handling. Use with sufficient ventilation to keep employee exposure below recommended limits.

Keep containers closed. Do not add water to contents while in container because of violent reaction.

When loading or transferring acid do NOT breathe vapors. Stay upwind!

(HANDLING AND STORAGE - Continued)

Storage

Keep out of sun and away from heat, sparks, and flame. Keep container tightly closed and (drum) closure up to prevent leakage. Loosen closure carefully. Relieve internal pressure when received and at least weekly thereafter. Do not use pressure to empty. Be sure closure is securely fastened before moving container. Do not wash out container or use it for other purposes; replace closure after each withdrawal and return it with empty container.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Good general ventilation should be provided to keep vapor and mist concentrations below the exposure limits.

Personal Protective Equipment

Have available and wear as appropriate for exposure conditions when handling containers or operating equipment containing sulfuric acid: chemical splash goggles; full-length face shield/chemical splash goggles combination; acid-proof gauntlet gloves, apron, and boots; long sleeve wool, acrylic, or polyester clothing; acid proof suit and hood; and appropriate NIOSH respiratory protection. In case of emergency or where there is a strong possibility of considerable exposure, wear a complete acid suit with hood, boots, and gloves. If acid vapor or mist are present and exposure limits may be exceeded, wear appropriate NIOSH respiratory protection.

Exposure Guidelines

Exposure Limits
SULFURIC ACID 77-100% (containing Chlorine)

PEL	(OSHA)	: 1 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	: 0.2 mg/m3, 8 Hr. TWA A2 (Sulfuric acid contained in strong inorganic acid mists)
AEL *	(DuPont)	: 0.5 mg/m3, 8 & 12 Hr. TWA 1.5 mg/m3, 15 minute TWA

Other Applicable Exposure Limits

CHLORINE

PEL	(OSHA)	: 1 ppm, 3 mg/m3, Ceiling
TLV	(ACGIH)	: 0.5 ppm, 1.5 mg/m3, 8 Hr. TWA, A4 STEL 1 ppm, 2.9 mg/m3, A4
AEL *	(DuPont)	: 0.5 ppm, 8 & 12 Hr. TWA STEL 1 ppm, 15 minute TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: 193-327 C (379-621 F) @ 760 mm Hg
Vapor Pressure	: <0.3 mm Hg @ 25 C (77 F) <0.6 mm Hg @ 38 C (100 F)
Vapor Density	: 3.4
Melting Point	: -35 to 11 C (-31 to 52 F)
Evaporation Rate	: <1 (Butyl Acetate=1.0)
Solubility in Water	: 100 WT%
pH	: <1
Odor	: Odorless.
Form	: Oily; clear to turbid liquid
Color	: Colorless to light gray

GRADE	BOILING PT. DEG C	BOILING PT. DEG F	MELTING PT. DEG C	MELTING PT. DEG F	SPECIFIC GRAVITY
60 DEG TECHNICAL	193	380	-12	10	1.706
66 DEG TECHNICAL	279	535	-35	-31	1.835
1.835 ELECTROLYTE	279	535	-35	-31	1.835
98% TECHNICAL	327	621	-2	29	1.844
99% TECHNICAL	310	590	4	40	1.842
100% TECHNICAL	274	526	11	51	1.839

STABILITY AND REACTIVITY

Chemical Stability

Stable, but reacts violently with water and organic materials with evolution of heat.

(STABILITY AND REACTIVITY - Continued)

Incompatibility with Other Materials

Vigorous reactions with water; alkaline solutions; metals, metal powder; carbides; chlorates; fuminates; nitrates; picrates; strong oxidizing, reducing, or combustible organic materials. Hazardous gases are evolved on contact with chemicals such as cyanides, sulfides, and carbides.

Decomposition

Releases sulfur dioxide at extremely high temperatures.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

EYE:

Animal testing indicates this material is corrosive to the eye, when tested undiluted. Animal testing indicates this material is a moderate eye irritant, when tested as 10 % solution.

SKIN:

The concentrated compound is corrosive. Animal testing indicates this material is a slight skin irritant, when tested as 10 % solution.

INGESTION:

LD50, rat: 2,140 mg/kg.

INHALATION:

8 hour, LC50, guinea pigs: 30 mg/m3.
Single and repeated exposure caused: Irritation of the respiratory tract. Corrosion of the respiratory tract. Lung damage. Labored breathing. Altered respiratory rate. Pulmonary edema. Repeated exposure caused: Altered red blood cell count.

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:

(TOXICOLOGICAL INFORMATION - Continued)

No adequate animal data are available to define the carcinogenic potential of this material. Limited studies do not suggest effects. In animal testing this material has not caused developmental toxicity. No animal data are available to define the following effects of this material: reproductive toxicity. This material has not produced genetic damage in bacterial cultures. It has not been tested for genetic toxicity in mammalian cell cultures or in animals.

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:
Slightly to moderately toxic.
96 hour LC50 - Bluegill sunfish: 10.5 ppm.
48 hour TLm - Flounder: 100-300 ppm

DISPOSAL CONSIDERATIONS

Waste Disposal

Cleaned-up material may be an RCRA Hazardous Waste on disposal due to the corrosivity characteristic. Do not flush to surface water or sanitary sewer system. Comply with Federal, State, and local regulations. If approved, neutralize and transfer to waste treatment system.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO

Proper Shipping Name	: SULFURIC ACID
Hazard Class	: 8
UN No.	: 1830
DOT/IMO Label	: CORROSIVE
Packing Group	: II
Reportable Quantity	: 1000 lb (454 kg)

Shipping Containers

Tank Cars.
Tank Trucks.
Barge.

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : Yes
Fire : No
Reactivity : Yes
Pressure : No

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: Yes
CERCLA Hazardous Substance : Yes
SARA Toxic Chemical : No

State Regulations (U.S.)

Strong inorganic acid mists containing sulfuric acid are known to the State of California to cause cancer.

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating
Health : 3
Flammability : 0
Reactivity : 2

Water Reactive.

NPCA-HMIS Rating
Health : 3
Flammability : 0
Reactivity : 2

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

For further information, see Noranda-DuPont Sulfuric Acid "Storage and Handling Bulletin".

Because of its corrosive characteristics and inherent hazards, Sulfuric Acid should not be used in sewer or drain cleaners or any similar application; regardless of whether they are formulated for residential, commercial or industrial use. DuPont will not knowingly sell sulfuric acid

to individuals or companies who repackage the product for sale as sewer or drain cleaners, or any other similar use.

MANUFACTURERS

NORANDA INC.
Canadian Electrolytic Zinc
Valleyfield, Quebec J6S 4W2

NORANDA INC.
Horne Smelter
Rouyn-Noranda (Quebec) J9X 5B6

MINERAUX NORANDA INC.
Division Mines Gaspe
Murdochville Quebec G0E 1W0

NORANDA INC.
Brunswick Smelting Division
Belledune, New Brunswick E0B 1G0

FALCONBRIDGE LIMITED
Kidd Creek Division
Timmins, Ontario P4N 7K1

FALCONBRIDGE LIMITED
Sudbury Operations
Falconbridge, Ontario P0M 1S0

DUPONT
Fort Hill Plant
North Bend, Ohio 45052

DUPONT
Wurtland Plant
Wurtland, Kentucky 41144

DUPONT
James River Plant
Richmond, Virginia 23237

DUPONT
Burnside Plant
Darrow, Louisianna 70725

DUPONT
LaPorte Plant
LaPorte, Texas 77571

DUPONT CONOCO
Lake Charles Plant
West Lake, Louisianna 70669

(Continued)

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsible for MSDS : MSDS Coordinator
> : DuPont Chemical Solutions Enterprise
Address : Wilmington, DE 19898
Telephone : (800) 441-7515

# Indicates updated section.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS

Huntsman
Port Neches Performance Products
Appendix E

OIL SPILL REMOVAL TECHNIQUES

Method	Description	When to use
1. NO ACTION	No action is taken. Monitoring continues.	Extremely remote or inaccessible shorelines. When natural removal rates are very fast.
2. MANUAL REMOVAL	Remove surface oil manually (hands, rakes, shovels, etc.). No mechanized equipment.	Light to moderate oiling conditions.
3. PASSIVE COLLECTION (SORBENTS)	Remove oil by absorption onto oleophilic material placed in the intertidal zone.	As a secondary treatment method after gross oil removal, and along sensitive shorelines where access is restricted.
4. DEBRIS REMOVAL	Manual or mechanical removal of debris from the upper beach face and the zone above high tide beyond the normal wash of waves. Can include cutting and removal of oiled logs.	When driftwood and debris is heavily contaminated and either a potential source of chronic oil release, an aesthetic problem, or a source of contamination for other organisms on the shoreline.
5. TRENCHING	Remove subsurface oil from permeable substrates by digging trenches to the depth of the oil and remove oil floating on the water table by vacuum pump or super sucker. Water flooding or high-pressure spraying at ambient temperatures can be used to flush oil to the trench.	When large quantities of oil penetrate deeply into permeable sediments and cannot be removed by surface flooding. The oil must be liquid enough to flow at ambient temperatures.
6. SEDIMENT REMOVAL	Oiled sediments are removed by either manual use of hand tools or mechanical use of various kinds of motorized equipment. The oiled material must be transported and disposed of off-site.	When only very limited amounts of oiled sediments have to be removed. Should not be considered where beach erosion may result. Remove the sediments only to the depth of oil penetration, which can be difficult with heavy equipment.
7. AMBIENT – WATER FLOODING (DELUGE)	Ambient seawater is pumped through holes in header pipes and flows down the beach face to the water. On porous beaches, water flows through the substrate pushing loose oil ahead of it. Oil is trapped by booms and picked up with a skimmer or other suitable equipment.	On heavily oiled shorelines when the oil is stiff fluid and loosely adhering to the substrate; and where oil has penetrated into cobble or boulder beaches.

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Method	Description	When to use
8. AMBIENT – WATER / LOW - PRESSURE WASHING	Low-pressure washing (<50 psi) is used to flush oil to the water's edge for pickup with skimmers or sorbents. It can be used with a deluge system to prevent released oil from re-adhering to the substrate.	Where adhered oil is still fresh and must be removed due to continued release of oil.
9. AMBIENT-WATER / HIGH - PRESSURE WASHING	Similar to low-pressure washing except water pressure is up to 100 psi. Remove oil that has adhered to rocks or man-made structures. May require placement of sorbents directly below treatment areas.	When low-pressure washing is not effective for removal of oil. When directed water jet can remove oil from hard to reach sites. To remove oil from man-made structures for aesthetic reasons.
10. WARM WATER MODERATE TO HIGH-PRESSURE WASHING	Heated seawater (ambient to 90F) is applied at moderate to high. If not effective, "deluge" flooding and additional low or high-pressure washing can be used to float the oil to the water's edge for pickup. Oil is trapped by booms and picked up with skimmers or sorbents.	When oil has weathered to the point that low pressure washing with ambient water is not effective for removal of adhered oil, which must be recovered due to continued release of oil. To remove oil from man-made structures for aesthetic reasons.
11. HOT-WATER/ HIGH-PRESSURE WASHING	Water heaters mounted offshore on barges or small land-based units, heat water to temperatures from 90°F to 170°F, which is usually sprayed by hand with high-pressure wands. Requires immediate use of vacuum trucks to remove the oil/water runoff or collection with skimmers or sorbents.	When the oil has weathered to the point that even warm water at high pressure is not effective for removal of adhered oil. To remove oil from man-made structures for aesthetic reasons.
12. SLURRY SAND BLASTING	Use sandblasting equipment to remove oil from the substrate. May include recovery of used (oiled) sand in some cases.	When heavy oil residue is remaining on the shoreline, which needs to be cleaned for aesthetic reasons, and even hot-water wash is not effective.

Method	Description	When to use
13. VACUUM	Use of a vacuum unit with a suction head to recover free oil. Equipment ranges from small portable units to large super-suckers. Can be used with water spray systems to flush oil towards the suction head.	When free, liquid oil is stranded on the shoreline (usually along the high tide line) or trapped in vegetation that is readily accessible.
14. SEDIMENT REWORKING	Sediments are roto-tilled or otherwise mechanically mixed with the use of heavy equipment on gravel beds. The oiled sediments in the upper area may be relocated lower to enhance natural cleanup during reworking by wave activity (berm relocation).	On shorelines with significant amounts of subsurface oil, where sediment removal is infeasible (due to erosion concerns or disposal problems); also where surface oil deposits have started to form pavements or crusts.
15. SEDIMENT REMOVAL, CLEANSING AND REPLACEMENT	Oiled sediments are excavated using heavy equipment at low tide. The sediments are loaded into a container for cleansing process. Rinsed materials are returned to the original area. Cleaning equipment must be placed close to areas to reduce transportation problems.	Applicable on surfaces with large amounts of subsurface oil, where permanent removal of sediment is undesired and other cleanup techniques are likely to be ineffective.
16. CUTTING VEGETATION	Manual cutting of oiled vegetation using weed eater, and removal of cut vegetation with rakes. The cut vegetation is bagged immediately for disposal.	Use when the risk of oiled vegetation contaminating wildlife is greater that the value of the vegetation that is to be cut, and there is no less destructive method to remove or reduce the risk to acceptable levels.
17. CHEMICAL OIL STABILIZATION WITH ELASTOMERS	The primary purpose is to stabilize the oil, keeping it from spreading or escaping, causing oiling elsewhere. May reduce the solubility of the light (and more toxic) fractions, by locking them into the polymer. This reduces both air and water exposure. Depending on the beach type and equipment used, recovery may be enhanced.	When heavy concentrations of liquid oil are on the substrate and adjacent water body, and physical removal cannot be completed prior to the next tide so that the oil is likely to move to a more sensitive shoreline type. Should be used in conjunction with booming or other physical containment.

Method	Description	When to use
18. IN-SITU BURNING OF SHORELINES	Oil on the shoreline is burned, usually when it is on a combustible substrate such as vegetation, logs, and other debris. Oil can be burned off of nonflammable substrates with the aid of a burn promoter.	Early in the spill event, after ensuring that the product is ignitable.
19. NUTRIENT ENHANCEMENT	Nutrients are applied to the shoreline in one of several methods: soluble inorganic formulations that are dissolved in water and applied as a spray at low tide, requiring frequent applications; slow release formulations that are applied as a solid to the intertidal zone and designed to slowly dissolve; and oleophilic formulations that adhere to the oil itself, thus they are sprayed directly on the oiled areas.	On moderate to heavily oiled shorelines, after other techniques have been used to remove as much oil as possible; on lightly oiled shorelines where other techniques are not effective; and where nutrients are a limiting factor in natural degradation. Potentially for the treatment of subsurface oil.
20. MICROBIAL ADDITION	Formulations containing hydrocarbon-degrading microbes and fertilizers are added to the oiled area. To date, microbial addition has not been shown to work better than fertilizer alone in field tests.	N/A in shallow water, poorly flushed, restricted embayments, or where toxicity of nutrients (ammonia) is of concern. Use should be restricted adjacent to stream mouths, tide pool communities, etc. Other chemicals in the formulation could be toxic to aquatic organisms.

SHALLOW WATER/INLAND RESPONSE STRATEGIES

SMALL LAKES AND PONDS

Habitat Description	Lakes and ponds are standing bodies of water of variable size and water depth. Waves and currents are generally very low, although the water surface can become choppy. Water levels can fluctuate widely over time, particularly on manmade lakes. Smaller ponds can completely freeze over in winter. The bottom sediments close to shore can be soft and muddy, and the surrounding land can include wet meadows and marshes. Floating vegetation can be common. The rate of water exchange is highly variable within this group, ranging from days to years. These water bodies can include sections of a river with low flow rates (e.g., behind diversion dams) or that are somewhat isolated from regular flow (e.g., backwater lakes or oxbow lakes). Isolated water bodies, such as kettle lakes, are unique members of this category because they have no surface water outflow, and therefore have very low flushing rates. In shallow water, boat operations would be limited and most response operations would be conducted from shore.
Sensitivity	Small lakes and ponds have medium to high sensitivity to oil spill impact because of low physical removal rates, limited dilution and flushing of oil mixed into the water column, and high biological and human use. They provide valuable habitat for migrating and nesting birds and mammals, and support important fisheries. Small lakes can be the focus of local recreational activities. Wind will control the distribution of slicks, holding the oil against a lee shore or spreading it along shore and into catchment areas. Wind shifts can completely change the location of slicks, contaminating previously clean areas. Thus, early protection of sensitive areas is important. The inlet and outlet are key areas for focusing protection efforts. Oil impacts on floating vegetation depend to a large degree on dose, with possible elimination of plants at high doses. Section 5 addresses sinking oils and response under ice conditions.

Environmental impact from response methods for SMALL LAKE & POND environments.

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Booming - Deflection/Exclusion	A	A	A	A
Booming - Containment	-	A	A	A
Skimming/Vacuum	-	A	A	A
Sorbents	-	A	A	A
Natural Recovery	A	B	C	C
In-Situ Burning	B	B	B	B
Herding Agents	B	B	B	-
Debris Removal	-	B	B	B
Vegetation Removal	-	B	B	B
Physical Herding	C	B	B	B
Visco-Elastic Agents/Solidifiers	-	B	B	-
Manual Oil Removal/Cleaning	-	C	C	B
Mechanical Oil Removal	-	C	C	C
Dispersants	D	D	D	-
Emulsion Treating Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: SMALL LAKE AND POND ENVIRONMENTS	
Least Adverse Habitat Impact	*Booming* • Use containment booms to keep oil from spreading • Safety concerns limit the containment of gasoline spills; however, booms can be used to exclude or deflect the spill away from sensitive resources *Skimming/Vacuum* • Not applicable to gasoline spills because of safety concerns • Land-based operations need site-specific restrictions and monitoring to minimize physical destruction *Sorbents* • Overuse results in excess waste generation • Inhibit the evaporation of gasoline spills
Some Adverse Habitat Impact	*Natural Recovery* • Low impact for light oils but may have significant impact for medium crudes and heavier fuel oils because they persist and affect shoreline habitats *In-Situ Burning* • Less environmental impact in winter when snow and ice provide some protection, plants are dormant, and fewer animals are present • Safety concerns limit containment of gasoline, but may be safely used with natural containment, such as gasoline trapped in ice *Herding Agents* • Most effective under calm conditions • Should be coupled with recovery when used to protect sensitive habitats • Not effective on heavy oils because oil must be fluid *Debris Removal* • Debris may be associated with nests or living areas (e.g., beaver lodges), so impacts on resident animal habitat may need consideration • Operate from small boats to minimize substrate disruption *Vegetation Removal* • If oil is trapped in floating vegetation, may be only way to recover the oil in the absence of water currents • May be appropriate to prevent secondary oiling of wildlife *Physical Herding* • Care should be taken not to drive oil into the water column or sediment *Visco-Elastic Agents/Solidifiers* • Visco-elastic agents, by improving overall oil recovery from the water surface, reduce secondary shoreline oiling • Not applicable to gasoline spills because of safety concerns during application and inhibition of evaporation • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil
Probable Adverse Habitat Impact	*Manual Oil Removal/Cleaning* • Inherent inefficiency of manual removal of fluid oils would require large crews or repeated entries, resulting in disruption to substrate and wildlife • Not applicable for gasoline spills because of safety concerns *Mechanical Oil Removal* • May be needed where oil has heavily contaminated bottom sediments • May require very intrusive recovery techniques
Most Adverse Habitat Impact	*Dispersants* • Inhibit the evaporation of gasoline spills • Shallow water depths and low dilution rates may result in high aquatic toxicity from oil/dispersant mixtures

Insufficient Information	*Emulsion-Treating Agents* • Not applicable to oils that do not form emulsions, such as gasoline • Insufficient toxicity data to evaluate environmental impact of shallow freshwater environment Use *Nutrient Enrichment and Natural Microbe Seeding* • Not applicable to gasoline spills because they rapidly evaporate • There is insufficient information on impact and effectiveness for other oil types • There are special concerns about nutrient overloading in small, restricted water bodies

SMALL RIVERS AND STREAMS

Habitat Description	Small rivers and streams are characterized by shallow water (generally 1-2 meters) and narrow channels. Water flow can be highly variable, both throughout the seasons and with distance downstream. This grouping includes a wide range of water bodies, from fast-flowing streams with low falls and numerous rapids over bedrock and gravel, to slow-moving bayous bordered by low muddy banks and fringed with vegetation. Sections of the channel may be choked with log jams and debris, and mid-channel bars and islands can divide water flow into multiple channels. Both boat and vehicular access can be very limited; often the only access will be at bridge crossings. Ice may further complicate response measures in this habitat.
Sensitivity	Small rivers and streams have medium to high sensitivity to oil spill impact. Oil spills may have more of an impact on small rivers and streams than on large rivers due to a variety of conditions, such as lower flow conditions, lower dilution rates, lower overall energy, and greater range of natural habitats. Fish spawn in streams and the tributaries of larger rivers; thus, the most sensitive, early life stages can be present. Fringing wetlands and adjacent floodplains are closely connected to small rivers and streams, and they are areas of high biological use and low natural removal rates. Slicks usually contaminate both banks, and non-viscous oils are readily mixed into the entire water column in shallow streams, potentially exposing both aquatic and benthic organisms to oil. Initial weathering rates may be slower because spreading and evaporation are restricted in narrow channels and heavy vegetation cover. Fish kills are possible for spills ranging from gasoline to medium crude oils. Many different kinds of mammals, birds, reptiles, and amphibians use the stream bank habitats, and there can be localized high mortality rates of these animals. Spills can cause closure of water intakes for drinking water, irrigation, or industrial use along small rivers. A more aggressive response may be appropriate to prevent contamination of downstream habitat, particularly if water intakes, populated areas, or special habitat resources are present.

Environmental impact from response methods for SMALL RIVER & STREAM environments.

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Booming - Deflection/Exclusion	A	A	A	A
Skimming	A	A	A	A
Booming - Containment	-	A	A	A
Vacuum	-	A	A	A
Sorbents	-	A	A	A
Barriers/Berms	B	A	A	A
Physical Herding	B	B	B	B
Natural Recovery	A	B	C	C
Debris Removal	-	B	B	B
Visco-Elastic Agents/Solidifiers	B	B	B	-
Vegetation Removal	-	B	B	B
In-Situ Burning	C	B	B	B
Manual Oil Removal/Cleaning	-	C	C	B
Mechanical Oil Removal	-	C	C	C
Dispersants	D	D	D	-
Herding Agents	D	D	D	-
Emulsion Treating Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: SMALL RIVER AND STREAM ENVIRONMENTS	
Least Adverse Habitat Impact	*Booming* • Used primarily to divert slicks towards collection points in low-current areas • Safety concerns limit the containment of gasoline spills; however, booms can exclude or deflect the spill away from sensitive resources • Expect low effectiveness with fast currents, shallow water, and steep banks *Skimming/Vacuum* • To protect public health and downstream resources where spreading is limited, recovery of large gasoline spills could be attempted with firefighting foam to suppress vapors and respiratory protection for workers *Sorbents* • Deploy in booms to recover sheens in low-current areas and along shore • Trampling of stream bank and bed habitats during deployment and recovery of sorbents can disrupt streamside vegetation and drive oil into the sediment • Overuse results in excess waste generation *Barriers/Berms* • Potential for physical disruption and sediment contamination in immediate area of the barrier/berm • If all or most of the flow is diverted, may need to monitor water requirements to habitats downstream of the barrier to mitigate potential impacts • Safety concerns limit actions at gasoline spills, although berms built ahead of the slick could be used to exclude oil from sensitive areas, such as side channels
Some Adverse Habitat Impact	*Physical Herding* • May be only means to flush oil trapped in log jams, beaver dams, behind rocks, and in vegetation/debris along banks to downstream collection areas • Spraying of gasoline spills can mix the oil into the water column *Natural Recovery* • For small gasoline and diesel-like oil spills, evaporation and natural dispersion would rapidly remove surface slicks • For all other types and sizes of spills, recovery of free or pooled oil and/or protection of sensitive resources should be attempted *Debris Removal* • Will release trapped oil and speed natural flushing rates*Visco-Elastic Agents/Solidifiers* • Visco-elastic agents may speed recovery of contained oil when time is critical • Solidifiers may immobilize even gasoline spills, preventing their transport downstream and further impact • Ineffective on heavy oils, which are too viscous to allow the product to mix into the oil *Vegetation Removal* • May be needed to remove oil trapped in floating and fringing vegetation • Remove oiled vegetation to prevent chronic sheening in sensitive areas or secondary oiling of wildlife • Monitor crews to minimize physical disturbance, which can be severe *In-Situ Burning* • May be difficult to protect stream-side vegetation • Safety concerns limit containment of gasoline, but may be safely used if natural containment is present • Less impact in winter when snow/ice provide some protection, plants are dormant, and fewer animals are present • May not be practical in fast flowing streams where containment and maintenance of minimum slick thickness (1-3 millimeters) may be difficult
Probable Adverse Habitat Impact	*Manual Oil Removal/Cleaning* • Viable for heavy oils that have solidified versus fluid oils that have spread • Stream bank disruption likely from movement of work crews *Mechanical Oil Removal* • Only consider when large amounts of solidified oil have accumulated in the stream channel and need to be removed quickly

Most Adverse Habitat Impact	*Dispersants* • Enhanced mixing of oil into the water column with restricted dilution will increase acute toxicity to aquatic organisms *Herding Agents* • Toxicity concerns when early life stages are present • May not be practical due to fast currents and rough water surface • Oil must be fluid, so not appropriate to heavy oils
Insufficient Information	*Emulsion-Treating Agents* • Insufficient toxicity data to evaluate environmental impact of shallow freshwater environment use • Not applicable to oils that do not form emulsions, such as gasoline *Nutrient Enrichment and Natural Microbe Seeding* • Not applicable to gasoline spills because they rapidly evaporate • There is insufficient information on impact and effectiveness, particularly for applications in small rivers and streams

MANMADE STRUCTURES (ESI = 1B, 6B, 8B)	
Habitat Description	Manmade structures include vertical shore protection structures such as seawalls, piers, and bulkheads, as well as riprap revetments and groins, breakwaters, and jetties. Vertical structures can be constructed of concrete, wood, and corrugated metal. They usually extend below the water surface, although seawalls can have beaches or riprap in front of them. Riprap revetments are constructed of boulder-sized pieces of rock, rubble, or formed concrete pieces (e.g., tetrapods), placed parallel to the shoreline for shore protection. Riprap groins are oriented perpendicular to shore to trap sediment; jetties are designed to protect and maintain channels; and breakwaters are offshore structures constructed to protect an area from wave attack. Riprap structures have very large void spaces and are permeable, while seawalls and bulkheads have impermeable, solid substrates. These structures are very common along developed shores, particularly in harbors, marinas, and residential areas. The range in degree of exposure to waves and currents varies widely, from very low in dead-end canals, to very high on offshore breakwaters. Boat wakes can generate wave energy in otherwise sheltered areas.
Sensitivity	Manmade structures have a range of sensitivities to oil spills, depending on the degree of exposure to natural removal processes. Biological communities and use are sparse. Often, there are sources of pollutants or habitat degradation nearby, such as urban runoff, chronic small oil spills in marinas, poor water quality, and limited water circulation. More intrusive cleanup techniques are often conducted due to their lower biological use, higher public demand for oil removal for aesthetic reasons, and need to minimize human exposure to oil in populated areas. It is acknowledged that manmade structures can vary in permeability, cohesion, and mobility and, in turn, how they are affected by oiling. In this document, however, manmade structures have been grouped together so that the higher degree of cleanup often required can be adequately addressed. Vertical structures are generally impermeable to oil penetration, but oil can heavily coat rough surfaces, forming a band at the water line. During storms, oil can splash over the top and contaminate terrestrial habitats. Riprap poses significant cleanup problems because of large void spaces between the riprap and heavy accumulations of debris. Large amounts of oil can become trapped in the riprap, where it is difficult to remove and a potential source of sheening.

Environmental impact from response methods for MANMADE structures(ESI = 1B, 6B, 8B).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Manual Oil Removal/Cleaning	-	A	A	A
Debris Removal	-	A	A	A
High-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	B	A	A	B
Vacuum	-	B	A	A
Natural Recovery	A	A	B	B
Flooding	B	A	A	C
Low-Pressure, Cold-Water Flushing	B	A	A	C
Low-Pressure, Hot-Water Flushing	-	B	B	B
High-Pressure, Hot-Water Flushing	-	B	B	B
Shoreline Cleaning Agents	-	B	B	B
Solidifiers	B	B	B	-
In-Situ Burning	-	B	B	B
Nutrient Enrichment	-	C	C	D
Steam Cleaning	-	C	C	C
Chemical Shoreline Pretreatment	-	I	I	I

SAND HABITATS (ESI = 4)	
Habitat Description	Sand habitats have a substrate composed of sediments that are predominantly finer than 2 millimeters but greater than silt or clay-sized material. The shoreline may consist of well-sorted sands of one principal size, or of poorly sorted mixtures of muddy sand, gravelly sand, or a combination of these two. When the sediments are fine-grained sand, beaches may be wide and flat; where the sediments are coarse-grained sand, they usually are steeper and narrower. Sandy shorelines may be naturally eroding, accreting, or stable, and groins or breakwaters may be placed to trap sand and maintain some beaches. Exposed sand beaches can undergo rapid erosional or depositional changes during storms. In developed areas, sand beaches can be artificially created by man and are commonly used for recreation. Sand bars and banks along rivers are also included in this habitat.
Sensitivity	Sand habitats have low to medium sensitivity to oil spills. They generally do not have sizable biological communities except where the habitat tends to be protected and consists of poorly sorted muddy sediments. Thus, ecological effects are likely to be of limited extent because of the low natural biological productivity. In developed areas, sand beaches are considered sensitive because of their high recreational use. During small spills, oil will concentrate in a band along the swash line. Maximum penetration into fine-grained sand will be less than 15 centimeters; penetration in coarse sand can reach 25 centimeters or greater. Clean sand can bury oiled layers quickly, creating more difficult cleanup issues. On heavily used recreational beaches, extensive cleanup is usually required to remove as much of the oil as possible. When large amounts of sediment must be removed, it may be necessary to replace these sediments with clean material. Traffic on sand can push oil deeper.

Environmental impact from response methods for SAND habitats (ESI = 4).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Debris Removal	-	A	A	A
Natural Recovery	A	A	B	B
Flooding	B	A	A	B
Sorbents	-	A	A	B
Manual Oil Removal/Cleaning	D	B	A	A
Mechanical Oil Removal	D	B	B	A
Low-Pressure, Cold-Water Flushing	B	B	B	B
Vacuum	-	B	B	B
Sediment Reworking	D	B	B	B
Nutrient Enrichment	-	B	B	C
Shoreline Cleaning Agents	-	-	B	B
Solidifiers	-	B	B	-
In-Situ Burning	-	-	B	B
Low-Pressure, Hot-Water Flushing	D	C	C	B
High-Pressure Hot-Water Flushing	D	D	D	D
High-Pressure, Cold-Water Flushing	D	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: SAND HABITATS	
Least Adverse Habitat Impact	*Debris Removal* • Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources *Natural Recovery* • Lower impact for small spills, lighter oil types, and remote areas *Flooding* • Only effective when the oil is fluid and on the sand surface, rather than penetrated or buried • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats *Sorbents* • Not applicable to gasoline spills because they rapidly evaporate • Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents • Overuse results in excess waste generation
Some Adverse Habitat Impact	*Manual Oil Removal/Cleaning* • Minimizes sediment removal and problems of erosion and waste disposal • Effective when oil is mostly on the surface, not buried beneath clean sand • Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated by manual cleanup are not balanced by benefits in removing oil *Mechanical Oil Removal* • Tends to remove large amounts of clean sand with the oiled sand • Use on high-use beaches where rapid removal of oil is required and where long stretches of shoreline are heavily oiled • Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated from mechanical cleanup are not balanced by benefits in removing oil *Low-Pressure, Cold-Water Flushing* • Only effective when the oil is fluid and adheres loosely to the sediments • Optimize pressure to minimize the amount of sand washed downslope *Vacuum* • Early use of vacuum on pooled, liquid oil can prevent deeper penetration • Will minimize amount of sorbent waste when used with flushing efforts • Can vacuum heavy, non-sticky oil from sand substrates completely, but slowly *Sediment Reworking* • Appropriate for lightly oiled and stained sediments, to speed removal rates, and as a final step to polish recreational beaches • Because gasoline tends to quickly evaporate, habitat disruption, worker safety concerns, and waste generated from sediment reworking are not balanced by benefits in removing oil *Nutrient Enrichment* • Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues • May be concern about nutrient overloading in poorly flushed areas • Not applicable to gasoline spills because they rapidly evaporate *Shoreline Cleaning Agents* • May be only technique to remove viscous oils without removing sediment • Individual products vary in their toxicity and ability to recover the treated oil *Solidifiers* • Not applicable to gasoline spills because they rapidly evaporate • Early use may prevent pooled oil from penetrating deeper • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil *In-Situ Burning* • Can effectively remove pooled surface oil accumulations • Concerns about air pollution, physical nature of the residue, and thermal impact on biota • May have to dig trenches to accumulate oil in pools • Lighter oils will penetrate the sand, leaving insufficient surface concentrations to burn

Probable Adverse Habitat Impact	*Low-Pressure, Hot-Water Flushing* • May be needed to soften and lift sticky oil off the sand surface • Any organisms present will be adversely affected by hot water
Most Adverse Habitat Impact	*High-Pressure, Cold-Water Flushing And High-Pressure, Hot-Water Flushing* • High-pressure water jets will fluidize sand-sized sediments, erode the beach, and wash the oiled sediment into nearshore habitats
Insufficient Information	*Chemical Shoreline Pretreatment* • More information needed on available products, their effectiveness, and impact *Natural Microbe Seeding* • There is insufficient information on impact and effectiveness in freshwater habitats

MIXED SAND AND GRAVEL HABITATS (ESI = 3, 5)	
Habitat Description	Mixed sand and gravel habitats are characterized by a substrate that is composed predominantly of a mixture of sand- to cobble-sized sediments. These habitats may vary from a well-sorted cobble layer overlying finer-grained (sand-sized) sediments to mixtures of sand, pebble, and cobble. Typically, well-sorted beaches are exposed to some wave or current action that separates and transports finer-grained sediments; however, the sediment distribution does not necessarily indicate the energy at a particular shoreline. On depositional beaches multiple berms can be formed at the different water levels generated during storms. In glaciated areas, the gravel component can include very large boulders. Natural replenishment rates are very slow for gravel, compared to sand. Mixed sand and gravel habitats occur as beaches along the Great Lakes and as point bars along rivers and streams.
Sensitivity	Mixed sand and gravel habitats have medium sensitivity to oil spills. Biological communities are very sparse because of sediment mobility, desiccation, and low organic matter. Most invertebrates living in this habitat are deep burrowers, such as some oligochaete worms and insect larvae. Characteristic insects are mayflies, stoneflies, caddisflies, and midges, although mayflies and stoneflies are scarce or absent where silt is present. The nearshore habitat is used by fish for spawning and protects fry and larvae. There are also limited numbers of birds and mammals. Viscous oils reaching these habitats may not penetrate into the sediments because the pore spaces between sediments are filled with sand. Therefore, deep oil penetration and long-term persistence are lower than on gravel substrates. However, oil can still occur at depths below those of annual reworking, particularly if the oil is deposited high on the beach out of the reach of normal wave activity or is rapidly buried. Erosion can be a concern when large quantities of sediment are physically removed. In more sheltered areas, asphalt pavements can form if heavy surface oil deposits are not removed. Once formed, these pavements are very stable and can persist for years.

Environmental impact from response methods for MIXED SAND and GRAVEL habitats (ESI = 3, 5).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Debris Removal	-	A	A	A
Flooding	A	A	A	C
Natural Recovery	A	A	B	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	-	A	A	B
Vacuum	-	B	B	B
Manual Oil Removal/Cleaning	D	B	A	A
Sediment Reworking	D	B	B	B
Mechanical Oil Removal	D	C	B	B
Shoreline Cleaning Agents	-	-	B	B
Nutrient Enrichment	-	B	B	C
In-Situ Burning	-	-	B	B
Solidifiers	-	-	B	-
High-Pressure, Cold-Water Flushing	C	C	C	C
Low-Pressure, Hot-Water Flushing	D	C	C	B
High-Pressure, Hot-Water Flushing	D	C	C	C
Steam Cleaning	-	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: MIXED SAND AND GRAVEL HABITATS	
Least Adverse Habitat Impact	*Debris Removal* • Degree of oiling that warrants debris removal and disposal depends on amount of use by humans and sensitive resources *Flooding* • Most effective when the oil is fluid and adheres loosely to the sediments • Use on heavy oils is likely to leave large amounts of residual oil in the environment *Natural Recovery* • Least impact for small spills, lighter oil types, and remote areas *Low-Pressure, Cold-Water Flushing* • Most effective when the oil is fluid and adheres loosely to the sediments • Excessive pressures can cause erosion • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats *Sorbents* • Overuse generates excess waste • Useful for recovering sheens, even for gasoline spills • Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
Some Adverse Habitat Impact	*Vacuum* • Early use of vacuum on pooled, liquid oil can prevent deeper penetration *Manual Oil Removal/Cleaning* • Gasoline tends to evaporate quickly; therefore manual cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits due to removing oil • Minimizes sediment removal and problems of erosion and waste disposal • Preferable when oil is mostly on the surface, not deeply penetrated or buried *Sediment Reworking* • Use to break up heavy surface oil or expose persistent subsurface oil deposits, particularly where sediment removal will cause erosion • Use where there is sufficient exposure to waves to rework the sediments into their original profile and distribution • Gasoline tends to evaporate quickly; therefore sediment reworking causes habitat disruption, worker safety concerns, and generates waste with no benefits due to removing oil *Mechanical Oil Removal* • Tends to remove large amounts of sediment with the oil • Applicable for heavier oil types, which are difficult to remove otherwise • Gasoline tends to evaporate quickly; therefore mechanical cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil *Shoreline Cleaning Agents* • May be only technique to remove viscous oils without removing sediment • Individual products vary in their toxicity and ability to recover the treated oil *Nutrient Enrichment* • Not applicable to gasoline spills because they rapidly evaporate • Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues • Most applicable as a secondary technique after gross oil removal • Concerns about nutrient overloading in poorly flushed areas *In-Situ Burning* • Can effectively remove pooled surface oil accumulations • Concerns about air pollution, physical nature of the residue, and thermal impact on biota • May have to dig trenches to accumulate oil in pools • Lighter oils will not remain on the sediment surface *Solidifiers* • Early use may prevent pooled oil from penetrating deeper • Not applicable to gasoline spills because they rapidly evaporate • May be useful in recovering sheens when deployed as booms and pillows • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil.

Probable Adverse Habitat Impact	*High-Pressure, Cold-Water Flushing* • High-pressure water jets will flush oiled sediments into nearshore habitats • Excessive pressures can cause erosion if large amounts of sand are present *Low-Pressure, Hot-Water Flushing* • Any organisms present will be affected by hot water • Use on gasoline spills may transport the oil to more sensitive habitats
Most Adverse Habitat Impact	*High-Pressure, Hot-Water Flushing* • Will flush oiled sand into nearshore zone and affect any organisms present *Steam Cleaning* • Highly intrusive technique; will kill any organisms present • Potential for released oil to penetrate deeper into the sediments
Insufficient Information	*Chemical Shoreline Pretreatment* • Need more information on available products, their effectiveness, and impact *Natural Microbe Seeding* • There is insufficient information on impact and effectiveness in freshwater habitats

GRAVEL HABITATS (ESI = 6A)

Habitat Description	Gravel habitats are characterized by a substrate that is composed predominantly of gravel-sized sediments. By definition, gravel includes sediments ranging in size from granules (greater than 2 millimeters) to boulders (greater than 256 millimeters). The sand fraction on the surface is usually less than ten percent, although the sand content can increase to 20 percent with depth. These sediments are highly permeable because there are few sand-sized sediments to fill the pore spaces between the individual gravel particles. Gravel substrates may also have low bearing capacity and, consequently, may not support vehicular traffic. Typically, well-sorted beaches are exposed to some wave or current action that reworks the sediments and removes the finer-grained sediments. However, the sediment distribution does not necessarily indicate the energy setting at a particular shoreline; sheltered beaches can still have a large gravel source. In glaciated areas, the gravel can include very large boulders. On depositional beaches, zones of pure pebbles or cobbles can form into multiple berms at the different water levels generated during storms. Gravel shorelines tend to be steeper than those composed of sand or mud. Natural replenishment rates are very slow for gravel compared to sand. Gravel habitats occur as beaches along the Great Lakes and as bars along rivers and streams.
Sensitivity	Gravel habitats have medium sensitivity to oil spills. Biological communities are very sparse because of sediment mobility, desiccation, and low organic matter. Characteristic insects are mayflies, stoneflies, caddisflies, and midges, all with larvae living among the sediments. Flatworms, leeches, and crustaceans may be found on the gravel undersides. The nearshore habitat is used by fish for spawning and provides protection for fry and larvae. Gravel habitats are ranked higher in sensitivity than sand and gravel habitats because deep penetration of stranded oil into the permeable substrate is likely. Oil can penetrate to depths below those of annual reworking, resulting in long-term persistence of the oil. The slow replenishment rate makes removing oiled gravel highly undesirable. Also, formation of persistent asphalt pavements is likely where there is high accumulation of persistent oils.

Environmental impact from response methods for GRAVEL habitats (ESI = 6A).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Debris Removal	-	A	A	A
Low-Pressure, Cold-Water Flushing	A	A	A	B
Flooding	A	A	A	C
Natural Recovery	A	A	B	B
Sorbents	-	A	A	B
Vacuum	-	B	B	B
High-Pressure, Cold-Water Flushing	C	B	B	B
Nutrient Enrichment	-	B	B	C
Manual Oil Removal/Cleaning	D	B	B	A
Sediment Reworking	D	B	B	B
Shoreline Cleaning Agents	-	-	B	B
In-Situ Burning	-	-	B	B
Solidifiers	-	-	B	-
Low-Pressure, Hot-Water Flushing	D	C	C	B
Mechanical Oil Removal	D	D	C	C
Steam Cleaning	-	D	D	D
Chemical Shoreline Pretreatment	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: GRAVEL HABITATS	
Least Adverse Habitat Impact	*Debris Removal* • Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources *Low-Pressure, Cold-Water Flushing* • Only effective when the oil is fluid and loosely adheres to the sediments • Usually used in conjunction with vacuum and sorbents • Use on heavy oils is likely to leave large amounts of residual oil in the environment *Flooding* • Only effective when the oil is fluid and adheres loosely to the sediments • Usually used with various flushing techniques • Use on heavy oils is likely to leave large amounts of residual oil in the environment *Natural Recovery* • Least impact for small spills, lighter oil types, remote areas, and eroding areas *Sorbents* • Overuse generates excess waste • Useful for recovering sheens, even for gasoline spills • Physical removal rates of heavy oils will be slow, so less oil will be mobilized for recovery by sorbents
Some Adverse Habitat Impact	*Vacuum* • Early use of vacuum on pooled, liquid oil can prevent deeper penetration *High-Pressure, Cold-Water Flushing* • High-pressure water jet is likely to flush finer sediments into nearshore submerged habitats • Very viscous oils will require extremely high pressure to mobilize them *Nutrient Enrichment* • Not applicable to gasoline spills because they rapidly evaporate • Concerns about nutrient overloading in poorly flushed areas or where nutrient toxicity, especially ammonia, might be significant • Potentially effective for lighter oils that leave thin residues; less effective for thick, weathered oil residues *Manual Oil Removal/Cleaning* • Gasoline tends to quickly evaporate; therefore manual cleanup causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil • Minimizes sediment removal and problems of erosion and waste disposal • Deep penetration of oil in porous gravel reduces effectiveness *Sediment Reworking* • Used where gravel removal is not feasible because of erosion concerns • Sufficient exposure to waves is required to rework the sediments into their original profile and distribution • Gasoline tends to evaporate quickly; therefore sediment reworking causes habitat disruption, worker safety concerns, and generates waste with no benefits from removing oil *Shoreline Cleaning Agents* • May be only technique to remove viscous oils without removing sediment or using hot-water flushing • Individual products vary in their toxicity and ability to recover the treated oil *In-Situ Burning* • Can effectively remove pooled surface oil accumulations • May have to dig trenches to accumulate oil in pools • Lighter oils will not remain on the sediment surface • Concerns about air pollution, physical nature of the residue, and thermal impact on biota *Solidifiers* • Early use may prevent pooled oil from penetrating deeper • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil • May be useful in recovering sheens when deployed as booms and pillows

Probable Adverse Habitat Impact	*Low-Pressure, Hot-Water Flushing* • May be needed to flush viscous or deeply penetrated oil • Any organisms present will be adversely affected by hot water *Mechanical Oil Removal* • Likely to remove large amounts of gravel with the oil • Foot and vehicular traffic on gravel could mix oil deeper into the sediments
Most Adverse Habitat Impact	*High-Pressure, Hot-Water Flushing* • High-pressure water jets are likely to flush oiled sediments into nearshore submerged habitats • Any organisms present will be adversely affected by hot water and high pressure *Steam Cleaning* • Highly intrusive technique; will kill any organisms present • Potential for released oil to penetrate deeper into the porous sediments
Insufficient Information	*Chemical Shoreline Pretreatment* • Need more information on available products, their effectiveness, and impact *Natural Microbe Seeding* • There is insufficient information on impact and effectiveness in freshwater habitats

VEGETATED SHORELINE HABITATS (ESI = 9A)

Habitat Description	Vegetated shoreline habitats consist of the non-wetland vegetated banks that are common features of river systems and lakes. Bank slopes may be gentle or steep, and the vegetation consists of grasses, bushes, or trees common to the adjacent terrestrial habitats. The substrate is not water-saturated and can range from clay to gravel. The banks may flood seasonally and are exposed to relatively high-energy removal processes, at least periodically. Along undeveloped shorelines, there can be leafy litter and woody debris trapped among the vegetation. In developed areas, yards and gardens may abut the lake or river.
Sensitivity	Vegetated shoreline habitats are considered to have medium to high sensitivity to oil spills. They are not particularly important habitats for sensitive animals and plants, although many animals use vegetated banks for drinking, washing food, crossing bodies of water, and feeding. Bank plants oiled during a flood period could be susceptible, especially if the flood rapidly subsides, allowing oil to penetrate into bank sediments and to contact root systems. Small plants, particularly annuals, are likely to be most damaged. Stranded oil could remain in the habitat until another flood reaches the same level and provides a mechanism for natural flushing. On steep banks, the oil is likely to form a band, or multiple bands, at the waterline. On gentle banks, there is a greater potential for oil to accumulate in pools, penetrate the substrate, and coat large areas of vegetation, thus raising the issue of shoreline cleanup. In developed urban and suburban areas, human use and aesthetics would be the main reasons for cleanup.

Environmental impact from response methods for VEGETATED SHORELINE habitats (ESI = 9A).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Natural Recovery	A	A	B	B
Flooding	B	A	A	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
Sorbents	-	A	B	B
Manual Oil Removal/Cleaning	D	B	B	B
Debris Removal	-	B	B	B
Vacuum	-	B	B	B
Vegetation Removal	D	B	B	B
Nutrient Enrichment	-	B	B	B
In-Situ Burning	-	B	B	B
High-Pressure, Cold-Water Flushing	D	C	C	D
Mechanical Oil Removal	D	C	C	C
Low-Pressure, Hot-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Sediment Reworking	D	D	D	D
Sorbents	-	B	B	B
Chemical Shoreline Pretreatment	-	I	I	I
Shoreline Cleaners	-	I	I	I
Natural Microbe Seeding	-	I	I	I

RESPONSE METHODS: VEGETATED SHORELINE HABITATS	
Least Adverse Habitat Impact	*Natural Recovery* • Low impact for small or moderate-size spills and lighter oils • More impact for large spills of medium- or high-viscosity oils *Flooding* • Operationally difficult and marginally effective for steep banks • Appropriate for gentle banks where persistent oil has pooled, assuming that the released oil can be directed towards recovery devices or sorbents • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats *Low-Pressure, Cold-Water Flushing* • Effective for washing oil stranded on the banks into the water for recovery • Vegetation cover minimizes the potential for sediment erosion from flushing • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats
Some Adverse Habitat Impact	*Sorbents* • Useful for recovering sheens, even for gasoline spills • Physical removal rates of medium and heavy oils will be slow, so less oil will be mobilized for recovery by sorbents • Overuse generates excess waste *Manual Oil Removal/Cleaning* • Some mixing of oil into the substrate and trampling of vegetation is unavoidable with foot traffic in oiled areas • Gasoline tends to quickly evaporate; therefore habitat disruption, worker safety concerns, and waste generated by manual cleanup are not balanced by benefits in removing oil *Debris Removal* • Degree of oiling that warrants debris removal and disposal depends on use by humans and sensitive resources • Minimal concerns where substrate is firm or work is conducted from boats *Vacuum* • Potential damage where substrate will not support vehicular traffic • Most effective where access is good and substrate can support vehicles • Only useful when oil is pooled *Vegetation Removal* • Usually not necessary to reduce oil impact on vegetation • May be required in areas used by sensitive animals *Nutrient Enrichment* • Applicable where nutrients are a limiting factor for oil degradation • More effective after gross oil removal is completed • Not applicable to gasoline spills because they rapidly evaporate *In-Situ Burning* • May be the least physically damaging means of oil removal from the banks • Least impact for grassy areas versus banks covered with trees and shrubs
Probable Adverse Habitat Impact	*High-Pressure, Cold-Water Flushing* • High-pressure water spray will disturb plants and erode sediments • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats *Mechanical Oil Removal* • Excessive physical disruption likely from use of equipment

Most Adverse Habitat Impact	*Low-Pressure, Hot-Water Flushing* • Hot water could kill plants and potentially erode and degrade habitat *High-Pressure, Hot-Water Flushing* • Combination of high pressure and hot water poses high risk of sediment and vegetation loss *Sediment Reworking* • Will result in extensive habitat disruption *Solidifiers* • Not applicable to gasoline spills because they rapidly evaporate • Application of loose particulates may impede removal of oil mixed with, and adhered to, vegetation, litter, and debris • May be useful in recovering sheens when deployed as booms and pillows • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil or penetrate netting or fabric encasing the loose particulates
Insufficient Information	*Chemical Shoreline Pretreatment* • There is insufficient information on impact and effectiveness in freshwater vegetation *Shoreline Cleaning Agents* • More information needed on available products, their effectiveness, and impact of use on vegetated bank habitats • Individual products vary in their toxicity and ability to recover the treated oil *Natural Microbe Seeding* • There is insufficient information on impact and effectiveness in freshwater vegetated shorelines

MUD HABITATS (ESI = 9B)	
Habitat Description	Mud habitats are characterized by a substrate composed predominantly of silt and clay sediments, although they may be mixed with varying amounts of sand or gravel. The sediments are mostly water saturated and have low bearing strength. In general, mud shorelines have a low gradient, although some steep banks also may consist of mud. The mud habitats generally are low energy and sheltered from wave action and high currents. Adjacent nearshore areas are usually shallow with muddy sediments. These fine-grained habitats often are associated with wetland. Bare or sparsely vegetated mud substrates are rare along Great Lake shorelines. However, they commonly occur along river floodplains and lake bottoms, where they can be exposed during seasonal low water levels.
Sensitivity	Mud habitats are highly sensitive to oil spills and subsequent response activities. Shoreline sediments are likely to be rich in organic matter and support an abundance of infauna. Muddy habitats are important feeding grounds for birds and rearing areas for fish. Oil will not penetrate muddy sediments because of their low permeability and high water content, except through decaying root and stem holes or animal burrows. There can be high concentrations and pools of oil on the surface. Natural removal rates can be very slow, chronically exposing sensitive resources to the oil. The low bearing capacity of these shorelines means that response actions can easily leave long-lasting imprints, cause significant erosion, and mix the oil deeper into the sediments. When subsurface sediments are contaminated, oil will weather slowly and may persist for years. Response methods may be hampered by limited access, wide areas of shallow water, fringing vegetation, and soft substrate.

Environmental impact from response methods for MUD habitats (ESI= 9B).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Natural Recovery	A	A	A	B
Flooding	B	A	A	A
Sorbents	B	A	A	B
Debris Removal	-	B	B	B
Vacuum	-	C	B	B
In-Situ Burning	C	C	C	C
Low-Pressure, Cold-Water Flushing	D	C	C	C
Manual Oil Removal/Cleaning	D	D	C	C
Low-Pressure, Hot-Water Flushing	D	D	C	C
Solidifiers	D	D	C	-
Mechanical Oil Removal	D	D	D	D
High-Pressure, Cold-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Sediment Reworking	D	D	D	D
Shoreline Cleaning Agents	-	D	D	D
Natural Microbe Seeding	-	I	I	I
Nutrient Enrichment	-	I	I	I
Chemical Shoreline Pretreatment	I	I	I	I

RESPONSE METHODS: MUD HABITATS	
Least Adverse Habitat Impact	*Natural Recovery* • Least impact for small spills and lighter oils, to prevent disruptions associated with cleanup efforts • For large spills or heavy oils, expect long-term persistence in low-energy settings *Flooding* • Effective only for fresh, fluid oils • Local topography may limit the ability to control where the water and released oil flow and effectiveness of recovery • Use on gasoline spills may transport the oil to more sensitive habitats *Sorbents* • Useful as long as the oil is mobilized and recovered by the sorbent • Overuse generates excess waste • Careful placement and recovery is necessary to minimize substrate disruption
Some Adverse Habitat Impact	*Debris Removal* • Degree of oiling that warrants debris removal and disposal depends on use by sensitive resources • Extensive disruption of soft substrate likely *Vacuum* • Not applicable to gasoline spills because of safety concerns • Use to remove oil pooled on the surface • Avoid digging trenches to collect oil because they can introduce oil deeper into the sediment • Disruption of soft substrates can be limited by placing boards on the surface and controlling access routes
Probable Adverse Habitat Impact	*In-Situ Burning* • Heat may impact biological productivity of habitat, especially where there is no standing water to act as a heat sink on top of the mud *Low-Pressure, Cold-Water Flushing* • Mud is readily suspended if substrate is not firm • Not effective for higher-viscosity oils that will not move with low pressure • Local topography may limit the ability to control where the water and released oil flow and effectiveness of recovery • Use on gasoline spills may transport the oil to more sensitive habitats *Manual Oil Removal/Cleaning* • Use where persistent oil occurs in moderate to heavy amounts, or where sensitive resources must be protected • Response crews may trample soft substrates, mix oil deeper into the sediments, and contaminate clean areas *Low-Pressure, Hot-Water Flushing* • Physical and thermal impacts to habitat likely

Most Adverse Habitat Impact	*Solidifiers* • High likelihood of disruption and mixing of oil deeper into the substrate during application and retrieval • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil *Mechanical Oil Removal* • Soft substrate will not support vehicular traffic • Will probably cause extensive physical habitat disruption *High-Pressure, Cold-Water Flushing and High-Pressure, Hot-Water Flushing* • High-pressure water will cause extensive sediment suspension and erosion • Potential for burial of oiled sediments and transport of oil to adjacent areas *Sediment Reworking* • Will extensively disrupt physical habitat • Increases oil penetration, burial, and persistence *Shoreline Cleaning Agents* • Current products are designed for use with high-pressure flushing; since used with flushing, water pressure needs to be considered • Individual products vary in their toxicity and ability to recover the treated oil
Insufficient Information	*Natural Microbe Seeding and Nutrient Enrichment* • Not applicable to gasoline spills because they rapidly evaporate • There is insufficient information on impact and effectiveness in mud habitats *Chemical Shoreline Pretreatment* • There is insufficient information about direct toxicity of the products, disturbances resulting from application and retrieval, effectiveness, and net benefit

Huntsman
Port Neches Performance Products
Appendix E

WETLAND HABITATS (ESI = 10A, 10B)	
Habitat Description	Wetlands are characterized by water, unique soils that differ from adjacent upland areas, and vegetation adapted to wet conditions. Wetlands include a range of habitats such as marshes, bogs, bottomland hardwood forests, fens, playas, prairie potholes, and swamps. Substrate, vegetation, hydrology, seasonality, and biological use of inland wetlands are highly variable, making characterization difficult. The surfaces of wetlands usually have a low gradient and vegetated areas are typically at or under the water level. There can be distinct channels or drainages with flowing water, except at the exposed outer fringe; however, natural physical processes are minimal. Water levels may vary seasonally, and the wetland may be simply a zone of water-saturated soils during the dry season.
Sensitivity	Wetlands are highly sensitive to oil spills. The biological diversity in these habitats is significant and they provide critical habitat for many types of animals and plants. Oil spills affect both the habitat (vegetation and sediments) and the organisms that directly and indirectly rely on the habitat. Surprisingly little is known about oil impact on freshwater plants, although there are likely differences between robust perennials with substantial underground systems and cycles of winter die-back, and annuals that lack underground nutrient reserves. Detritus-based food webs are fundamentally important in wetlands; oil could possibly affect these by slowing decomposition rates of plant material. Wetlands support populations of fish, amphibians, reptiles, birds, and mammals, with many species reliant upon wetlands for their reproduction and early life stages when they are most sensitive to oil. Many endangered animals and plants occur only in wetlands, and spills in such areas would be of particular conservation concern. Migratory waterbirds depend heavily on wetlands as summer breeding locations, migration stopovers, and winter habitats. The threat of direct oiling of animals using the wetland often drives efforts to remove the oil. If oil and/or cleanup efforts causes a loss of the more sensitive plants or modifies the ecosystem structure, then feeding and breeding of dependent wildlife may be affected.

Environmental impact from response methods for WETLAND habitats (ESI = 10A, 10B).

The following categories are used to compare the relative environmental impact of each response method for the specific environment or habitat for each oil type, using the following definitions: A = May cause the least adverse habitat impact. B = May cause some adverse habitat impact. C = May cause significant adverse habitat impact. D = May cause the most adverse habitat impact. I = Insufficient Information - impact or effectiveness of the method could not be evaluated at this time. "-" = Not applicable for this oil type.

Response Method	*Gasoline Products*	*Diesel Products*	*Medium Oils*	*Heavy Oils*
Natural Recovery	A	A	A	B
Sorbents	C	A	A	A
Flooding	B	A	A	B
Low-Pressure, Cold-Water Flushing	B	A	A	B
In-Situ Burning	B	B	B	B
Vacuum	-	B	B	B
Debris Removal	-	B	B	B
Vegetation Removal	D	C	C	C
Manual Oil Removal/Cleaning	D	D	C	C
High-Pressure, Cold-Water Flushing	D	D	D	D
Low-Pressure, Hot-Water Flushing	D	D	D	D
High-Pressure, Hot-Water Flushing	D	D	D	D
Mechanical Oil Removal	D	D	D	D
Sediment Reworking	D	D	D	D
Solidifiers	D	D	D	-
Shoreline Cleaning Agents	-	I	I	I
Nutrient Enrichment	-	I	I	I
Natural Microbe Seeding	-	I	I	I
Chemical Shoreline Pretreatment	-	I	I	I

RESPONSE METHODS: WETLAND HABITATS	
Least Adverse Habitat Impact	*Natural Recovery* • Least impact for small to moderate spills and lighter oils; avoids damage often associated with cleanup activities • Some cleanup may be warranted where large numbers of animals are likely to become oiled during wetland use *Sorbents* • Care is necessary during placement and recovery to minimize disturbance of substrate and vegetation • Overuse generates excess waste *Flooding* • Erosion of substrate and vegetation may be a problem • Can be used selectively to remove localized heavy oiling • Can be difficult to direct water and oil flow towards recovery devices • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats *Low-Pressure, Cold-Water Flushing* • If water pressures are too high, the substrate and vegetation may be disturbed • Use on heavy oils is likely to leave large amounts of residual oil in the environment • Use on gasoline spills may transport the oil to more sensitive habitats
Some Adverse Habitat Impact	*In-Situ Burning* • May be one of the least physically damaging means of heavy oil removal • Presence of a water layer on marsh surface can protect roots • Time of year (vegetation growth stage) is important consideration • May be appropriate for gasoline spills trapped in ice *Vacuum* • Can be effective in removal of pooled oil from the marsh surface • Trampling of vegetation and substrate can be limited by placing boards on the surface and limiting traffic *Debris Removal* • The removal of heavily oiled and mobile debris may reduce the tracking of oil off-site and contamination of wildlife
Probable Adverse Habitat Impact	*Vegetation Removal* • Used to prevent oiling of sensitive animals using the wetland • Most appropriate for oils that form a thick, sticky coating on the vegetation, such as medium and heavy oils • May delay recovery of the vegetation due to both oil impact and physical destruction by cleanup crews • Trampling of vegetation may be reduced by controlling access routes, using boards placed on surface, or conducting operations from boats *Manual Oil Removal/Cleaning* • Used where persistent oil occurs in heavy amounts and where sensitive resources using the wetlands are likely to be oiled • Response crews may trample roots and mix oil deeper into the sediments
Most Adverse Habitat Impact	*High-Pressure, Cold-Water Flushing* • High-pressure spray will disrupt sediments, root systems, and animals *Low-Pressure, Hot-Water Flushing and High-Pressure, Hot-Water Flushing* • Hot water will likely kill the vegetation *Mechanical Oil Removal* • Using vehicles in soft substrate will probably cause extensive physical disruption • Can completely alter the marsh substrate, hydrology, and vegetation patterns for many years • Use in heavily oiled wetlands when all other techniques have failed and there is an overriding reason for oil removal *Sediment Reworking* • No benefit from mixing oil deeper into fine-grained and organic soils

	Solidifiers • Not applicable to gasoline spills because they rapidly evaporate • Use likely to increase adherence to vegetation and slow weathering/removal rates of residual oil • Not effective on heavy oils, which are too viscous to allow the product to mix into the oil
Insufficient Information	*Shoreline Cleaning Agents* • More information needed on available products, their effectiveness, and impact of use on vegetated bank habitats • Individual products vary in their toxicity and recoverability of the treated oil *Nutrient Enrichment and Natural Microbe Seeding* • Not applicable to gasoline spills because they rapidly evaporate • Concerns include eutrophication and acute toxicity, particularly from ammonia, because of shallow waters and low mixing rates • There is insufficient information on impact and effectiveness in wetlands *Chemical Shoreline Pretreatment* • There is insufficient information about product toxicity, disturbances resulting from application and retrieval, effectiveness, and net benefit

Texas General Land Office
Oil Spill Prevention and Response

Oiled Wildlife Response Information Guide

General Response

- Federal regulations prohibit handling of migratory birds.
- Untrained personnel should not attempt to rescue oiled wildlife because of the potential of serious, sometimes fatal zoonotic diseases (transmission of disease from animal to human.)
- Oiled animals can inflict serious injury to untrained personnel.
- Only personnel from state fish & game agencies and U.S. Fish & Wildlife Service, or properly trained and permitted rehabilitators designated by these agencies are allowed to capture oiled wildlife.
- Make appropriate notifications and await instruction from licensed personnel on how to deal with affected wildlife.
- Only personnel licensed by the State of Texas are allowed to handle oil wildlife.

Resources

TX General Land Office 24 Hour Oil Spill Notification
800-832-8224

Wildlife Rehab & Education
Sharon Schmalz, Certified Oiled Wildlife and Response Team Member
Federal License # PRT673173 • State License # SPH090-090 • LA License # R-09-30
Margaret Pickell, Certified Oiled Wildlife & Response Team Member
Upper and Lower Coast: Cell 281-731-8826 • Office 713-861-9453 • Pager 713-279-1417 • (b) (7)(F) [redacted]

Wildlife Response Services LLC
Rhonda Murgatroyd, Certified Oiled Wildlife & response Team Member
Federal License # SPRH039465, TX License # REH-0401-713, LA License # R-07-13
713-705-5897 • Pager 281-266-0054

UPPER COAST

Region 1 (Beaumont/Port Arthur)
Region 2 (LaPorte / Houston)

Texas Parks and Wildlife
281-842-8100 (24 hrs)

Texas Parks and Wildlife – Spills and Kills-Winston Denton
281-534-0138 • 281-842-8100 • 281-534-0130 (office)

U.S. Fish & Wildlife (pager for Ron Brinkley)
281-286-8282 • Pager 281-505-4754 • Cell 713-542-1873

LOWER COAST

Region 3 (Corpus Christi • Region 4 (Brownsville)
Region 5 (Pt. Lavaca)

Texas Parks and Wildlife
956-350-4490

Texas Parks and Wildlife - Spills and Kills
361-825-3246

U.S. Fish & Wildlife (*pager for Claire Lee*)
512-994-9005

Animal Rehabilitation Keep (ARK) – Port Aransas, TX
361-749-6793

Upper Coast of Texas

A T L A S

Oil Spill Prevention & Response

By
Information Systems/Geographic Information Systems Division
and
Oil Spill Prevention & Response Division
Texas General Land Office

In association with
Hazardous Materials Response & Assessment Division
National Oceanic & Atmospheric Administration

PREFACE

This Texas Oil Spill Planning and Response Atlas contains maps and associated data to be used in oil spill planning and response on the upper Texas coast (from the Texas-Louisiana border to the mouth of the Colorado Rriver). These maps are the combined results of recent mapping and data collection efforts by the Texas General Land Office (GLO) in cooperation with other parties. These efforts include the Habitat Priority Protection Area mapping project, Environmental Sensitivity Index (ESI) mapping project, the Texas Coastal Natural Resource Inventory (NRI), and other GIS-related data acquisition efforts. Some of these projects are summarized below.

This atlas has been created to aid spill responders in making planning and response judgments and has been designed to present relevant data without giving the responder too much information.

The GLO makes no representations or warranties regarding the accuracy or completeness of data or information in this atlas, which is designed solely for use in oil spill planning and response. Maps in this atlas are not suitable for navigation, and do not purport to accurately delinate boundaries between private and public land. The habitat priority protection area information and biological resource data are general and are not meant to replace onsite evaluation. The absence of resources or other map features on the response maps does not necessarily indicate that they are not present.

All data on the maps are stored in digital form in a Geographic Information System (GIS) maintained at the GLO. Some data are to be revised periodically by personnel in the GLO GIS Division. For further information, contact the GLO GIS Division at (512) 463-5257.

ACKNOWLEDGMENTS

Creation of this Atlas was supported jointly by the GLO Oil Spill Prevention and Response Division and the National Oceanic and Atmospheric Administration (NOAA) Hazardous Materials Response and Assessment Division. Project managers were Robert Martin, State Scientific Support Coordinator, and Lee A. Smith, Director of GIS, of the GLO and Robert Pavia, Chief of Scientific Support Coordination, of NOAA.

The documents and maps that form the basis of the habitat priority protection area layer were compiled by personnel with the Texas Parks and Wildlife Department (TPWD) Resource Protection Division led by Anne H. Walton. David R. Sager and Donald E. Pitts, Jr. of TPWD Resource Protection Division provided project oversight.

Biological resource data were collected as part of the Environmental Sensitivity Index (ESI) mapping project, involving a series of projects and workshops with leading experts on the Texas coast. Participants included personnel with the GLO,TPWD, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service, Texas A&M University-Galveston, and a number of other entities. ESI shoreline habitat classifications were mapped by Robert A. Morton and William A. White of the University of Texas Bureau of Economic Geology (BEG). David Bezanson and Sterling Harris of GLO GIS Division collected and assimilated the biological data used in the atlas. Lee A. Smith and Robert Martin managed both the ESI and the habitat priority protection area projects for the GLO. Additional support for ESI mapping projects in Texas is being provided by the U.S. Minerals Management Service (MMS) in conjunction with Louisiana State University's Center for Coastal Energy and Environmental Resources Program.

Under contract to NOAA, Research Planning, Inc.'s, (RPI) participation in the ESI mapping project included Jacqueline Michel, Miles O. Hayes and Jeffrey Dahlin as the project scientists, Joanne Halls as the project GIS manager, and E. Lee Dively, III who was responsible for data automation and organization. Field checking of the shoreline classification was conducted by Miles Hayes in conjunction with Robert Morton of the BEG. Dot Zaino prepared the ESI project documentation.

Some data in this atlas were collected as part of the Texas Coastal Natural Resource Inventory (NRI). Support for the NRI was provided by the Texas Natural Resource Inventory Trustees, which include the GLO, TPWD, and the Texas Natural Resource Conservation Commission.

Design and cartographic production of the atlas was conducted by David Bezanson, Ron Florence, Sterling Harris, Steven Marquardt, Lee A. Smith, and Marit Tenfjord of the GLO GIS Division. Publication preparation was provided be Leo S. Loza. Cover art was created by Alex Rodriguez of the GLO Graphics Division.

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DATA AND MAP DISCLAIMER

Components of the "Habitat Priority Protection Area Layer," 'Environmental Sensitivity Index Layer," "Biological Resources Layer," and certain metadata resources were based primarily on aerial photography and satellite imagery and reflect only the perceived conditions at the instant of the imagery or photography, with limited ground truthing. In some areas, the land/water interface is heavily dependent on seasonal and long term tidal variations, and on weather conditions at the time of the photograph or image. The interpreted limits of inundation, and therefore the interpreted range of "tidal/mud flats," "marsh, wetland," "inundated areas," "intermittent water body" and "submerged aquatic vegetation" in the maps which follow, may therefore be subject to wide variation.

Use of the term "shoreline" herein does not refer to the boundary between public and private land, nor does it refer to the place tide waters intersect upland property. "Shoreline" as used herein refers to areas, described by polygons, along the Texas coast which include habitats listed in the "Environmental Sensitivity Index." Only the definitions and descriptions contained herein with regard to "Environmental Sensitivity Index" classifications should be ascribed to the listed shoreline habitats. "Riparian Zone" designations were made without benefit of scientific testing for tidal influence and should not be used to identify the limits of coastal public lands. "Spoil Deposits" indicated do not necessarily reflect the full extent of such features and should not be used as an indication of fast land, nor the demarcation between uplands and coastal public lands. Spoil deposits exist which may not be shown on these maps.

DESCRIPTION OF ATLAS DATA LAYERS

1. HABITAT PRIORITY PROTECTION AREA LAYER The habitat priority protection area layer is intended to aid responders in establishing shoreline protection priorities. This information should be used in the initial stages of a spill when a responder needs guidance in setting protection priorities for sensitive areas prior to the arrival of local biological experts. Once on scene, local experts can use the maps as a starting point to be modified based on recent field observations and experience (for example, shifts in nesting locations or feeding areas which cannot be captured in a static map format). The data also provide a source of information for making area and facility contingency plans.

A simple ranking scheme (high, medium, low) is used to prioritize areas for protection from oil. An additional category, caution area, describes areas where caution should be exercised in moving vessels and equipment due to presence of sensitive resources, such as seagrasses, or species such as Texas diamondback terrapin.

The GLO contracted with the Texas Parks and Wildlife Department (TPWD) to compile this data layer for four Texas bay systems. Information was collected in 1992 93 using a consensus approach among local experts attending a series of workshops. Results from the Sabine Lake and Galveston Bay area workshops are contained in this atlas. Participants in the workshops were selected for their expertise with the bay system in question, and included representatives from state and federal agencies, academia, industry, and environmental groups, as well as fishing guides and spill response personnel.

At the workshops, participants outlined the distribution of important coastal resources on U.S. Geological Survey (USGS) 7.5' topographic quadrangle maps. Priority ranking for natural areas was determined by consensus. To encourage efficient mapping and decision making, small groups were organized to address specific resource themes. These resource themes were: wetlands and submerged aquatic vegetation, birds and other higher vertebrates, oysters and clams, and nursery areas and fishing. Moderators for each group of experts guided the process, while recorders documented the discussions and decisions made by the experts.

Experts delineated habitats as polygonal areas on maps and assigned habitat quality designations based on quality of natural resources in the area, number of functions in the natural community (for example, a wetland area may also serve as a nursery, as habitat for endangered species, and be heavily used by other species) and the area's ability to contribute to restoration of similar habitats damaged by a spill. These quality values are given for each polygon, organized by quad, in the data supplement of this atlas. The separate resource topic maps were combined into a single summary map for each quadrangle.

Again using a consensus approach, habitat polygons were refined and priorities were assigned by a committee of oil spill experienced biologists following the guidance provided by the workshop participants. In this process, habitat quality designations were reduced to the three habitat priority rankings (high, medium, and low) and one special category (caution area). The committee assigned these rankings based upon (1) uniqueness of resources, (2) the number of resources present, and (3) the quality of the resources. Rare, threatened or endangered species received high priority. Multifunctional systems (such as prime wetlands that are also year round bird habitat and nursery areas) received higher priority than prime areas for only one resource. Though natural resources are present throughout the bay system, only priority areas are shown.

The habitat priority rankings and caution areas are presented as the priority protection areas on the maps. A summary of habitat quality designations and other factors contributing to the priority rankings is provided in the data supplement.

The habitat priority protection area information is not intended to replace the input of the trustee agencies or other local experts during an oil spill. The guidance of local experts is necessary in order to obtain current and accurate information on coastal natural resources. Also, this layer does not include all natural resources or habitats present, but only priority areas. Accuracy of this data is general, to facilitate use of the information during a spill and because natural resources vary in location and abundance. The habitat priority information lack sufficient detail and accuracy for use as the basis of a complete natural resource damage assessment.

2. ENVIRONMENTAL SENSITIVITY INDEX LAYER As a part of the Environmental Sensitivity Index (ESI) Mapping Project supported jointly by the GLO and National Oceanic and Atmo spheric Administration (NOAA), intertidal habitats of the upper coast of Texas were mapped in 1993 94 and indexed according to rela tive sensitivity to oil. Where appropriate, multiple habitats were delin eated for each shoreline segment. This mapping was conducted by coastal scientists with the University of Texas Bureau of Economic Geology (BEG) on USGS 7.5' topographic quadrangles using a combination of recent aerial photographs, low altitude color video surveys taken in 1992, and oblique color slides taken in 1992. The maps were then field checked during overflights and ground sta tions in June 1994 by coastal geologists from Research Planning, Inc. (RPI) and the BEG.

Prediction of the behavior and persistence of oil in intertidal habitats is based on an understanding of the dynamics of the coastal envi ronments, not just the substrate type and grain size. The vulnerabil ity of a particular intertidal habitat is an integration of the following factors:

1) Shoreline type (substrate, grain size, tidal elevation, origin)

2) Exposure to wave and tidal energy

3) Biological productivity and sensitivity

4) Ease of cleanup

Key to the sensitivity ranking is an understanding of the relation ships between physical processes, substrate, shoreline type, prod uct type, fate and effect, and sediment transport patterns. The intensity of energy expended upon a shoreline by wave action, tidal currents and river currents directly affects the persistence of stranded oil. The need for shoreline cleanup activities is determined in part by the speed of natural processes in removal of oil stranded on the shoreline.

The ESI ranks shoreline environments as to relative sensitivity to oil, potential biological injury and ease of cleanup. Generally speaking, areas exposed to high levels of physical energy (wave action and tidal currents) and low biological activity rank low on the scale, while sheltered areas with associated high biological activity have the highest ranking. The following shoreline habitats were delin eated for Texas, presented in order of increasing sensitivity to spilled oil:

1) Exposed walls and other solid structures made of concrete, wood, or metal
2A) Scarps and steep slopes in clay
2B) Wave-cut clay platforms
3A) Fine-grained sand beaches
3B) Scarps and steep slopes in sand
4) Coarse-grained sand beaches (not present in study area)
5) Mixed sand and gravel (shell) beaches
6A) Gravel (shell) beaches
6B) Exposed riprap structures
7) Exposed tidal flats
8A) Sheltered solid manmade structures
8B) Sheltered riprap structures
8C) Sheltered scarps
9) Sheltered tidal fats
10A) Salt and brackish water marshes
10B) Freshwater marshes (herbaceous vegetation)
10C) Freshwater swamps (woody vegetation)

Each of these shoreline types is described in pages iv xii in terms of physical description, predicted oil behavior, and response consid erations.

The BEG completed ESI mapping for the upper Texas coast from Sabine Pass to Brown Cedar Cut/Dressing Point. Four map pages in the Matagorda area which are outside the BEG's project area (Matagorda, Matagorda Southwest, Palacios Northeast, Palacios Southeast) include smaller scale ESI data published in 1992 in the Texas Water Commission's Coastal Region Spill Response Map Se ries. The legend on these map pages reflects the somewhat differ ent inventory scheme used by the Texas Water Commission. An initiative to map ESI and biological resources in the middle Texas coast area (Matagorda Bay to Corpus Christi Bay) has been ap proved and will be conducted in 1996 97 by the GLO and BEG with support from the U.S. Minerals Management Service and Louisiana State University.

3. BIOLOGICAL RESOURCES LAYER In 1994 95, the GLO compiled information denoting key biological resources that may be at risk in the event of an oil spill on the upper Texas coast. Spe cies were included either because of likelihood of impact by a spill or threatened or endangered status. Major categories of biological resources considered were mammals, birds, fish, reptiles/amphibi ans, shellfish and plants. Records of species incidence are based on conversations with field experts representing numerous entities, including the TPWD, GLO, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service, Texas A&M University Galveston, Houston Audubon Society, and others. Occurrences of certain fish and shellfish species are based on sampling data com piled by the TPWD Coastal Fisheries Division.

The biological resources layer also includes locations mapped in the Texas Natural Heritage Program (TNHP) database, which in cludes reported locations of rare, endangered and threatened spe cies and plant communities. The TNHP database, maintained by the TPWD, contains historical and recent records and may in some instances not indicate current presence of a species.

Spatial distribution of species is represented on the maps by icons. The number under each icon or group of icons, or resource at risk number (RARNUM), references the list of species records in the tab ular data supplement (organized by quad). Listing of a species indi cates the presence of a species in the area where the icon is placed; generally speaking, most species will be present in similar habitats throughout the quad (exceptions include some rarer spe cies, especially plants, mapped by the TNHP).

The twenty species icons used on the maps, color coded by group (mammals, birds, reptiles/amphibians, fish, shellfish, and plants), represent subgroups of species based on behavior and taxonomy. Subgroups of bird species include diving birds, gulls/terns, passe rine birds (which are unlikely to be impacted by a spill), pelagic birds, shorebirds, waterfowl, wading birds, and raptors. Mammal species include mustelids (mink and river otter) and dolphins. All fish are represented by a single icon. Shellfish are divided into crabs, shrimp, bivalves and gastropods. Reptile/amphibian sub groups are alligator, turtles, and other (including snakes, frogs and other small reptiles, and amphibians). Plant species are divided into two subgroups: submerged aquatic vegetation (SAV) and terrestrial (upland and emergent wetland) plants. Submerged aquatic vegeta tion includes both seagrasses (widgeon grass, shoal grass, turtle

grass) and freshwater SAV (such as alligatorweed, water celery, and naiads). Wetland plants include rooted emergent vegetation (cordgrass, rushes, cattails).

Colonial waterbird rookery areas are shaded on the maps with a purple vertical hatch pattern. Oyster reefs in Galveston Bay are shown as polygons with a blue shade pattern without icons or tabular data. This information was collected by biologists led by Eric Powell of Texas A&M University. Submerged aquatic vegetation areas classified by the USFWS National Wetlands Inventory are identified on the maps by use of a seagrass symbol. Other species occurrences are represented by icons only.

The absence of a species in the list does not necessarily imply that the species is not present at a given location. Many coastal species are so ubiquitous or abundant that they are not mapped (for example, gulls and black skimmer are only recorded where breeding populations have been counted), and other species are often indicated only by general category (such as waterfowl and wading birds). These species tend to populate similar habitats, and are only recorded individually where breeding or high concentration areas. Generally common species are recorded at certain locations to indicate the general characteristics of the site.

The tabular data supplement in this atlas contains lists of species found at each location and life history information for each species. The life history and seasonality information is general for each species, however, and does not necessarily indicate that the species breeds at a specific location or is present at a particular time. Many bird and fish species migrate and may not be present at a location throughout the year.

The data supplement lists the RARNUM of the location shown on the maps, followed by the names of recorded species. The third and fourth columns denote special status of a species, if any (e.g., endangered (E) or threatened (T) status as designated by either the state (S) or federal government (F). Some other species of special concern (SC) in Texas are also noted). The fifth column gives, for some records, estimated relative concentration of species at the location (HIGH or LOW). These estimates are subjective values based on either local expert opinions on relative species concentrations in the area or (for some records of fish and crustaceans) sampling data compiled by the TPWD Coastal Fisheries Division. Species in colonial waterbird rookery areas may have numeric concentration values denoting the number of nesting pairs of the species counted during 1992 bird counts.

The species seasonality is shown in the next twelve columns as present or absent for each month. If the species is present on the upper Texas coast during a month, an “X” is placed in the month column. An “X” does not necessarily mean the species is present or abundant at the location at a particular time (for example, many fish species migrate seasonally from inshore areas to nearshore areas). The last columns give life stage seasonality for the species in Texas. Again, this information is general for the species in southeast Texas and does not necessarily indicate that breeding occurs at the location. This information is summarized for most species in the lists on pages xiii – xvii. All biological data is subject to revision based on better information from local experts.

4. HUMAN USE LAYERS The human use features depicted on the maps include facilities such as marinas, boat launch sites and beach access points which could be affected by an oil spill or could provide access for response operations. Some of these features are represented on the maps by icons which are consistent with standard ESI/response mapping symbology. Where an icon could not be placed at the correct location of a feature, a leader line is drawn from the icon to the proper location. The following human use features are represented by icons:

Aquaculture Facilities Locations were mapped by the GLO GIS Division based on address information provided by the Texas Department of Agriculture Permitting Division.

Beach Access Points Selected locations were mapped by the GLO Resource Management Division in cooperation with coastal municipalities.

Boat Launch Sites Data are maintained by the Texas Parks and Wildlife Department and were given to the GLO as part of the Natural Resource Inventory Project.

U.S. Coast Guard Stations Mapped by the GLO GIS Division from information provided by the U.S. Coast Guard (USCG).

Heliports Locations were generated from coordinates provided by the Aviation Division of the Texas Department of Transportation.

Lighthouses Locations provided by the USCG.

Marinas Information about marinas is maintained by the TPWD. Verification and mapping were done by the GLO GIS Division.

Water Intakes Locations were mapped by the GLO GIS Division based on mylar maps and data housed at the Texas Natural Resource Conservation Commission (TNRCC). The tabular data supplement includes the permit owner and type of water right for each record.

Human use facility information is continually changing and subject to revision by GLO GIS Division personnel.

5. OTHER MAP DATA LAYERS Other base map and thematic data on the maps have been culled from a variety of sources by GLO GIS Division. Hydrography on the maps is primarily based on USFWS National Wetlands Inventory data (which defines inundated and wetland areas, e.g. water bodies, wetlands, mud flats, dunes) and USGS 1:24,000 Digital Line Graph hydrography (including streams and some polygonal features, such as water bodies). Hydrography in Jefferson and Orange counties is derived from digitized aerial photography contributed by the Jefferson County Appraisal District and Southeast Texas Regional Planning Council, respectively. Hydrography data has been modified by GLO personnel to reflect newer information sources, including digital orthophotos, National Aerial Photography and other photography. Wetland information is based on digital files of varying dates and was unavailable for one map page area (Beaumont East).

Highway and road networks, municipal boundaries, railroads, and county parks are extracted from the TxDOT digital County Map Series. Representations of airports and airstrips are taken from USGS 1:100,000 scale Digital Line Graphs.

Ship channels and the Gulf Intracoastal Waterway are from drawings provided by the U.S. Army Corps of Engineers and digitized by GLO Resource Management Division personnel. Anchorage areas and safety fairways were digitized from Minerals Management Service maps. Bird rookery areas are based on hardcopy maps created by the Texas Colonial Waterbird Society and digitized by GLO personnel. National wildlife refuge areas were provided in digital form by the USFWS Realty Division; state parks, coastal preserves and National Audubon Society preserves were digitized from GLO or TPWD documents.

Shoreline Habitat Descriptions

EXPOSED WALLS AND OTHER SOLID STRUCTURES MADE OF CONCRETE, WOOD, OR METAL ESI = 1

DESCRIPTION

- These structures are solid, man-made structures such as seawalls, groins, revetments, piers, and port facilities.
- Many structures are constructed of concrete, wood, or metal.
- Often there is no exposed beach at low water, but multiple habitats are indicated if present.
- They are built to protect the shore from erosion by waves, boat wakes, and currents, and thus are exposed to rapid natural removal processes.
- They are heavily utilized by the public for fishing.
- Attached animals and plants are sparse.

PREDICTED OIL BEHAVIOR

- Oil is often held offshore by waves reflecting off the steep structures.
- Any oil that is deposited is rapidly removed from exposed areas.
- The most resistant oil would remain as a patchy band at or above the high-tide line.

RESPONSE CONSIDERATIONS

- Cleanup is usually not required.
- Access can be difficult and dangerous.
- High-pressure water spraying may be required to:
  - remove persistent oil;
  - improve aesthetics; or
  - prevent leaching of oil from the structure.

SCARPS AND STEEP SLOPES IN CLAY ESI = 2A

DESCRIPTION

- These shoreline types are created by eroding bluffs that are cut by waves, thus they are steep and narrow.
- They may represent natural shoreline features, such as the high clay bluffs along east Trinity Bay, or form along dredge spoil deposits and the Intracoastal Waterway.
- The clay is usually hard-packed and stiff, with an irregular, cracked surface.
- Attached animals and plants are vary sparse.
- There can be accumulations of wood debris and wrack at the base of the scarp.

PREDICTED OIL BEHAVIOR

- Oil will not adhere to the clay surface because it is impermeable, wet, and steep.
- Oil can penetrate in intertidal sediments, if present.
- Persistence of oil is usually short-term, except in crevices.

RESPONSE CONSIDERATIONS

- Cleanup is usually not required.
- Access and trafficability are usually poor.
- Where the high-water area is accessible, it may be feasible to remove heavy oil accumulations and oiled debris.

WAVE-CUT CLAY PLATFORMS **ESI = 2B**

DESCRIPTION

- These shoreline types form by wave or boat wake erosion of muddy substrates along navigation channels, the Gulf shoreline, and bay shores.
- They are characterized by a narrow shelf or platform that can be flooded depending on water levels.
- There can be burrowing animals in the mud.
- They are of very limited extent along the upper coast of Texas, restricted to the vicinity of High Island, just west of Sabine Pass, and at Sargent Beach.

PREDICTED OIL BEHAVIOR

- Oil will not adhere to the wet clay surface, but could penetrate the burrows if present and dry.
- Persistence of oil is usually short-term, except in wave shadows or where the oil was deposited high above normal wave activity.

RESPONSE CONSIDERATIONS

- Cleanup is usually not required.
- Where the high-tide area is accessible, it may be feasible to manually remove heavy oil accumulations and oiled debris.
- The muddy substrate cannot support heavy equipment, and even foot traffic could disrupt the sediments and mix oil deeper.

FINE-GRAINED SAND BEACHES **ESI = 3A**

DESCRIPTION

- These beaches are generally flat and hard-packed; along the Gulf shore they are 50 - 100 meters wide, whereas along bay shores they are approximately 15 meters wide.
- Though they are predominately fine sand, there is often a small amount of shell or shell hash.
- There can be heavy accumulations of wrack present.
- They occur along most of the barrier islands and peninsulas on the Gulf shore, and are common along south Galveston Bay, East Bay, and large spoil islands of the Houston Ship Channel.
- They undergo gradual erosion / deposition cycles.
- They are heavily utilized by birds for nesting, foraging and loafing.
- Upper beach fauna include ghost crabs and amphipods; lower beach fauna can be dense, but are highly variable.

PREDICTED OIL BEHAVIOR

- Light oil accumulations will be deposited as oily swashes or bands along the upper intertidal zone.
- Heavy oil accumulations will cover the entire beach surface; oil will be lifted off the lower beach by the rising water.
- Maximum penetration of oil into fine-grained sand is about 10 cm.
- Burial of oiled layers by clean sand within the first few weeks after a spill typically will be less than 30 centimeters along the upper beach face.
- Organisms living in the beach may be killed by smothering or lethal oil concentrations in the interstitial water.
- Biological impacts include temporary declines in infaunal populations, which can also affect important shorebird foraging areas.

RESPONSE CONSIDERATIONS

- These beaches are among the easiest shoreline types to clean.
- Cleanup should concentrate on removing oil and oily debris from the upper swash zone once oil has come ashore.
- Activity through both oiled and dune areas should be severely limited, to prevent contamination of clean areas.
- Manual cleanup, rather then road graders and front-end loaders, is advised to minimize the volume of sand removed from the shore and requiring disposal.
- All efforts should focus on preventing the mixture of oil deeper into the sediments by vehicular and foot traffic.
- Mechanical reworking of lightly oiled sediments in the upper intertidal zone can be effective along the Gulf shore.

SCARPS AND STEEP SLOPES IN SAND ESI = 3B

DESCRIPTION

- This shoreline type occurs where sandy bluffs are undercut by waves and slump.
- They normally form along embankments of sandy dredge-spoil material.
- Some scarps are fronted by narrow beaches, if the erosion rate is moderate or episodic.
- Biological utilization by infauna and birds is low.

PREDICTED OIL BEHAVIOR

- Oil will concentrate at the high water line, with the potential for penetration up to 10 cm into the sandy sediments.
- There is little potential for burial except when a major slumping of the bluff occurs.
- Burial of oiled layers by clean sand within the first few weeks typically will be less than 30 centimeters along the upper beach face.

RESPONSE CONSIDERATIONS

- Cleanup should concentrate on the removal of oil from the upper swash zone after all oil has come ashore.
- Manual cleanup is advised to minimize the volume of sand removed from the shore and requiring disposal, and to reduce the risk of increasing slumping and bluff erosion.
- All efforts should focus on preventing the mixture of oil deeper into the sediments.

COARSE-GRAINED SAND BEACHES ESI = 4

- Not present on the upper Texas coast.

MIXED SAND AND GRAVEL (SHELL) BEACHES ESI = 5

DESCRIPTION

- These beaches have sediments composed of a mixture of sand and shell.
- They occur on the Bolivar Peninsula, between High Island and Sea Rim State Park, and along spoil islands in East and West Bays and Galveston Bay.
- There can be large-scale changes in the sediment distribution patterns along the Gulf shore depending upon season, because of the transport of the sand fraction offshore during storms.
- Because of sediment desiccation and mobility on exposed beaches, densities of animals and plants are lower than sand beaches.

PREDICTED OIL BEHAVIOR

- During small spills, oil will be deposited along and above the upper swash zone.
- Large spills will spread across the entire intertidal area.
- Oil penetration into shelly zones may be up to 50cm, however, in general, oil behavior is much like on a sand beach.
- Burial of oil may be deep at and above the high-water line, where oil tends to persist.
- Oil can be stranded in the coarse sediments on the lower part of the beach, particularly if the oil is weathered or emulsified.

RESPONSE CONSIDERATIONS

- Heavy accumulations of pooled oil from the upper beachface should be removed quickly to prevent penetration into the porous sediments.
- All oiled debris should be removed.
- Sediment removal should be limited as much as possible.
- Mechanical reworking of lightly oiled sediments from the upper intertidal zone can be effective along the Gulf shore.
- In-place tilling may be used to reach deeply buried oil layers in the middle intertidal zone on exposed beaches, as an alternative to sediment removal.

GRAVEL(SHELL) BEACHES **ESI = 6A**

DESCRIPTION

- Gravel beaches in Texas are composed almost entirely of shell.
- They can be very steep, with multiple wave-built berms forming the upper beach.
- Shell beaches are common in bays near oyster reefs and along spoil islands where the spoil is reworked by waves into steep shell berms.
- Along the Gulf shore, gravel (shell) beaches are found at Sargent Beach, San Luis Pass, and east of High Island.
- Because of sediment desiccation and mobility on exposed beaches, there are low densities of animals and plants.

PREDICTED OIL BEHAVIOR

- Deep penetration of stranded oil is likely on gravel beaches because of their very high permeability.
- On Gulf beaches, oil can be pushed over the high-water and storm berms, pooling and persisting above the normal zone of wave wash.
- Long-term persistence will be controlled by the depth of penetration versus the depth of routine reworking by waves.
- On the more sheltered bay shoreline, sheening and formation of asphalt pavements is likely where accumulations are heavy.

RESPONSE CONSIDERATIONS

- Heavy accumulations of pooled oil should be removed quickly from the upper beach.
- All oiled debris should be removed.
- Sediment removal should be limited as much as possible.
- Low-to high-pressure flushing can be used to float oil away from the sediments for recovery by skimmers or sorbents.
- Mechanical reworking of oiled sediments in the upper intertidal zone can be effective in areas regularly exposed to wave activity (as evidenced by storm berms).
- In-place tilling may be used to reach deeply buried oil layers in the middle intertidal zone on exposed beaches.

EXPOSED RIPRAP STRUCTURES **ESI = 6B**

DESCRIPTION

- Riprap structures are composed of cobble-to boulder-sized blocks of rock or concrete.
- Riprap structures are placed for shoreline protection and inlet stabilization.
- Attached biota on the riprap can be sparse.
- These structures are highly utilized for shore-based fishing.

PREDICTED OIL BEHAVIOR

- Deep penetration of oil between the boulders is likely.
- Oil adheres readily to the rough rock surfaces.
- If oil is left uncleaned, it may cause chronic leaching until the oil hardens.

RESPONSE CONSIDERATIONS

- When oil is fresh and liquid, high-pressure spraying and/or water flooding may be effective, making sure to recover all released oil.
- Heavy and weathered oils are more difficult to remove, requiring scrapping and/or hot-water spraying.
- It may be necessary to remove heavily oiled riprap and replace it.

EXPOSED TIDAL FLATS **ESI = 7**

DESCRIPTION

- Exposed tidal flats are composed primarily of sand and minor amounts of shell and mud.
- Flats on the Gulf shore can support vehicular and foot traffic, whereas those along bays are usually too soft.
- They are usually associated with another shoreline type on the landward side of the flat and are most commonly associated with tidal inlet systems.
- They can be submerged or exposed to air, depending on water level and wind speed and direction.
- Biological utilization can be very high, with large numbers of infauna, heavy use by birds for roosting and foraging, and use by foraging fish.
- They are also highly utilized for recreational fishing.

PREDICTED OIL BEHAVIOR

- Oil does not usually adhere to the surface of exposed tidal flats, but rather moves across the flat and accumulates at the high-tide line.
- Oil may be deposited on the flat if concentrations are heavy.
- Oil does not penetrate water-saturated sediments.
- Biological damage may be severe, primarily to infauna, reducing food sources for birds and other predators.

RESPONSE CONSIDERATIONS

- Currents and waves can be very effective in natural removal of the oil.
- Cleanup is very difficult (and possible only during low water levels).
- The use of heavy machinery should be restricted to prevent mixing of oil into the sediments.
- On exposed sand flats, oil will be removed naturally from the flat and deposited on the adjacent beaches where cleanup is more feasible.

SHELTERED SOLID MAN-MADE STRUCTURES **ESI = 8A**

DESCRIPTION

- These structures are solid man-made structures such as seawalls, groins, revetments, piers, and port facilities.
- Many structures are constructed of concrete, wood, or metal.
- Often there is no exposed beach at low water, but multiple habitats are indicated if present.
- Most of the structures in bays are designed to protect a single lot, thus their composition, design, and condition are highly variable.
- They can have high recreational use, particularly in public areas.
- Attached animal and plant life can be sparse.

PREDICTED OIL BEHAVIOR

- Oil will adhere readily to the rough surface, particularly along the high-water line, forming a distinct oil band.
- The lower intertidal zone usually stays wet (particularly if algae covered), preventing oil from adhering to the surface.

RESPONSE CONSIDERATIONS

- Cleanup is usually conducted for aesthetic reasons or to prevent leaching of oil.
- Low- to high-pressure spraying at ambient water temperatures is most effective when the oil is fresh.

SHELTERED RIPRAP STRUCTURES **ESI = 8B**

DESCRIPTION

- Riprap structures are composed of cobble- to boulder-sized blocks of rock or concrete.
- These structures include revetments, seawalls, piers, and docks constructed of impermeable materials such as concrete.
- They are found inside harbors and bays in highly developed areas, sheltered from direct exposure to waves.

PREDICTED OIL BEHAVIOR

- Deep penetration of oil between the boulders is likely.
- Oil adheres readily to the rough rock surfaces.
- If oil is left uncleaned, it may cause chronic leaching until the oil hardens.

RESPONSE CONSIDERATIONS

- High-pressure spraying may be required to remove oil for aesthetic reasons and to prevent leaching of oil from the structure.
- Cleanup crews should make sure to recover all released oil.

SHELTERED SCARPS **ESI = 8C**

DESCRIPTION

- Sheltered scarps can be composed of clay formed by dredge-spoil deposits in man-made waterways or steep slopes composed of either clay or sand and covered with terrestrial vegetation.
- There may be some fringing marsh along the water's edge.

PREDICTED OIL BEHAVIOR

- Oil will not adhere to the wet sediment surface, but could penetrate the burrows if present and dry.
- Stranded oil will persist because of low energy setting.

RESPONSE CONSIDERATIONS

- Where the high-water area is accessible, it may be feasible to manually remove heavy oil accumulations and oiled debris.
- The muddy substrate cannot support heavy equipment, and even foot traffic could disrupt the sediments and mix oil deeper.

FRESHWATER MARSHES (HERBACEOUS VEGETATION) ESI=10B

DESCRIPTION

- Freshwater marshes are grassy wetlands composed of freshwater vegetation.
- They occur upstream of brackish vegetation along major rivers and tributary bayous and creeks.
- Those along major channels are exposed to strong currents and boat wakes; inland areas are highly sheltered.
- The sediment substrate is seldom exposed since daily water level changes are low; greater changes in water levels result from floods and winds.
- Resident flora and fauna are abundant with numerous species, with high utilization by birds.
- Along the upper coastline of Texas, they are present on the Sabine River delta, along the Neches River, and inland of the Trinity River delta.

PREDICTED OIL BEHAVIOR

- Oil adheres readily to marsh vegetation.
- The band of coating will vary widely, depending upon the water level at the time oil slicks are in the vegetation. There may be multiple bands.
- Large slicks will persist through multiple water level changes and coat the entire stem from the high-water line to the base.
- If vegetation is thick, heavy oil coating will be restricted to the outer fringe, although lighter oils can penetrate to the limit of the marsh.

RESPONSE CONSIDERATIONS

- Under light oiling, the best practice is to let the area recover naturally.
- Heavy accumulations of pooled oil can be removed by vacuum, sorbents, or low-pressure flushing. During flushing, care must be taken to prevent transporting oil to sensitive areas down slope or along shore.
- Cleanup activities should be carefully supervised to avoid vegetation damage.
- Any cleanup activity *must not* mix the oil deeper into the sediments. Trampling of the roots must be minimized.
- Cutting of oiled vegetation should only be considered when other resources present are at great risk from leaving the oiled vegetation in place.

FRESHWATER SWAMPS (WOODY VEGETATION) ESI = 10C

DESCRIPTION

- Freshwater swamps consist of shrubs and hardwood forested wetlands (essentially flooded forests).
- They are common along major river valleys, such as the Sabine, Neches, Trinity, and San Jacinto.
- The sediments tend to be silty clay with large amounts of organic debris.
- They are seasonally flooded, though there are many low, permanently flooded areas.
- Resident flora and fauna are abundant with numerous species.

PREDICTED OIL BEHAVIOR

- Oil behavior depends on whether the swamp is flooded or not.
- During floods, most of the oil passes through the forest, coating the vegetation above the water line, which changes levels throughout the flood event.
- Woody vegetation is less sensitive than marshes to oil coating.
- Some oil can be trapped and pooled on the swamp floodplain as water levels drop.
- Penetration into the floodplain soils is usually limited because of high water levels, muddy composition, surface organic debris, and vegetation cover.
- Large amounts of oily debris can remain.
- During dry periods, terrestrial spills flow downhill and accumulate in depressions or reach water bodies.

RESPONSE CONSIDERATIONS

- Under light oiling, the best practice is to let the area recover naturally.
- Heavy accumulations of pooled oil can be removed by vacuum, manual removal, or low-pressure flushing. During flushing, care must be taken to prevent transporting oil to sensitive areas down slope or along shore.
- Under stagnant water conditions, herding of oil with water spray may be needed to push oil to collection areas.
- Oily debris can be removed where there is access.
- Any cleanup activity *must not* mix the oil deeper into the sediments. Trampling of the roots must be minimized.
- Cutting of oiled vegetation should only be considered when other resources present are at great risk from leaving the oiled vegetation in place.

SPECIES

MAMMALS

Species	Life Stage	Seasonality	Habitat
Bottlenose dolphin *Tursiops truncatus*	Present	All Year	Gulf, bays, channels, passes
Mink *Mustela vison*	Present	All Year	Marshes
River otter *Lutra canadensis*	Present	All Year	Freshwater, occasional in bays
Stennelid dolphins *Stenella sp.*	Present	All Year	Offshore, channels, passes

BIRDS

Species	Life Stage	Seasonality	Habitat
American avocet *Recurvirostra americana*	Adult Juvenile	Aug. Apr. Aug. Apr.	Beaches, flats, shallow water
American bittern *Botaurus lentiginosus*	Adult Juvenile	Aug. Mar. Aug. Mar.	Swamps, marshes
American coot *Fulica americana*	Adult Adult Breeder Juvenile	Sep. Apr. Feb. Apr. Sep. Apr.	Lakes, bays, marshes
American oyster catcher *Haemetopus palliatus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Aug. All Year May Aug. May Aug. May Aug. May Sep.	Beaches, flats, shallow water
American wigeon *Anas americana*	Adult Juvenile	Oct Apr. Oct Apr.	Marshes, ponds
Anhinga *Anhinga anhinga*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Aug.	Swamps, lakes
Attwater's greater prairie chicken *Tympanuchus cupido attwateri*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	On federal endangered list; local west of Galveston Bay in prairies
Bald eagle *Haliaeetus leucocephalus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Jan. Aug. All Year Jan. Aug. Jan. Aug. Jan. Aug. Feb. Sep.	Threatened in U.S.; rivers, reser voirs, swamps
Black rail *Laterallus jamaicensis*	Adult Juvenile	Sep. Apr. Sep. Apr.	Rare; marshes, ricefields
Black skimmer *Rynchops niger*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Sep All Year Apr. Sep. Apr. Sep. Apr. Sep. Apr. Sep.	Shallow open water, beaches, spoil islands
Black tern *Chlidonias niger*	Adult	Jul. Jun. Jul. Jun.	Marshes, open water
Black bellied plo ver *Pluvialis squatarola*	Adult Juvenile	Mar. Dec. Mar. Dec.	Beaches, flats
Black crowned night heron *Nycticorax nycticorax*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Marshes, shores, swamps
Black necked stilt *Himantopus mexicanus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Sep. All Year Apr. Sep. Apr. Sep. Apr. Sep. Apr. Sep.	Ricefields, marshes, flats; win ters mainly on lower coast
Bonaparte's gull *Larus philadelphia*	Adult Juvenile	Sep. Mar. Sep. Mar.	Bays, Gulf
Brown pelican *Pelecanus occidentalis*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Open water, shorelines, piers, spoil islands; on federal endan gered list
Bufflehead *Bucephala albeola*	Adult Juvenile	Sep. Mar. Sep. Mar.	Lakes, bays
Canada goose *Branta canadensis*	Adult Juvenile	Sep. Mar. Sep. Mar.	Marshes, lakes, fields, prairies
Canvasback *Aythya valisineria*	Adult Juvenile	Oct. Mar. Oct. Mar.	Lakes, shallower bays
Caspian tern *Sterna caspia*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Jun. All Year Mar. Jun. Mar. Jun. Mar. Jun. Mar. Jun.	Shallow open water, beaches, spoil islands; nests from Galveston Bay south
Cattle egret *Bubulcus ibis*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Jul. All Year Apr. Jul. Apr. Jul. Apr. Jul. Apr. Aug.	Pastures, marshes
Clapper rail *Rallus longirostris*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Aug. All Year Mar. Aug. Mar. Aug. Mar. Aug. Apr. Sep.	Tidally influenced marshes
Common golden eye *Bucephala clangula*	Adult Juvenile	Sep. Apr. Sep. Apr.	Deeper lakes, bays, Gulf
Common moorhen *Gallinula chloropus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Aug. All Year Mar. Aug. Mar. Aug. Mar. Aug. Apr. Sep.	Fresh or brackish marshes, swamps, ponds
Common snipe *Gallinago gallinago*	Adult Juvenile	Sep. Apr. Sep. Apr.	Marshes, wet fields, swamps

Species	Life Stage	Seasonality	Habitat
Double crested cormorant *Phalacrocorax auritus*	Adult Juvenile	Sep. Apr. Sep. Apr.	Open water, structures, shore lines
Dunlin *Calidris alpina*	Adult Juvenile	Sep. May Sep. May	Mud flats, shores
Eskimo curlew *Numenias borealis*	Adult Juvenile	Mar. May Mar. May	Extinct or very endangered mi grant, last seen ca. 1980
Forster's tern *Sterna fosteri*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Aug. All Year Mar. Aug. Apr. Aug. Apr. Aug. Mar. Sep.	Shallow open water, beaches; winters on lower coast
Fulvous tree duck *Dendrocygna bicolor*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Uncommon in winter; marshes, ponds
Gadwall *Anas strepera*	Adult Juvenile	Sep. Apr. Sep. Apr.	Ponds, marshes, bays
Glossy ibis *Plegadis falcinellus*	Adult Juvenile	All Year All Year	Rare; marshes, ricefields, swamps
Great blue heron *Ardea herodias*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Jun. All Year Feb. Jun. Feb. Jun. Feb. Jun. Mar. Jul.	Marshes, rivers, lakes, shores, vegetated spoil islands
Great egret *Casmerodius albus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Mar. Jul. All Year Mar. Jul. Mar. Jul. Mar. Jul. Apr. Aug.	Shallow water, marshes, flats, ricefields, vegetated spoil is lands
Greater scaup *Aythya marila*	Adult Juvenile	Nov. Mar. Nov. Mar.	Open water
Green backed heron *Butorides striatus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Lakes, rivers, swamps, trees
Gull billed tern *Gelochilidon nilotica*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Shallow open water, beaches
Herring gull *Larus argentatus*	Adult Juvenile	All Year All Year	Beaches, piers, dumps, open water
King rail *Rallus elegans*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Fresh and brackish marshes, ricefields
Laughing gull *Larus atricilla*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Beaches, piers, open water, spoil islands
Least bittern *Ixobrychus exilis*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year May Sep. All Year May Sep. May Sep. May Sep. May Sep.	Fresh and brackish marshes, swamps
Least sandpiper *Erolia minutilla*	Adult Juvenile	Sep. May Sep. May	Marshes, flats, shorelines
Least tern *Sterna albifrons*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	Mar. Sep. Apr. Sep. Mar. Sep. Apr. Sep. Apr. Sep. May Sep. May Sep.	Shallow open water, beaches, shell areas
Lesser scaup *Aythya affinis*	Adult Juvenile	Sep. Mar. Sep. Mar.	Lakes, ponds, bays
Little blue heron *Florida caerulea*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Jul. All Year Apr. Jul. Apr. Jul. Apr. Jul. May Aug.	Shallow water, marshes, tidal flats, swamps, ricefields
Long billed curlew *Numenius americanus*	Adult Juvenile	Sep. Apr. Sep. Apr.	Prairies, marshes, flats, shore lines
Long billed dow itcher *Limnodromus scolopaceus*	Adult Juvenile	Sep. Apr. Sep. Apr.	Margins, flats
Loons *Gavia sp.*	Adult Juvenile	Oct Apr. Oct Apr.	Lakes, bays
Magnificent frigate bird *Fregata magnificens*	Adult Juvenile	All Year Apr. Sep.	Occasional in winter; around is lands, rigs, piers
Mallard *Anas platyrhynchos*	Adult Juvenile	Oct Apr. Oct Apr.	Marshes, lakes, ponds
Mergansers	Adult Juvenile	Oct Apr. Oct Apr.	Lakes, ponds, bays
Migratory song birds	Present	Mar. Jun. and Aug. Nov.	Coastal woodlands, forests and swamps
Mottled duck *Anas fulrigula*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Jan. Aug. All Year Jan. Aug. Jan. Aug. Jan. Aug. Feb. Sep.	Marshes, ponds, lakes
Northern harrier *Circus cyaneus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. May Sep.	Marshes, fields

Species	Life Stage	Seasonality	Habitat
Olivaceous cormo rant *Phalacrocorax olivaceus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Jan. Jul. All Year Jan. Jul. Jan. Jul. Jan. Jul. Feb. Aug.	Open water, structures, shore lines
Osprey *Pandion haliaetus*	Adult Juvenile	All Year All Year	Coastal area, lakes, rivers; occa sional nesting
Peregrine falcon *Falco peregrinus*	Adult Juvenile	Sep. Apr. Sep. Apr.	Federally endangered; open country, beaches, marshes
Pied billed grebe *Podilymbus podiceps*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Marshes, ponds, lakes
Pintail *Anas acuta*	Adult Juvenile	Aug. Apr. Aug. Apr.	Marshes, bays, lakes
Piping plover *Charadrius melodus*	Adult Juvenile	Aug. May Aug. May	Beaches, algal flats, coastal ar ea; threatened in U.S.
Purple gallinule *Porphyrula martinica*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Freshwater swamps, ponds; un common in winter
Reddish egret *Egretta rufescens*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. Apr. Sep.	Shores, salt marshes, tidal flats, winters on lower coast
Redhead *Aythya americana*	Adult Juvenile	Oct Apr. Oct Apr.	Lakes, bays
Ring billed gull *Larus delawarensis*	Adult Juvenile	All Year All Year	Bays, Gulf, piers, dumps
Ring necked duck *Aythya collaris*	Adult Juvenile	Oct. Mar. Oct. Mar.	Lakes, ponds, rivers
Roseate spoonbill *Ajaia ajaja*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. May Sep.	Marshes, flats, shores
Royal tern *Thalasseus maximus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Shallow open water, beaches, winters on lower coast
Ruddy duck *Oxyura jamaicensis*	Adult Juvenile	Oct. Mar. Oct. Mar.	Lakes, bays, rivers
Ruddy turnstone *Areniria interpres*	Adult Juvenile	Sep. May Sep. May	Beaches, flats, fields
Sandhill crane *Grus canadensis*	Adult Juvenile	Sep. Apr. Sep. Apr.	Prairies, marshes
Sandpipers	Adult Juvenile	Aug. May Aug. May	Shorelines, tidal flats

Species	Life Stage	Seasonality	Habitat
Sandwich tern *Thalasseus andvicensis*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Shallow open water, beaches, spoil islands
Seaside sparrow *Ammospiza maritima*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Sep. All Year Mar. Sep. Mar. Sep. Mar. Sep. Mar. Sep.	Coastal marshes
Semipalmated sandpiper *Ereunetes pusllus*	Adult Juvenile	Sep. May Sep. May	Shorelines, flats
Short billed dow itcher *Limnodromus griseus*	Adult Juvenile	Sep. May Sep. May	Open water, shorelines, salt marsh
Shoveler *Spatula clypeata*	Adult Juvenile	Oct. Apr. Oct. Apr.	Marshes, lakes, bays
Snow goose *Chen hyperborea*	Adult Juvenile	Sep. Mar. Sep. Mar.	Lakes, fields, bays, prairies
Snowy egret *Leucophoyx thula*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Jul. All Year Apr. Jul. Apr. Jul. Apr. Jul. May Aug.	Shallow water, marshes, flats, shores
Snowy plover *Charadrius alexandrinus*	Adult Juvenile Nesting Laying Hatching Fledging	All Year All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Uncommon; beaches, flats
Sooty tern *Sterna fuscata*	Adult Juvenile	Feb. Oct. Feb. Oct.	Rare on upper coast; Gulf, beaches
Sora *Porzana carolina*	Adult Juvenile	All Year All Year	Fresh and brackish marshes
Swallow tailed kite *Elanoides forficatus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	Mar. Nov. Apr. Aug. Mar. Nov. Apr. Aug. Apr. Aug. Apr. Aug. Mar. Sep.	Uncommon, but maybe recover ing former range; riparian areas, swamps, coastal prairies
Tricolored heron *Egretta tricolor*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. May Sep.	Shallow water, marshes, flats, lakes, vegetated spoil islands
Virginia rail *Rallus limicola*	Adult Juvenile	Sep. May Sep. May	Ponds, fresh and salt marshes
Whimbrel *Numenius phaeopus*	Adult Juvenile	Aug. May Aug. May	Shores, flats, marshes
White ibis *Eudocimus albus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Jun. All Year Feb. Jun. Feb. Jun. Feb. Jun. Mar. Jul.	Marshes, ricefields, shores

Species	Life Stage	Seasonality	Habitat
White pelican *Pelecanus erythrorhynchos*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Open water, shorelines, spoil is lands
White faced ibis *Plegadis chihi*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Uncommon; marshes, ricefields
White fronted goose *Anser albifrons*	Adult Juvenile	Sep. Mar. Sep. Mar.	Marshes, prairies, fields, lakes
White tailed kite *Elanus leucurus*	Adult Juvenile	All Year All Year	Uncommon; prairies, marshes
Willet *Catoptrophorus semipalmatus*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Aug. All Year Apr. Aug. Apr. Aug. Apr. Aug. May Sep.	Salt prairies, shores
Wood duck *Aix sponsa*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Feb. Aug. All Year Feb. Aug. Feb. Aug. Feb. Aug. Mar. Sep.	Rivers, ponds, swamps
Wood stork *Mycteria americana*	Adult Juvenile	All Year All Year	Swamps, marshes; occasional breeding
Yellow crowned night heron *Nyctanassa violacea*	Adult Adult Breeder Juvenile Nesting Laying Hatching Fledging	All Year Apr. Sep. All Year Apr. Sep. Apr. Sep. Apr. Sep. Apr. Sep.	Marshes, waterways, woods
Yellowlegs *Tringa sp.*	Adult Juvenile	Aug. May Aug. May	Marshes, shores, mudflats
Yellow rail *Coturnicops noveboracensis*	Adult Juvenile	Sep. Mar. Sep. Mar.	Uncommon; brackish marsh, thickets

NOTE: Some species are recorded only by subgroup. Subgroups listed in the data are:

Diving Birds: Loons, grebes, pelicans and cormorants.

Gulls/Terns: Gulls, terns, black skimmer.

Migratory Songbirds: Many families of passerine birds: warblers, spar rows, etc.

Raptors: Hawks, merlin, kestrel, kites.

Shorebirds: May include sandpipers, plovers, sanderling, dowitchers, dun lin, red knot, willet, yellowlegs, ruddy turnstone, curlews, American avocet, whimbrel, or other species. Species vary somewhat according to habitat.

Wading Birds: Herons, egrets, rails, ibises, bitterns, roseate spoonbill, black necked stilt, and wood stork.

Waterfowl: May include ducks (wigeon, teals, gadwall, pintail, shoveler, scaups, mergansers, mottled duck, mallard, ring necked duck, wood duck, redhead, goldeneye, bufflehead, ruddy duck, canvasback), geese, American coot, and American moorhen. Species will vary according to habitat.

REPTILES

Species	Life Stage	Seasonality	Habitat
American alligator *Alligator mississippiensis*	Adult Juvenile Nesting Laying Hatching	All Year All Year Jun. Sep. Jun. Dec. Jul. Oct.	Marshes, swamps, rivers, estu aries
Diamondback ter rapin *Malaclemys terrapin*	Adult Juvenile Nesting Laying Hatching	All Year All Year Apr. May Apr. May May Jul.	Uncommon; estuaries, reefs, seagrass beds
Green sea turtle *Chelonia mydason*	Juvenile	All Year	Threatened in U.S.; occasional strandings on beach in summer
Hawksbill sea turtle *Eretmochelys imbricata*	Adult Juvenile	Apr. Oct. Apr. Oct.	Endangered; rare, deep water Coastal waters, beaches, reefs
Kemp's (Atlantic) ridley *Lepidochelys kempii*	Adult Juvenile	Mar. Nov. All Year	Endangered; shallow coastal waters, bays, passes
Leatherback sea turtle *Dermochelys coriacea*	Adult Juvenile	All Year All Year	Endangered; offshore Occasional in passes
Loggerhead sea turtle *Caretta caretta*	Adult Juvenile	All Year All Year	Threatened; offshore, passes Offshore, large bays

FISH

Species	Life Stage	Seasonality	Habitat
Atlantic croaker *Micropogonias undulatus*	Adult Spawning Larval Juvenile	All Year Nov. Mar. Apr. Oct. All Year	Bays, nearshore Shallow Gulf waters Shallow bays, nearshore Shallow bays, nearshore
Bay anchovy *Anchoa mitchilli*	Adult Spawning Larval Juvenile	All Year All Year All Year All Year	Bays, Gulf Bays, Gulf Bays, Gulf Bays, Gulf
Black drum *Pogonias cromis*	Adult Spawning Larval Juvenile	All Year Jan. Apr. Jul. Mar. All Year	Coastal bays Large primary bays Estuarine waters Estuarine waters
Blue catfish *Ictalurus furcatus*	Adult Juvenile	All Year All Year	Inland, occasional in bays
Channel catfish *Ictalurus punctatus*	Adult Juvenile	All Year All Year	Freshwater
Crevalle jack *Caranx hippos*	Present	All Year	Offshore, bays
Florida pompano *Trachinotus carolinus*	Adult Juvenile	All Year All Year	Gulf Gulf, bays in summer
Gafftopsail catfish *Bagre marinus*	Adult Spawning Larval Juvenile	All Year Mar Jul. May Aug. Jun. Sep.	Deeper channels, nearshore Shallow Gulf waters Inshore Bays, Gulf, deeper in winter
Gray snapper *Lutjanus griseus*	Present	All Year	Offshore, rare in bays
Gulf kingfish *Menticirrhus littoralis*	Present	All Year	Offshore
Gulf menhaden *Brevoortia patronus*	Adult Spawning Larval Juvenile	All Year Nov. Feb. Dec. Mar. Dec. Mar.	Bays, nearshore, offshore Offshore Upper bays Upper bays

Species	Life Stage	Seasonality	Habitat
Hardhead (sea) catfish *Arius felis*	Adult Spawning Larval Juvenile	All Year May Sep. Jun. Oct. All Year	Bays, nearshore Bays, nearshore Bays, nearshore Deeper waters in winter
Inland silverside *Menidia beryllina*	Adult Spawning Larval Juvenile	All Year May Sep. May Sep. All Year	Bays
Killifish *Fundulus sp.*	Adult Spawning Larval Juvenile	All Year Mar. Sep. Apr. Sep. All Year	Bays, margins Estuaries, esp. vegetated areas
Largemouth bass *Micropterus salmoides*	Adult Spawning Larval Juvenile	All Year Feb. Apr. Mar. May All Year	Freshwater rivers, lakes
Pinfish *Lagodon rhomboides*	Adult Spawning Larval Juvenile	All Year Mar. May Mar. May All Year	Bays, inlets, marshes, offshore Offshore Offshore, moving into bays Bays, esp. inlets, structures
Red drum *Sciaenops ocellatus*	Adult Spawning Larval Juvenile	All Year Aug. Nov. Sep. Dec. All Year	Bays, offshore in winter Gulf passes, nearshore Shallow bay waters Shallow bay waters
Sand seatrout *Cynoscion arenarius*	Adult Spawning Larval Juvenile	All Year Mar. Nov. Mar. Dec. All Year	Open bays, nearshore waters Gulf passes, nearshore Sand bottom areas Bays, sand bottom areas
Sheepshead *Archosargus proba tocephalus*	Adult Spawning Larval Juvenile	All Year Mar. May Apr. Aug. All Year	Bays, especially jetties Offshore Oyster reefs, grassbeds Shores, esp. jetties, bulkheads
Sheepshead min now *Cyprinodon variegata*	Adult Spawning Larval Juvenile	All Year Mar. Oct. Mar. Dec. All Year	Shorelines, shallow waters, grass flats
Silver perch *Bairdiella chrysoura*	Adult Spawning Larval Juvenile	All Year Apr. Oct. Apr. Oct.. All Year	Bays
Southern flounder *Paralichthys lethostigma*	Adult Spawning Larval Juvenile	All Year Sep. Dec. Oct. Dec. All Year	Bays, Gulf in winter Offshore Shallow estuarine waters Shallow estuarine waters
Southern kingfish (whiting) *Menticirrhus americanus*	Present	All Year	Offshore, bays
Spanish mackerel *Scomberomus maculatus*	Present	All Year	Offshore, bays in summer
Spot *Leiostomus xanthurus*	Adult Spawning Larval Juvenile	All Year Nov. Feb. Nov. Feb. All Year	Shallow bays, nearshore Nearshore Marshes, nearshore Shallow bays, seagrass beds
Spotted seatrout *Cynoscion nebulosus*	Adult Spawning Larval Juvenile	All Year All Year All Year All Year	Bays, nearshore waters Bays, especially in summer Seagrass beds, bays, marshes Bays, esp. seagrass flats
Striped mullet *Mugil cephalus*	Adult Spawning Larval Juvenile	All Year Nov. Feb. Dec. Feb. All Year	Coastal waters and Gulf Gulf Inlets, shallow waters, rivers Bays, rivers
Tarpon *Megalops atlanticus*	Adult Juvenile	All Year All Year	Offshore, uncommon in passes in summer
White crappie *Pomoxis annylaris*	Present	All Year	Freshwater, occasional in bays

SHELLFISH

Species	Life Stage	Seasonality	Habitat
American (eastern) oyster *Crassostrea virginica*	Adult Spawning Spat Juvenile	All Year Mar. Nov. Apr. Nov. All Year	Bays
Blue crab *Callinectes sapidus*	Adult Mating Hatching Larval Juvenile	All Year Apr. Jun. Apr. Jul. May Sep. All Year	Bays, nearshore Shallow bays, shorelines Shallow bay waters, shorelines
Brown shrimp *Penaeus aztecus*	Adult Spawning Egg/Larval Juvenile	Mar. Nov. Nov. Mar. Feb. Jun. Mar. Jul.	Offshore, bays, Gulf in winter Offshore Bays, shallow water areas Bays, shallow water areas
Common rangia *Rangia cuneata*	Present	All Year	Bays with freshwater inflows (Sabine Lake,Trinity Bay)
Grass shrimp *Palaemonetes pugio*	Adult Spawning Egg/Larval Juvenile	All Year All Year All Year All Year	Bays, shallow water areas
Lightning whelk *Busycon contrarium*	Present	All Year	Uncommon; bays
Northern quahog *Mercenaria mercenaria*	Present	All Year	Bays, esp. grass beds, occa sionally offshore
Stone crab *Menippe mercenaria*	Adult Mating Larval Juvenile	All Year May Sep. Jun. Sep. All Year	Shorelines, riprap, piers, reefs
White shrimp *Penaeus setiferus*	Adult Spawning Egg/Larval Juvenile	All Year May Oct. May Oct. All Year	Open bays Offshore Vegetated shallow bays, low salinity

NOTE: The general term "crustaceans" is used to mean all common Texas species, including blue crab, brown and white shrimp, etc.

METADATA

Airports
Sources: U.S. Geological Survey (USGS) Digital Line Graphs, Texas De partment of Transportation (TxDOT) files
Scale: 1:100,000
Accuracy: +/ 100 feet

Anchorage Areas
Source: Minerals Management Service (MMS)
Scale: N/A
Accuracy: N/A

Aquaculture Sites
Source: Texas General Land Office (GLO) from Texas Department of Agri culture information
Scale: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

Audubon Sanctuaries
Source: GLO documents
Scale: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

Bathymetry
Source: National Oceanic and Atmospheric Administration
Scales: 1:80,000 or better
Accuracy: +/ 75 feet

Beach Access Points
Sources: GLO (from Dune Protection and Beach Access Plans by Jeffer son County, City of Port Arthur, Chambers County, City of Galveston, City of Jamaica Beach, Brazoria County, Surfside Beach, Quintana Beach, Mat agorda County, City of Port Aransas, City of Corpus Christi, Nueces County, Kleberg County, Cameron County, and Town of South Padre Is land)
Scale of Source: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

Biological Resources
Source: GLO/Research Planning Inc.
Scale: N/A

Bird Rookery Areas
Source: GLO/Texas Colonial Waterbird Society
Scale: 1:24,000
Accuracy: +/ 40 feet

Boat Ramps
Source: Texas Parks and Wildlife Department (TPWD)
Scale: 1:40,000
Accuracy of Data: Variable

City and County Parks
Source: TxDOT digital county map series
Scale: 1:16,000 1:64,000
Accuracy: +/ 50 to 100 feet

City Limits
Source: TxDOT digital county map series
Scale: 1:16,000 1:64,000
Accuracy: +/ 50 to 100 feet

County Boundaries
Source: Texas Natural Resource Conservation Commission (TNRCC)
Scale: 1:24,000
Accuracy: +/ 40 feet

Environmental Sensitivity Index
Source: University of Texas Bureau of Economic Geology (BEG)
(from aerial photography, videography and GLO digital data)
Scale: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

Environmental Sensitivity Index - TNRCC
Source: TNRCC
Scale: Approximately 1:125,000
Accuracy: Not Available

Heliports
Source: TxDOT Aviation Division
Scale: N/A
Accuracy: N/A

Hydrography
Source: GLO (compiled from USGS Digital Line Graphs and hardcopy maps, U.S. Fish and Wildlife Service digital National Wetland Inventory, and digitized aerial photography from Jefferson County Appraisal District, Southeast Texas Regional Planning Council, and other sources)
Scale: 1:24,000 1:50,000
Accuracy: +/ 40 75 feet

Marinas
Source: GLO
Scale: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

National Wildlife Refuges
Source: U.S. Fish and Wildlife Service Realty Division
Scale: 1:24,000
Accuracy: +/ 40 feet

Oyster Reefs
Source: Eric Powell, Texas A&M University
Scale: 1:24,000
Accuracy: +/ 40 feet

Priority Protection Areas
Source: TPWD
Scale: 1:24,000
Accuracy: +/ 40 feet

Railroads
Source: TxDOT digital county map series
Scale: 1:16,000 1:64,000
Accuracy: +/ 50 100 feet

Roads/Highways
Source: TxDOT digital county map series
Scale: 1:16,000 1:64,000
Accuracy: +/ 50 feet

Ship Channels and Gulf Intracoastal Waterway
Source: U.S. Army Corps of Engineers engineering maps
Scale: Better than 1:24,000
Accuracy: Better than +/ 40 feet

State Coastal Preserves
Source: TPWD and TGLO documents
Scale: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

State Parks and Wildlife Management Areas
Source: TPWD and TGLO records, TxDOT county map series
Scale: Variable
Accuracy: Variable

Shipping Safety Fairways
Source: MMS
Scale: N/A
Accuracy: N/A

U.S. Coast Guard Facilities
Source: GLO (from U.S. Coast Guard information)
Scale: Approximately 1:24,000
Accuracy: Approximately +/ 40 feet

Washover Areas
Source: BEG
Scale: 1:24,000
Accuracy: Approximately +/ 40 feet

Water Intakes
Source: GLO (based on TNRCC hardcopy mylars)
Scale: 1:16,000 1:64,000
Accuracy: +/ 50 feet

Forms

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JCO Incident Report Database v1.6 — JCO19 Incident Report

Status:

Instructions: 1. Fill out all fields with a red asterisk under each tab under Section I.
2. You can save you work as a draft by clicking the "Close" button and clicking "Yes" when asked to save your changes.
3. Click the "Submit Incident Report" button only after all fields have been completely filled in. Once this button is clicked you will NOT have an opportunity to add or change content. Messages are sent to the Plant Manager and other Safety personnel.
4. Click the "Close & Save" button and save your changes.
5. When re-entering the Incident Report document after the first time (draft) please click the "Edit Document" button in order to finish filling in field information.

★ Indicates a required field

Supervisor's Report of Equipment Failure or Other Incidents Causing Deviation From Normal Operation

★ **Name of Person Reporting Incident:**

★ **Plant:**

Additional Persons Reviewing/Reporting Incident:

★ **Unit:**

★ **Plant Manager: (Manager's Name)**

★ **Date Report Submitted**

★ **Date Incident Begun:**

★ **Time Incident Begun:**

★ **Date Information Received:**

★ **Time Information Received**

★ **Weather Conditions:** ☐ Clouds >50% (overcast) ☐ Raining ☐ Dry ☐ Wet ☐ Fog

★ **Temperature** F

★ **Wind Speed/Direction:**

★ **Category of Incident** ☐ Community ☐ PSM/RMP ☐ Environmental ☐ Quality ☐ Near Miss ☐ Safety ☐ Other

★ **Probable Cause** ☐ Equipment Difficulty ☐ Procedures ☐ Human Performance Difficulty ☐ Training ☐ Maintenance Activity/Inactivity ☐ Other

★ **Impact or Potential Impact of Incident:**

☐ Contractor Injury	☐ Property Damage
☐ Evacuation	☐ Release to Air
☐ Explosion	☐ Release to Concrete
☐ Fire	☐ Release to Ground
☐ Minor Injury	☐ Release to Water
☐ Off-site Impact	☐ Runaway Reaction
☐ Off-Spec Product	☐ Serious Injury
☐ Other	☐ Shelter in Place
☐ Product Rework	☐ Smoke

★Chemicals & Equipment Involved	
★Incident (Describe briefly what happened)	
★All Facts surrounding incident (if chemical released, note chemical name, source, **hazard** type, estimated release duration)	
★Effects (Estimated Amount of Chemical Released, Production Time Lost, Equipment Damage, Personnel Injury, Offsite Impact, Etc.)	
Remarks (Actions already taken, if necessary, and/or additional comments)	

★**Shift Incident Occurred on:**	○ Day ○ Night
★ **Was this the regular shift for the personnel involved?**	○ Yes ○ No
★**Were any of the Personnel Involved in this Incident on Overtime?**	○ Yes ○ No
★**How many previous OT shifts worked prior to incident for each individual?**	
Comments	

Attachments:

Investigation "Next Step" Guide

★ To:		From:	
★ Subject	Incident Report Dated:	Approximate Replacement Cost:	
Involving Equipment		Check Appropriate Category:	

Please Select a Next Step below and provide necessary information:

★ Select Type Of Investigation:

☐ Plant Manager Review Required ☐ Investigative Report ☐ Root Cause Analysis

★ Plant

★ Unit

★ Date/Time of Occurrence

★ Date/Time Investigation Begun

★ Methodology Used to Analyze (Root Cause Analysis, Chronology, Etc.)

★ Incident

Incident Investigation Video Reviewed By Team ○ Yes ○ No

Date Time N/A

Plant Manager's Team Member Recommendations:

	Name	Expertise/Title	Area
Team Leader			
Health & Safety Committee Member			
Person Knowledgeable of Process			
Contractor Representative (If appl.)			
Safety Environmental/PSM Rep.			
Hourly Representative/Other			

★ Root Cause

Texas Commission on Environmental Quality - Air Section 3870 Eastex Fwy. Beaumont, Tx 77703-1892 Phone: (409) 898-3838	Completed Notification/ Report Submitted via:	e-mail	upset10@tceq.state.tx.us	Agency Use Only
Other Jurisdictions Also Notified (Local Programs)		Fax	(409) 892-2119	Inc.#
				Inv.#

Reportable Event/Activity Notification/Reporting Form

Submittal Type	Initial Notification		Final Report		Other Type and Purpose (describe)		

Name of Owner or Operator		Regulated Entity/Air Account Number	
Physical Location *(how to get to location of release)*			
Process Unit or Area Common Name			
Facility Common Name *(where air contaminants were generated)*		Emission Point Common Name *(where emissions were released to air)*	
Facility Identification Number (FIN)		Emission Point Number (EPN)	

This Event/	*Emissions Event*		*Sch. Maintenance*		*Sch. Startup*		*Sch. Shutdown*		*Excess Opacity Event*	

Date and Time Event Discovered or Scheduled Activity Start *(e.g., 9/12/02 @ 13:21)*							*Event Duration (hh:mm)*	
			@					
mm	*dd*	*yy*		*hh*	*mm*		*Hh*	*mm*

List of Compound Descriptive Type(s) of Individually Listed or Mixtures of Air Contaminant Compounds Released, Including opacity *(See the notification and reporting requirements under 30 TAC §§ 101.201 and 101.211 for detailed information related to how to report compounds and opacity. See also 30 TAC §101.1(84)).* Use attachments if necessary to report additional contaminants.	Estimated Total Quantity for Air Contaminants for Emissions/ Opacity Value for Opacity	*Units*	*Authorized Emissions/ Opacity Limit*	*Units*	*Authorization (rule or permit #)*
		lbs		Lb/hr	20485
		lbs		Lb/hr	20485
		lbs		Lb/hr	20485
		lbs		Lb/hr	20485
		lbs		Lb/hr	20485
		lbs		Lb/hr	20485

Cause of Emissions Event or Excess Opacity Event, or Reason for Scheduled Activity:

Actions Taken, or Being Taken, to Minimize Emissions And/or Correct the Situation:

Basis Used to Determine Quantities and Any Additional Information Necessary to Evaluate the Event:

ID: mmddyyLLLnn Event End Date & Time: mm/dd/yy hh:mm

Person Making Notification / Date and Time		Return Phone	
Company/Regulated Entity (RE) Contact		RE e-mail	

ns (Con't)

List of Compound Descriptive Type(s) of Individually Listed or Mixtures of Air Contaminant Compounds Released, Including opacity *(See the notification and reporting requirements under 30 TAC §§ 101.201 and 101.211 for detailed information related to how to report compounds and opacity. See also 30 TAC §101.1(84)).* Use attachments if necessary to report additional contaminants.	**Estimated Total Quantity for Air Contaminants for Emissions/ Opacity Value for Opacity**	***Units***	***Authorized Emissions/ Opacity Limit***	***Units***	***Authorization (rule or permit #)***
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	
		lbs		Lb/hr	

Person reporting spill/release to environmental: _____

Phone: _____

Date : Time (hrs):

Phone Numbers

Shift Team Leader **409-724-4833**

National Response Center (NRC) **1-800-424-8802** (for RQ spills/releases and oil spills)

EPA update to NRC reports **214-665-6493**

Texas Emergency Response Center **512-463-7727** (for all reportable spills after hours if local TNRCC is not available)

TCEQ - water / ground release **409-898-3838** (for all reportable spills)

US Coast Guard **409-723-6500** (for spills to public waters)

General Land Office - local **409-727-7481** (for oil spills off-plant - hazardous waste not included)

General Land Office - Austin **1-800-832-8224** (for oil spills off-plant - hazardous waste not included)

Jefferson County Emergency Management (LEPC) **409-722-4371** (for all RQ spills)

Jefferson County Sheriff's Office **409-835-8668** (for emergencies from RQ spills)

Wastewater Treatment Plant - O/O-C4-PO/MTBE **724-4808** (for potential upsets)

Wastewater Treatment Plant - Star **989-7302 or 989-7303** (for potential upsets)

Spill/Release Documentation Form

Material spilled / released: (ATTACH MSDS AND OTHER COMPOSITION DATA): _____
Amount spilled / released: _____ gal / bbl / lb/ ft3 Convert amount spilled/released to lbs: _____
Location of spill / release: (ATTACH SKETCH OF AFFECTED AREA AND SAMPLING POINTS) _____
Affected media: concrete / soil / air / wastewater treatment system / groundwater / offsite surface water/stormwater system / other
Address:: 2102 Spur 136, Port Neches, Texas 77651 **(409-724-4700)**

Person reporting spill/release to environmental: _____ Phone: _____
Date & Time: ___/___/___ ___:___am / pm
Start spill/release: ___/___/___ ___:___ am / pm Stop spill/release:___/___/___ ___:___am / pm
Discovered: ___/___/___ ___:___ am/pm Duration: _____
Cause of spill/release and description of incident: _____

_____

_____

Injuries, acute or chronic health risks: _____

Chemical Name	CAS No.	RQ (lbs)	Amount Spilled	*	Concentration	=	Amount of Chemical	RQ exceeded
				*		=		Yes / No
				*		=		Yes / No
				*		=		Yes / No
				*		=		Yes / No

Reportable for RQ: Yes / No
Reportable for occurring during transportation outside JCO fenceline: Yes / No
Reportable for entering surface waters outside JCO fenceline: Yes / No
Reportable for potentially entering groundwater: Yes / No
Reportable for potentially upsetting a wastewater treatment system: Yes / No
Reportable for potentially causing an odor problem: Yes / No

_____ Team Leader: **409-724-4833**
Name: _____ ___/___/___ ___:___ am / pm

_____ National Response Center (NRC) **1-800-424-8802** (for RQ spills/releases and oil spills)
Name: _____ ___/___/___ ___:___ am / pm
Report Number: _____

_____ EPA update to NRC reports **214-665-6493**
Name: _____ ___/___/___ ___:___ am / pm
Nature of update: _____

_____ Texas Emergency Response Center **512-463-7727** (for all reportable spills after hours if local TNRCC is not available)
Name: _____ ___/___/___ ___:___ am / pm

_____ TCEQ - water / ground release **409-898-3838** (for all reportable spills)
Name: _____ ___/___/___ ___:___ am / pm

_____ US Coast Guard **409-723-6500** (for spills to public waters)
Name: _____ ___/___/___ ___:___ am / pm

_____ General Land Office - local **409-727-7481** (for oil spills off-plant - hazardous waste not included)
Name: _____ ___/___/___ ___:___ am / pm

_____ General Land Office - Austin **1-800-832-8224** (for oil spills off-plant - hazardous waste not included)
Name: _____ ___/___/___ ___:___ am / pm

_____ Jefferson County Emergency Management (LEPC) **409-722-4371** (for all RQ spills)
Name: _____ ___/___/___ ___:___ am / pm

_____ Jefferson County Sherriff's Office **409-835-8668** (for emergencies from RQ spills)
Name: _____ ___/___/___ ___:___ am / pm

_____ TCEQ - air releases/odor problems **409-892-3523** (for unit upsets, air releases, odors)
Name: _____ ___/___/___ ___:___ am / pm _____

_____ Wastewater Treatment Plant - O/O-C4-PO/MTBE **724-4808** (for potential upsets)
Name: _____ ___/___/___ ___:___ am / pm

_____ Property Owner (for spills on another person's property) - must be made within 1 day of spill
Name: _____ ___/___/___ ___:___ am / pm Company: _____

Signature of person who made above notifications: _____ Date: _____

Spill/Release Documentation Form **Page 2**

Comments:

Spill/Release Documentation Form

Response actions taken to stop the spill/release*	**Start**/Stop		Effect of Weather/Comments
1. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____
2. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____

Response actions taken to contain spill/release*	**Start**/Stop		Effect of Weather/Comments
1. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____
2. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____

Response actions taken to remove spill/release*	**Start**/Stop		Effect of Weather/Comments
1. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____
2. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____

Amount of material recovered: _____ gal / bbl / lb / ft3 (ATTACH CALCULATIONS) Amount of soil removed: _____ yd3

Response actions taken to manage wastes*			Effect of weather/comments
1. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____
2. _____	___/___/___	____ **am / pm**	_____
_____	___/___/___	____ am / pm	_____

*Include names of all contractors, type of equipment used, etc.

Additional Actions Attached: Yes / No

Container type	Size	Number	Identification	Location	Manifest Number
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Additional Containers Attached: Yes / No

Work order numbers:

Waste sampled: Yes/No Date: ___/___/___ (ATTACH SAMPLE FORM) Sample Number: _____
(ATTACH RESULTS) Lab: _____ (ATTACH COC) Waste Code: _____

Cleaned up area sampled: Yes/No Date: ___/___/___ (ATTACH SAMPLE FORM) Sample Number: _____
(ATTACH RESULTS) Lab: _____ (ATTACH COC)

Background sampled: Yes/No Date: ___/___/___ (ATTACH SAMPLE FORM) Sample Number: _____
(ATTACH RESULTS) Lab: _____ (ATTACH COC)

Additional Samples Attached: Yes/No
Cleaned to background / RRS2 / RRS3 by visual inspection / sample results **(ATTACH DOCUMENTATION FOR RRS2 AND RRS3)**

All actions complete - Spill/Release report closed Name: _____ Date: _____

Initial Media Release Form

(Approved for use by Designated Spokesperson to handle media inquiries)

I am _____ representing
(name and title)
_____. At approximately _____
(company name) (time and date)
we had a (characterize incident) _____
(characterize incident)
_____

at _____. Cleanup and containment personnel have been dispatched to the site
(location)
and are working to bring the incident under control. (Note: If the incident is under control, say it is under control.) The cause of the incident has not yet been determined, and an investigation will be initiated as soon as practical. (Note: If you have confirmation of injuries, say "There are no injuries associated with the incident" (OR) "There have been _____ injuries and the injured are (being treated on-scene, en
(number)
route to _____ Hospital) at this time." DO NOT IDENTIFY INJURED.) At this time, our primary concern is for the safety and welfare of employees, personnel, the community, and the environment. Our number one objective is to contain and control this incident. That is all the information I have at this time. We will provide you updated information as it becomes available.

(Note: Do not speculate. If you do not know the answer to a question, say “I do not know.” Refer requests for additional information to the designated contact.)

Site Safety Assessment
(Page 1 of 3)

Applies to Site:

Date: | **Incident:**

Products: (Attach MSDS)

Site Characterization ☐ Marine vessel ☐ Pipeline ☐ Storage facility ☐ Truck/railcar ☐ Other _____

Water ☐ Shoreline ☐ Wetlands ☐ Other _____
☐ Rocky ☐ Sandy ☐ Muddy ☐ Other
☐ River ☐ Creek ☐ Canal ☐ Bay ☐ Ocean

Land ☐ Mountains ☐ Hills ☐ Brushland ☐ Forest ☐ Grassland
☐ Other _____

Use ☐ Public ☐ Government ☐ Residential ☐ Commercial
☐ Recreational ☐ Industrial ☐ Farmland ☐ Other

Weather ☐ Temp ___ °F ☐ Wind/dir. _____ mph ☐ Rain
☐ Snow ☐ Ice ☐ Other _____

Pathways for Dispersion ☐ Air ☐ Water ☐ Land ☐ Other ____

Site Hazards

☐ Chemical hazards
☐ Slips, trips, falls
☐ Heat stress
☐ Cold stress
☐ Weather
☐ Drowning
☐ Heavy equipment
☐ Drum handling
☐ Wildlife/plants
☐ Hand/power tools
☐ Lifting
☐ Boats
☐ Helicopters
☐ Noise
☐ Pumps, hoses
☐ Steam, hot water
☐ Fire/explosion
☐ Poor visibility
☐ Motor vehicles
☐ Confined spaces
☐ Ionizing radiation
☐ Other: _____

Air Monitoring

%LEL _____ %O2 _____ PPM Benzene _____ PPM H_2S _____

Other (specify) _____

Site Safety Assessment
(Page 2 of 3)

Control Measures

Engineering Controls

☐ Source of release secured ☐ Valve(s) closed ☐ Facility shut down

☐ Site secured ☐ Energy sources locked/tagged out

☐ Other _____

Personal Protective Equipment (PPE)

☐ PVC suits ☐ PE/TYVEK suits ☐ Respirator _____

☐ Nitrile gloves ☐ PVC gloves ☐ Other

☐ Rubber boots ☐ Hardhats ☐ Eye protection

Decontamination

Stations established

Sanitation

Facilities provided per OSHA 1910.120(n).

Illumination

Facilities provided per OSHA 1910.120(m).

Medical Surveillance

Will be provided per OSHA 1910.120(f).

Work Plan (Buddy system must be used.)

☐ Booming ☐ Skimming ☐ Vaccuum trucks ☐ Pumping ☐ Excavation

☐ Heavy equipment ☐ Sorbent pads ☐ Patching ☐ Hot work ☐ Shoring

☐ Appropriate permits issued

☐ Other (describe): _____

Training

Verified site workers trained per OSHA 1910.120.

Organization

Incident Commander: (D) _____ Radio/telephone: _____

(N) _____

Deputy IC: (D) _____ Radio/telephone: _____

(N) _____

Safety Officer: (D) _____ Radio/telephone: _____

(N) _____

Public Affairs Officer: _____ Radio/telephone: _____

Site Safety Assessment
(Page 3 of 3)

Emergency Plan

Alarm system: _____

_____

Evacuation plan: _____

_____

First aid locations: _____

_____

Notify the following as soon as possible:

- o Hospital: _____ Phone: _____
- o Ambulance: _____ Phone: _____
- o Air ambulance: _____ Phone: _____
- o Fire: _____ Phone: _____
- o Police: _____ Phone: _____

PRE-ENTRY BRIEFING:

- o Date/time completed: _____ By: _____
- o Hazards discussed (attach training documentation): _____
- o Other topics: _____

Date/Time Plan Completed: _____ By: _____

JEFFERSON COUNTY OPERATIONS

JOB SAFETY ANALYSIS

I. SCOPE

The purpose of this procedure is to establish guidelines and requirements for the development of Job Safety Analysis' (JSA's).

II. RESPONSIBILITIES

A. Team Leader shall:
- ♦ Ensure that JSA's have been prepared for tasks within their areas of responsibility that meet the JSA development priority as identified in Section IV.
- ♦ Ensure that the corrective measures identified in JSA's are functional
- ♦ Review and approve the final JSA indicating the job sequence and control measures are correct.
- ♦ Review and sign all JSA's in their areas
- ♦ Review the tasks in their area of responsibility and ensure that JSA's have been developed using the priority described in Section IV.
- ♦ Review and approve JSA's to ensure the proper procedure is being followed.
- ♦ Coordinate any Work orders generated as a result of a JSA.
- ♦ Ensure completed JSA's have been reviewed and documented by all affected employees.
- ♦ Ensure that all JSA's are kept current.

C. Associates, with the assistance of their Team Leader shall perform the JSA when required by this procedure. After completion of the JSA, the originator shall sign it.

D. The Safety Specialists from the Health and Safety Department shall review (with input from Industrial Hygienists where needed) and sign off on all JSA's prior to their implementation. H&S is also responsible for maintaining this procedure.

III. DEFINITIONS

Job Safety Analysis – A JSA is a method of:
- ♦ Identifying the basic steps of a job.
- ♦ Determining any existing or potential hazards associated with each step of a job.
- ♦ Developing recommendations for eliminating or controlling each hazard identified in the job.
- ♦ Identify the Industrial Hygiene hazards associated with the job.

- Determining the best way to perform the job to reduce or eliminate the hazards identified.

NOTE: JSA's may be included as a part of existing or new procedures such as Operating Procedures as long as:

1.) The procedure is specific to a task, not multiple tasks.
2.) All of the requirements in this procedure are met in regards to elements of a JSA, review and approval.

IV. PROCEDURE

A. Each Team Leader who directly supervises hourly associates in Operations, Maintenance and Laboratories shall have at least one (1) JSA prepared per quarter year. Additionally, JSA's may be prepared anytime a non-routine job is to be performed, as a result of a variance granted on a safety procedure or as a means of analyzing a job where an injury or near miss has occurred. The following should be used in determining the priority in generating JSA's in all areas:

   - Jobs with the highest rate of injury.
   - Jobs that have had "near misses".
   - Jobs that have high health hazard potential.
   - New jobs where changes have been made in the process.
   - Jobs that have been identified through an incident investigation as needing a JSA.
   - At the request of any employee. Employees may request a JSA be developed by contacting their Team Leader, contacting a representative of the H&S Department, contacting a Safety and Health Committee Member or submitting a Safety Concern form.

B. The job being evaluated for a JSA is prepared in draft by an associate familiar with performing JSA's. The draft will identify basic steps, determine any hazards associated with each step, and develop controls that are necessary to reduce potential hazards. If necessary, contact the location safety specialist or industrial hygienist to assist in determining proper controls. The completed JSA shall be reviewed with the associates' Team Leader.

C. The Team Leader and the associate shall both sign the JSA after review. Completed and signed JSA's shall be sent to the Safety Specialist with responsibility for the area in which the JSA is prepared.

D. The Safety Specialist, with input from an Industrial Hygienist when needed will review the JSA and include any additional health and safety information pertinent to the job being performed. If revisions are made, the JSA will be rerouted back to the originator for final changes. If no revisions are required the Safety Specialist shall sign the JSA and route it to the Team Leader of the area or department.

E. The Team Leader shall approve the JSA and return it to the Team Leader of the area for posting in the JSA manual.
F. The Responsible Team Leader will assure review and implementation by all affected employees.
G. All JSA's are to be reviewed annually, in response to an incident, or at the request of a Team Leader or associate.
H. JSA's will be revised when changes occur in procedures, control measures, or a change in exposure monitoring.

V. DOCUMENT REVIEW

This procedure will be reviewed every 5 years or as necessary.

VI. ATTACHMENTS

Job Safety Analysis Blank Form

VII. DOCUMENT OWNER – Health & Safety

JOB SAFETY ANALYSIS

Date: _____

JEFFERSON COUNTY OPERATIONS	JOB TITLE:	PREPARED BY SUPERVISOR:	PREPARED BY EMPLOYEE:
UNIT/ORGANIZATION:	LOCATION:	REVIEWED BY SAFETY:	APPROVED BY SUPT.:

INDIVIDUAL TASKS/STEPS INVOLVED	POTENTIAL HAZARDS	REQUIRED ACTION OR PROCEDURES

Weekly Hazardous/Non-Hazardous Waste Inspection
Huntsman Corporation - OO Plant

Location	Docks Landfill	Docks Across Ditch	Docks (Motiva Side)	E-A3-18	E-A3-22	E-A3-69	E-A3-36	E-A3-23	Tank Car Containment Area (A3)	Wash Oil Tk. Cont. Area (A3)	Wst. Water Coalescer Cont. Area (A3)
Waste Discription	Wst. Water Well RFI-I5D	Wst. Water Well RFI-23S	Wst. Water Well RFI-28D	Spent Methanol	Spent Methanol	Spent Methanol	Spent Methanol	Spent Methanol	T-O-88 Strainer Wst Mtl'	Used Wash Oil Filters	Heavy Oil/Tar/Water
Container	Drums	Drums	Drums	Drums	Drums	Drums	Drums	Drums	Drums	Drums	Drums
Facility Number	Satellite 181	Satellite 182	Satellite 183	Satellite 106	Satellite 107	Satellite 108	Satellite 109	Satellite 110	Satellite 115	Satellite 119	Satellite 125
Are there < 55 gallons of haz. wastes present?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								
Are contents of the container marked?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								
Is container marked haz. or non-haz.?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								
Is container closed when not in use?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								
Are containers in good condition?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								
Is containment in good condition and containment valve closed?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								
Are all containers free of leaks?	Yes X	Yes X	Yes X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	No	X	X	X	X	X	X	X	X
	NA	NA	NA								

Comments: Sattelite areas 106, 107, 108, 109, 110, 115, 119, 125 are not in service at this time.

INSPECTOR: _____ DATE: _____

PRINT _____ TIME: _____

	12/11/06	PLANT: P/O ROLL-OFF INVENTORY								
Location		Project/Unit	Box #	Date On Rent	Requested Date Off Rent	Waste Description	Wst.ID.No.	WO No.	TNRCC #	
IP	G. Kennedy	South of Main Reactors	99105	2/3/06	N/A	Filters	06-0012-PO	28308792-02	21213101	
IP	G. Kennedy	Thermon - CH	3466	N/A	N/A	Trash	06-0011-PO	28308791-02	21309992	
IP	G. Kennedy	Thermon - CH	1533	N/A	N/A	Trash	06-0011-PO	28308791-02	21309992	
S-5	R. Swiderski	E-F5-071A	VB-0027	9/18/06	10/23/06	Exchanger Residue	06-0013-PO	28335544-01		
Job	R. Simon	Re-Cat Change	1457	11/28/06		Trash	06-0011-PO	28346840-07		
Job	R. Simon	Re-Cat Change	3487	11/30/06		Trash	06-0011-PO	28346840-07		
Job	R. Simon	Re-Cat Change	3499	11/30/06		Trash	06-0011-PO	28346840-07		
Job	D. Allison	PO Laydown Yard	9873	12/14/06		Concrete	06-0011-PO	28337443-02		

12/11/2006

90 DAY-DRUM INVENTORY STORAGE LOG

Plant:O&O

Material Description	Unit Cont.#	Drum Qty	Drum Loc.	Date Accum.	Waste Description	Haz.	Non Haz.	UW	Wst ID #	WO #	HP-#	CP-#
E-7 Unit	D. Stagg	2	S-13	12/21/05	Sludge/Water		X		06-0084-E7	28088717-12	NC-27249	15073191
A-3 Unit	C. Bearden	1	S-8	4/3/06	Compressor Oil/Oil Dry		X		06-0112-A3	28087866-04	NC-7462	41364091
R&S	G. Ratcliff	1	S-11	4/11/06	Tank Solids (TK-22)		X		06-0118-R&S	28087859-04		
R&S	G. Ratcliff	8	S-15	4/11/06	Rust & Scale		X		06-0118-R&S	28291014-02		
R&S	G. Ratcliff	1	S-16	6/30/06	Frac Tank Rust/Scale		X		06-0118-R&S	28320177-02		
F-4 Unit		2	S-2	7/7/06	Carbonate Filters		X		06-0021-F4	28087720-07	NC-10183	20033101
F-4 Unit		2	S-10	7/27/06	Carbonate Filters		X		06-0021-F4	28087720-07	NC-10183	20033101
O/O Paint Yard	J. Higgins	4	S-6	8/15/06	Crushed Paint Cans		X		06-0059-O/O	28327230-04	NC-5780	41473081
F-4 Unit		1	S-10	8/25/06	Carbonate Filters		X		06-0021-F4	28087720-08	NC-10183	20033101
F-4 Unit		2	S-2	8/30/06	Carbonate Filters		X		06-0021-F4	28087720-08	NC-10183	20033101
O/O Paint Yard	J. Higgins	3	S-6	9/5/06	Crushed Paint Cans		X		06-0059-O/O	28327230-04	NC-5780	41473081
O/O Paint Yard	J. Higgins	3	S-6	9/11/06	Crushed Paint Cans		X		06-0059-O/O	28333024-02	NC-5780	41473081
O/O Paint Yard	J. Higgins	5	S-12	9/13/06	Blasting Grit (Box # 2518)		X		06-0003-O/O	28325298-01	NC-15438	41193892
A-3 Wash Slab	C. Bearden	4	S-8	9/29/06	Bundle Residue				06-0247-A3	28305849-01		
F-4 Unit		3	S-8	10/6/06	Carbonate Filters		X		06-0021-F4	28327809-01	NC-10183	20033101
E-3 Unit	G. Ratcliff	9	S-4	10/11/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
E-3 Unit	G. Ratcliff	12	S-5	10/11/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
E-3 Unit	G. Ratcliff	24	S-19	10/11/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
O/O Paint Yard	J. Higgins	1	S-7	10/12/06	Paint Solids			X	06-0009-O/O	28316624-01		
O/O Paint Yard	J. Higgins	1	S-7	10/12/06	Paint Liquid			X	06-0010-O/O	28316624-01		
O/O Paint Yard	J. Higgins	2	S-6	10/16/06	Crushed Paint Cans		X		06-0059-O/O	28333024-02	NC-5780	41473081
O/O Paint Yard	J. Higgins	4	S-6	10/16/06	Steel Blasting Grit		X		06-0246-O/O	28337486-03		
E-6 Unit	C. Cessna	1	S-12	10/18/06	Surfactant Slop		X		06-0005-E3	28339854-01	NC-14736	13094091
O/O Lab	B. Hurtado	1	S-6	10/19/06	Lab Pack-Amine Vials		X		06-0252-O/O	28325298-01		
O/O Lab	B. Hurtado	2	S-17	10/19/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
A-3 Unit	C. Bearden	2	S-14	10/20/06	Heater Coke		X		06-0006-A3	28087866-10		
A-3 Unit	C. Bearden	5	S-13	10/23/06	Lube Oil Cont. Rock		X					
E-3 Unit	G. Ratcliff	3	S-4	10/23/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
E-3 Unit	G. Ratcliff	3	S-15	10/23/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
O/O Lab	B. Hurtado	3	S-17	10/25/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
A-3 Unit	C. Bearden	1	S-14	10/26/06	Heater Coke		X		06-0006-A3	28087866010		
O/O Paint Yard	J. Higgins	2	S-7	10/31/06	Crushed Paint Cans		X		06-0059-O/O	28316624-01	NC-5780	41473081
O/O Lab	B. Hurtado	2	S-17	11/3/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	1	S-18	11/3/06	Syringes Containing Glycol/Amines/Surfactant		X		06-0018-O/O	28325298-01	CH97085	47062190
E-3 Unit	G. Ratcliff	6	S-11	11/6/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
E-3 Unit	G. Ratcliff	2	S-11	11/11/06	Spent Carbon/Soil	X			06-0251-E3	28339852-01		
O/O Lab	B. Hurtado	2	S-17	11/7/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Drumming Bldg.	B. Hurtado	1	S-3	11/7/06	204-TBA-Alcohol	X				28325298-01		
O/O Lab	B. Hurtado	1	S-18	11/7/06	Syringes Containing Glycol/Amines/Surfactant		X		06-0018-O/O	28325298-01	CH97085	47062190
F-4 Unit		3	S-2	11/9/06	Carbonate Filters		X		06-0021-F4	28340579	NC-10183	20033101
E-3 Unit	G. Ratcliff	1	S-16	11/9/06	Surfactant Slop		X		06-0005-E3			
O/O Lab	B. Hurtado	1	S-7	11/9/06	Oily Boom		X		Consolidation	28325298-01		
O/O Lab	B. Hurtado	2	S-17	11/10/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	1	S-17	11/15/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	2	S-17	11/22/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	1	S-18	11/22/06	Syringes Containing Glycol/Amines/Surfactant		X		06-0018-O/O	28325298-01	CH97085	47062190
A-3 Unit	C. Bearden	1	S-3	11/15/06	Tert Butyl Polysulfide/Water		X					
O/O Lab	B. Hurtado	2	S-17	11/27/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	1	S-17	11/30/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	1	S-18	11/29/06	Syringes Containing Glycol/Amines/Surfactant		X		06-0018-O/O	28325298-01	CH97085	47062190
O/O Lab	B. Hurtado	2	S-17	12/5/06	Lab Glass		X		06-0008-O/O	28325298-01	CH97085	47062190
A-3 Unit	C. Bearden	3	S-14	12/8/06	Heater Coke		X		06-0006-A3	28087866-10		
R&S	C. Bearden	2	S-9	12/7/06	Water Filters		X		Consolidation			

Dock Facility's Diesel Firewater Pump
Test & Inspection Checklist

- This checklist is a guideline for the test & inspection of the Dock's diesel firewater pump. It may be necessary to check the pump more frequently in some instances, such as if the pump is in operations for an extended period of time. The weekly test and inspection of this diesel pump is essential to ensure proper operation when needed. ***Refer to Section 2.2.10 in the Introduction Safety, Hygiene & Environmental Manual Document # 0201 for the proper procedure and explanation of each inspection item.***
- Testing & Inspection will be performed on Wednesday. The Tankerman and the Dockman are primarily responsible for performing this test & inspection, however if the Tankerman and/or Dockman are not assigned at the Dock then the RS&T Pumper will perform this test & inspection.

	Initial	
Engine Fuel System:	_____	Tank Level:_____inches
	_____	Any visible fuel leaks_____(Y/N)
	_____	Water in fuel system _____(Y/N)
	_____	Condition of hoses and connectors
Engine Lubrication System:	_____	Oil level (within range on dipstick)
	_____	Lube Oil Heater
Engine Exhaust System:	_____	Look for exhaust leaks and/or fire hazards
Engine Cooling System:	_____	Coolant Level
	_____	Condition of hoses and connectors
	_____	Adequate cooling water to heat exchanger
	_____	Jacket water heater (warm, not hot to the touch)
Engine Electrical System:	_____	General Visual Inspection
Engine Battery System:	_____	Electrolyte level
	_____	Terminals clean

Test-run the pump for (1) one hour. START TIME _____ STOP TIME _____

Comments: _____

_____

_____

Name: _____ Date: _____

Dock Facility's Diesel Firewater Pump
Test & Inspection Checklist
Additional Comments

HUNTSMAN

Date: 10-06
Inspector

HUNTSMAN CORPORATION
O&O
SAFTEY AND FIRE EQUIPMENT
INSPECTION LIST RECEIVING AND SHIPPING

ITEM	LOCATION	CONDITION
	R&S AREA A (HELPER) **(C-4 & C-9 TANK FARM)**	
Equipment		**OK**
SAFETY SHOWERS & EYE BATHS		
	WEST OF F-0-58	_____
	On walkway South of F-0-26	_____
	North of T-0-61	_____
	North of T-0-43 sump	_____
	EGME loading rack	_____
FIRE MONITOR & FOAM STATION	Caps in place& free. Yes	
	M-500-15 Southeast Of F-0-25	_____
	M-500-12A South of F-0-58	_____
	M-500-22/11 Northwest of F-0-58	_____
	M-500-5A Southwest of T-0-58	_____
	M-500-22/11 West of T-0-25	_____
FIRE HYDRANTS		
	H-500-16 South of T-0-25	_____
	H-500-7 Corner of B & 5TH. ST.	_____
DIKE VALVES	CLOSED / OPEN	
	T-0-25 Tank farm (2)	_____ _____ _____
	F-0-25 F-0-58 Tank farm	_____ _____ _____
FALL PROTECTION		
	EGME Loading rack	_____

HUNTSMAN

HUNTSMAN CORPORATION
O&O
SAFTEY AND FIRE EQUIPMENT
INSPECTION LIST RECEIVING AND SHIPPING

ITEM	LOCATION	CONDITION

R&S AREA A (HELPER)
(In & Around R&S Control Room)
(&satellite building)

FIRE MONITOR & FOAM STATION	Caps in place& free. Yes	OK
M-400-25 Northeast of control room	_____	_____
M-400-24 Northwest of control room	_____	_____

Refinery Grade Storage Tanks

SAFETY SHOWER & EYE BATH

South of refinery grade pumps		_____

FIRE HYDRANTS

H-400-33 South of refinery Grade propylene tanks.	_____	_____
H-400-30 West of storage Tanks on 5th. Street	_____	_____

DIKE VALVES	closed	open	
2 Open drains	_____	_____	_____
T-0-79 T-0-80	_____	_____	_____

Chemical Grade Propylene Tank
Farm & Tank Car Loading & Unloading

SAFETY SHOWERS & EYE BATH

On tank car rack	_____
West of F-0-65	_____
Southwest of F-0-64 across the street	_____

HUNTSMAN

HUNTSMAN CORPORATION
O&O
SAFTEY AND FIRE EQUIPMENT
INSPECTION LIST RECEIVING AND SHIPPING

ITEM	LOCATION	CONDITION
	R&S AREA A (HELPER) **Chemical Grade Propylene Tank** **Farm & Tank Loading & Unloading (cont'd)**	
FIRE MONITOR & FOAM STATION	Caps in place& free. Yes	OK
M-10-5 North of F-0-66	_____	_____
M-100-10 Northwest of tank car Rack on 6th street	_____	_____
M-100-10 West of F-0-65	_____	_____
M-100-19 South of pipeway	_____	_____
M-100-17 South of F-0-64	_____	_____
M-100-20 Southeast	_____	_____
FIRE HYDRANTS		
H-100-6 Corner of A & 5 ½ street	_____	_____
H-100-3 Corner of A & 6 th street	_____	_____
H-100-29 On 6 th street	_____	_____
FACE SHIELD		
#2 On tank car spot		_____
DIKE VALVES		
F-0-64 F-0-66 Tank Farm	_____ _____	_____
BRINE TANK FARM		
Northwest of T-0-122		

HUNTSMAN

HUNTSMAN CORPORATION
O&O
SAFTEY AND FIRE EQUIPMENT
INSPECTION LIST RECEIVING AND SHIPPING

ITEM	LOCATION	CONDITION

R&S AREA A (HELPER)
Drums in R & S Area

Product	is drum Labeled	number of drums	location
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

SAFETY CHAINS WITH STOP SIGNS	OK
Oxide loading North & South on 5th street	_____
Propane storage East & West on A street	_____
Propylene storage Northwest & Southeast	_____
R.G.P. storage East & West on A ½ street	_____
5 & A ½ street (East & West)	_____

R&S FIRE EXTINGUISHER CHECK SHEET

FIRE EXTINGUISHERS AREA A (HELPER)

LOCATION	ID	IN PLACE	SEALED	CURRENT PUNCH	CONDITION
WEST R&S BLD./POST TRACKMOBILE PRKG	A	YES / NO	YES / NO	YES / NO	
PROPYLENE STORAGE BULLETS/ W OF F-0-64	B	YES / NO	YES / NO	YES / NO	
PROPYLENE STG BULLETS/ HEAD OF STAIRS	C	YES / NO	YES / NO	YES / NO	
CGP STG BULLETS/ F-0-66 W. END/ 3RD DECK	E	YES / NO	YES / NO	YES / NO	
CGP STG BULLETS/ F-0-66 W. END/ 3RD DECK	F	YES / NO	YES / NO	YES / NO	
CGP STG BULLETS/ S. SIDE/ 3RD DECK	D	YES / NO	YES / NO	YES / NO	
CGP STG BULLETS P-0-158 BOOSTER	I	YES / NO	YES / NO	YES / NO	
SOUTH OF PROPYLENE LOADING PUMP	L	YES / NO	YES / NO	YES / NO	
CGP STG BULLETS F-0-66/ N.END/ 2ND DECK	G	YES / NO	YES / NO	YES / NO	
CGP STG BULLETS F-0-66/ W. END OF P-0-153	H	YES / NO	YES / NO	YES / NO	
CGP LDG RACK/ UNDER RACK/ ON I-BEAM	J	YES / NO	YES / NO	YES / NO	
CGP LOADING RACK/ HANDRAIL	K	YES / NO	YES / NO	YES / NO	
PROPANE STG BULLETS/ N. OF F-0-47	Q	YES / NO	YES / NO	YES / NO	
PROPANE STG BULLETS/ E, OF F-0-45	P	YES / NO	YES / NO	YES / NO	
PROPANE STG BULLETS/ N. OF F-0-49	O	YES / NO	YES / NO	YES / NO	
PROPANE STG BULLETS/ N. OF F-0-54	N	YES / NO	YES / NO	YES / NO	
CORNER OF A & 5TH STREET/ TRNSFMR POST	S	YES / NO	YES / NO	YES / NO	
R&S TRUCK #96048/ REAR COMPT./DVR SIDE	T	YES / NO	YES / NO	YES / NO	
NORTHEAST SIDE OF T-0-121	M	YES / NO	YES / NO	YES / NO	
VENT CONDENSATE RACK	R	YES / NO	YES / NO	YES / NO	
		YES / NO	YES / NO	YES / NO	
		YES / NO	YES / NO	YES / NO	
		YES / NO	YES / NO	YES / NO	

PUNCH TAG ON FIRE EXTINGUISHER FOR CURRENT MONTH
REPLACE FIRE EXTINGUISHER IF TAG OR SEAL IS MISSING!

INSPECTOR _____ DATE _____

UNIT SUPERVISOR _____ DATE _____

STFMN-0124

HUNTSMAN	SAFETY CHECK LIST FOR CAPS & PLUGS	HUNTSMAN

AREA A CONTROLMAN (GAUGER/PUMPER) TO CHECK FOR FOLLOWING ITEMS AT THESE LOCATIONS. (ANSWER YES OR NO.)

LOCATION	CAPS/PLUGS IN PLACE?	OPEN ENDED LINES?	LEAKING PUMP SEALS?	PACKING GLAND LEAKING ON VALVES?
1. PROPYLENE TANK CAR RACK				
2. PROPYLENE PUMP SLAB.				
3. PROPYLENE TANKS (F-O-64/65/66) & PIPEWAYS.				
4. #3 PUMP SLAB, DOCK LDG PUMPS, PIPEWAY & TANKFARM				
5. PYRONAPTHA PUMP SLAB.				
6. PROPANE PUMP SLAB. PROPANE PIPEWAY. PROPANE TANKS.				
7. #2 PUMP SLAB SOUTH OF R&S CONTROLROOM.				
8. C-4 TANKS, PUMP & PIPEWAY.				
9. ALL OF DOCK AREA				

Place a copy or the original of this form in the LDAR Coordinators mail box the same date as this inspection was completed. Also, complete a work request on any leaks found.

DATE:_____

CHECKED BY_____

#1 OPERATOR_____

Week Beginning Sunday, _____, 20_____

PO/MTBE UNIT ENVIRONMENTAL WALK-THROUGH CHECKLIST

DAILY INSPECTIONS – UTILITIES AREA
PROCESS LIQUID FUEL (PLF) TANK SYSTEM AND PIPING TO STEAM GENERATORS

	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY	
DATE														
OPERATOR														
ITEM	OK	Deficient	OK	Deficient	OK	Deficient	OK	Deficient	OK	Deficient	OK	Deficient	OK	Deficient
1. Are there any signs of corrosion or releases of waste in above ground portions of the PLF system (including tank, pumps, liner systems, piping, and instrumentation)?														
2. Are tank waste feed cut-offs in good working order?														
3. Are tank drainage systems working properly (no standing water)?														
4. Does data from monitoring and leak-detection equipment (pressure, level, and temperature gauges) indicate that tank system is operating according to design?														
5. Do the areas immediately outside the tank dike show any evidence of erosion or signs of releases (wet spots, dead vegetation, etc.)?														
6. Are hazardous waste labels complete and in place?														
7. Are all tank pump barrier fluid levels and pressures normal?														
8. Have the boilers and associated equipment (pumps, valves, pipes, fuel storage spheres, etc.) been visually inspected for leaks, spills, fugitive emissions, or signs of tampering?														

If any of the above are marked **"DEFICIENT"**, notify the Environmental Department and provide further comments below. Include information such as location, component identification (equipment number, tag number, etc.), description of findings, corrective action taken, who was notified and when, and any other pertinent information.

COMMENTS: _____

_____

_____

_____

Forward completed form to Environmental Department at 1J3

HUNTSMAN

R&S AREA C OPERATOR EQUIPMENT INSPECTION FORM

DATE: [redacted]

EQUIPMENT STATUS: R = RUNNING) = DOWN FOR MAINTENANCI S = SPARE

EQUIPMENT NUMBER	DAY	NIGHT	REMARKS	EQUIPMENT NUMBER	DAY	NIGHT	REMARKS
P-O-6			AFG LOADING	P-O-152B			Scrubber
P-O-12			DEG	P-O-86			CS Unloading
P-O-13			DEG	P-O-249			EO Circ Pump
P-O-159			EO	Seal Pot Press			
Seal Pot Press				P-O-141			Sperl Glycol
P-O-253A			Chiller Pump	P-O-247			Chiller Pump
Seal Pot Press				Seal Pot Press			
P-O-253B			Chiller Pump				
Seal Pot Press				P-O-122			RGP Propy
P-O-135			All Purpose	P-O-123			RGP Propy
P-O-139			EO Chrg to OSP	P-O-152A			Scrubber
Seal Pot Press				P-O-202B			
P-O-140			EO Chrg to OSP	Seal Pot Press			
Seal Pot Press							
P-O-173			EO to G Unit				
Seal Pot Press							
P-O-172			EO to G Unit	P-O-252A			CHILL WATER CIRC.
Seal Pot Press				P-O-252B			CHILL WATER CIRC.
P-O-147			EO to E Unit				
Seal Pot Press				EXCHANGER E-O-19			
P-O-148			EO to E Unit	INLET PRESSURE		OUTLET PRESSURE	
Seal Pot Press				EXCHANGER E-O-20			
P-O-150			Wash Oil Ldg	INLET PRESSURE		OUTLET PRESSURE	
P-O-197			EO Chrg to G1	EXCHANGER E-O-21			
Seal Pot Press				INLET PRESSURE		OUTLET PRESSURE	
P-O-145	OS	OS	EO Charge				
P-O-203A			A3 Charge				
P-O-203B			A3 Charge				
P-O-204			A3/LOU Chrg				
P-O-208A			Booster				
P-O-208B			Booster				
P-O-251A			Scrubber F-O-65				
Seal Pot Press							
P-O-251B			Scrubber F-O-65				
Seal Pot Press							

REMARKS CODES: 1. CONTAMINATED OIL 2. HIGH VIBRATIONS 3. ABNORMAL NOISE 4. ABNORMAL TEMP 5. OIL LEAKS 6. SEAL LEAKS 7. OIL MIST NOT VISIBLE 8. OTHER (STATE PROBLEM)

D-O-36	Inlet Pressure _____	Discharge Pressure _____	Delta P = (Inlet P-Discharge P)	_____
D-O-46A	Inlet Pressure _____	Discharge Pressure _____	Delta P = (Inlet P-Discharge P)	_____
D-O-46B	Inlet Pressure _____	Discharge Pressure _____	Delta P = (Inlet P-Discharge P)	_____

If the Delta P is greater than 10 pounds on any filter, contact your supervision so that a work request can be written and the filter can be safed for maintenance

Maintenance Coordinator to Initial and Date _____

OPEN DRAIN VALVE ON BEARING HOUSING TO INSPECT OIL. REPLACE BAD OIL TO CORRECT LEVEL WITH PROPER TYPE. REPORT ABNORMAL CONDITIONS OF EQUIPMENT USING THE ABOVE LISTED INSPECTION CODE. VISUALLY INSPECT OIL MIST LUBRICATION TO PUMPS. INSURE ALL PLUGS AND CAPS ARE IN PLACE.

NOTE: SEND COPY TO LDAR

REV 03/27/2006

#1 PUMP SLAB AREA A

LOADING	PUMPS	PLUG	CAP	PRODUCT	TAG #	SZE	COMMENTS
F-0-85	AREA			CYCLE EO WATER	NO TAG	¾"	CV-0-LV-6005
F-0-85				CYCLE EO WATER	NO TAG	¾"	0-FV-6008
F-0-85				CYCLE EO WATER	NO TAG	¾"	
F-0-85				CYCLE EO WATER	NO TAG	¾"	XV-6015
F-0-85				CYCLE EO WATER	NO TAG	¾"	
P-0-251B				CYCLE EO WATER	NO TAG	½"	SEAL POT
P-0-251B				CYCLE EO WATER	NO TAG	½"	SEAL POT
P-0-251B				CYCLE EO WATER	NO TAG	¾"	SEAL POT
P-0-251B				CYCLE EO WATER	NO TAG	¾"	SEAL POT
P-0-251B				CYCLE EO WATER	NO TAG	1"	SEAL POT
P-0-251B				CYCLE EO WATER	NO TAG	¾"	SUCTION PUMP
P-0-251B				CYCLE EO WATER	NO TAG	¾"	SUCTION PUMP
P-0-251B				CYCLE EO WATER	NO TAG	¾"	SUCTION PUMP
P-0-251B				CYCLE EO WATER	NO TAG	¾"	DISCHARGE OF
P-0-251B				CYCLE EO WATER	NO TAG	¾"	
P-0-251B				CYCLE EO WATER	NO TAG	¾"	
P-0-251B				CYCLE EO WATER	NO TAG	½"	
P-0-251A				CYCLE EO WATER	NO TAG	½"	SEAL POT
P-0-251A				CYCLE EO WATER	NO TAG	½"	SEAL POT
P-0-251A				CYCLE EO WATER	NO TAG	¾"	SEAL POT
P-0-251A				CYCLE EO WATER	NO TAG	¾"	SEAL POT
P-0-251A				CYCLE EO WATER	NO TAG	1"	SEAL POT
P-0-251A				CYCLE EO WATER	NO TAG	¾"	SUCTION PUMP
P-0-251A				CYCLE EO WATER	NO TAG	¾"	SUCTION PUMP
P-0-251A				CYCLE EO WATER	NO TAG	¾"	SUCTION PUMP
P-0-251A				CYCLE EO WATER	NO TAG	¾"	DICHARGE OF

EMERGENCY RESPONSE

Event: _____

Date: _____

Critique

Action Items

1. _____

_____

Assigned to: _____

Estimated Completion Date: _____

2. _____

_____

Assigned to: _____

Estimated Completion Date: _____

3. _____

_____

Assigned to: _____

Estimated Completion Date: _____

4. _____

_____

Assigned to: _____

Estimated Completion Date: _____

5. _____

_____

Assigned to: _____

Estimated Completion Date: _____

6. _____

_____

Assigned to: _____

Estimated Completion Date: _____

7. _____

_____

Assigned to: _____

Estimated Completion Date: _____

8. _____

_____

Assigned to: _____

Estimated Completion Date: _____

9. _____

_____

Assigned to: _____

Estimated Completion Date: _____

10. _____

_____

Assigned to: _____

Estimated Completion Date: _____

Approved and reviewed for distribution to the Facility Manager for review.

On Scene / Incident Commander
Date

Texas Petrochemicals
EMERGENCY RESPONSE

Event: _____

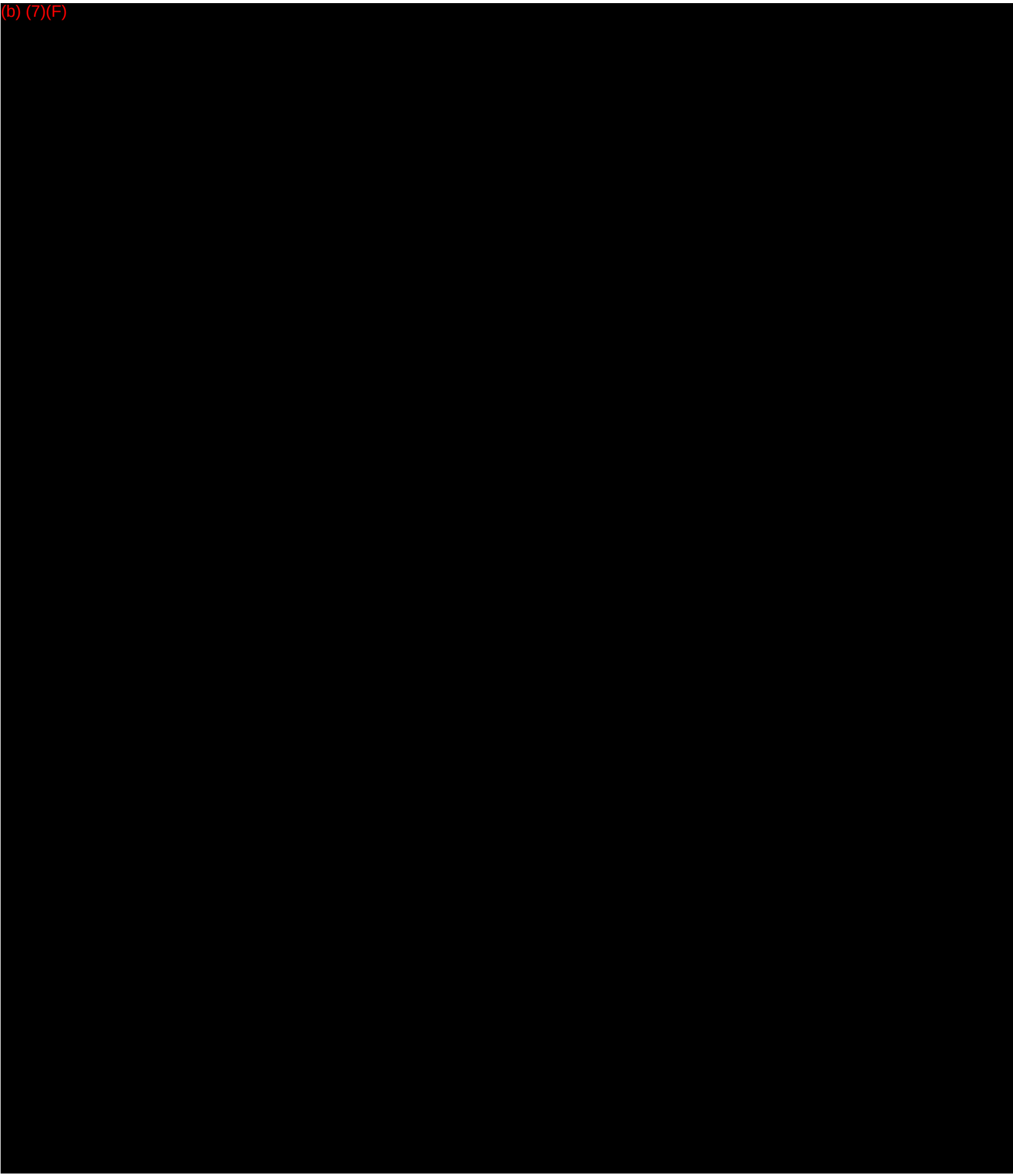
Date: _____

CRITIQUE SIGN IN SHEET

Annual Documentation Review Log

In-Field Verification and Review Dates			
In-Field Plan Review	**Inspections, Tests, and Procedures Being Conducted**	**Pollution Training Conducted**	**Signature**

(b) (7)(F)



Appendix G

The following Table is our guide to finding specific wildlife protection and oil pollution response strategies for oil spills from Huntsman PNPP

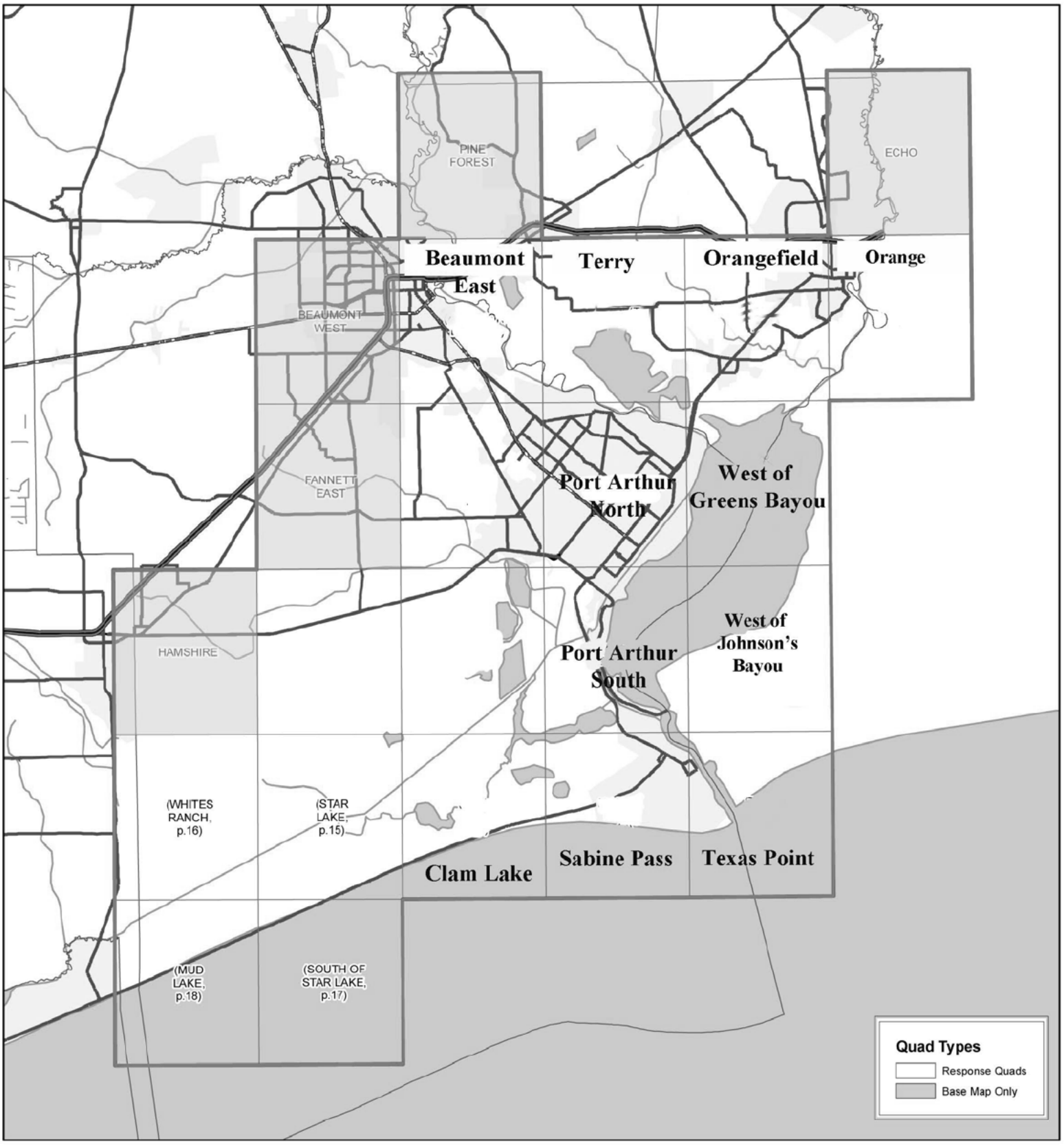
On the following page is a MAP with names in each block. These names are listed below. The names come from the USCG Port Arthur Area Contingency Plan. The names are your key to finding response strategies within that area of the Map. The page number for the detailed Sensitivity Map for that area is listed below as well as the page number of the priority for protecting resources in that particular area. Page numbers are also included to find a response map and site-specific response strategies and resource requirements. All resources required will be provided by our OSRO.

1. Predict path of oil from experience, NOAA Gnome model or other model.
2. Locate map on following page and then return to the chart below to identify the Sensitivity index map name.
3. Go to the Sensitivity Index and Review the protection priorities then go to the response area map and see the site specific response strategies and resources required.

Response Strategies Table

Map No. from ACP	Block Names from Map on following page	Sensitivity Index for the same Map	Protection Priorities within the same MAP	Response Areas for same map	Site Specific Response Resources and strategies
1	Orange	Page 6	Page 8	Page 50	Pages 61-77
2	Orangefield	Page 9	Page 11	Page 51	Pages 76 - 91
3	Terry	Page 12	Page 14	Page 52	Pages 92-103
4	Beaumont East	Page 15	Page 16	Page 53	Pages 104-129
5	West of Greens Bayou	Page 17	Page 28	Page 54	Pages 130-177
6	Port Arthur North	Page 21	Page 23	Page 55	Pages 178-195
8	West of Johnson's Bayou	Page 26	Page 28	Page 56	n/a outside area
9	Port Arthur South	Page 29	Page 32	Page 57	Pages 196-234
10	Big Hill Bayou	Page 33	Page 36	n/a outside area	n/a outside area
12	Texas Point	Page 37	Page 40	Page 58	n/a outside area
13	Sabine Pass	Page 41	Page 44		n/a outside area
14	Clam Lake	Page 45	Page 48		n/a outside area

Sabine Lake Area Index Map



1:450,000

0 2.5 5 10 15 Nautical Miles

0 2.5 5 10 15 Miles

0 2.5 5 10 15 Kilometers

OIL SPILL PREVENTION AND RESPONSE PROGRAM

Upper Coast of Texas

Oil Spill Planning and Response Atlas

Data Supplement

TEXAS
GENERAL LAND OFFICE
OIL SPILL
PREVENTION & RESPONSE

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
Hazardous Materials Response and Assessment Division

Published by the Texas General Land Office, October 1996.

Sabine Lake

Data Sheets

TEXAS
GENERAL LAND OFFICE
OIL SPILL
PREVENTION & RESPONSE

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
Hazardous Materials Response and Assessment Division

Site Specific Information
TGLO Response Atlas Map #1, Polygon #20,31;
Sabine River-Site #12



Site Information

Site 12 is the four primary cuts that feed into Pavell Island, which is located on the Texas side of the Sabine River. The point where the River flows around Pavell Island is referred to as Berwick Cut. The four inlets that lead into this Island need consideration. Pavell Island consists of intermediate marsh and is habitat for several sensitive species of flora and fauna. One large inlet is approximately ¾ of a mile down from the opening of Berwick Cut. The next two cuts are between the opening of Conway Bayou and the ICWW. One smaller cut is near Cutoff Island, LA. All of these cuts would need to be considered during a spill response. None of these cuts exceed 100 feet wide at a 45º angle.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Orange
Nearest ICW Marker:	N/A	**Date last visited:**	1/11/00

Access

Closest Boat Ramp:	Orange Boat Club
Distance:	15 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be located on the left hand side of the road just past the Adam's Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: **Medium**
Environmental: Birds, threatened raptors, intermediate marsh
Economic: Commercial traffic on ICWW

Safety / Cautionary Notes

There are submerged metal boat hulls that are not usually visible within Berwick Cut. Caution should be used when operating a boat in this area.

Booming Strategy Recommendations

Recommendations: Use a total of 800 feet of protective boom at a 45º angle or a "V" pattern to insure pollution does not enter Pavell Island.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	5 ft.	**Width of inlet:**	No cut exceeding 100 ft at a 45º angle

Site Specific Information
TGLO Response Atlas Map #1, Polygon #7,22;
Sabine River-Site #13

Site Information

Site 13 is Conway Bayou, which is located on the Louisiana side of the Sabine River. This site is approximately 2 ¾ miles North of Adams Bayou (Site 15) and near Pavell Island (Site 11). This Bayou feeds a highly sensitive marsh in Louisiana.

(b) (7)(F) [redacted]

NOAA chart #:	1342	**County:**	Calcasieu Parish
Nearest ICW Marker:	N/A	**Date last visited:**	1/11/00

Access

Closest Boat Ramp:	Orange Boat Club
Distance:	12 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be located on the left hand side of the road just past the Adam's Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: **High**
Environmental: Waterfowl, intermediate marsh
Economic: Commercial traffic on the ICWW

Safety / Cautionary Notes

There are submerged metal boat hulls located in Berwick cut, near Conway Bayou. Caution should be used when operating a boat in this area.

Booming Strategy Recommendations

Recommendations: Use 300 feet of protective boom, at a 45º angle or "V" pattern, to ensure pollution does not enter this sensitive area.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2-4 ft.	**Width of inlet:**	110 ft. at a 45º angle

Site Specific Information

TGLO Response Atlas Map #1, Polygon #N/A, Sabine River-Site #14

Site Information

Site 14 is the Port of Orange. The Port could stage a response and has good access for a vacuum truck to pick up oil. Be advised that there is a small tidal inlet located at the Northwest end of the Port. This tidal inlet feeds a small marsh area located to the West. This tidal inlet would need to be protected if oil enters this area. To reach the Port of Orange you would take Hwy 69/96 to Hwy 73 East. Hwy 73 East will intersect with Hwy 87 East in Groves. Continue on Hwy 87/73 East until you reach FM 1006. Turn Right on FM 1006 and continue until you reach Alabama St. Turn Right on Alabama St. This road will lead you directly to the front gate of the Port of Orange.

(b) (7)(F) [redacted]

NOAA chart #:	11342	**County:**	Orange
Nearest ICW Marker:	N/A	**Date last visited:**	1/11/00

Access

Closest Boat Ramp:	Bluebird Fish Camp
Distance:	15 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Bluebird Fish Camp you would take Hwy 69/96 South to Hwy 73 East. Hwy 73 East will intersect with Hwy 87 East in Groves. Stay on Hwy 87/73 East into the City of Orange. When Hwy 87 East turns North toward IH10, continue East on Green Ave to Simmons Dr. Turn Left on Simmons Dr. Bluebird Fish Camp will be on your Right approximately 1 mile down.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388
	Pin # 129-340
TGLO-via hotline	(800) 832-8224
Bluebird Fish Camp	(409) 886-4438
Port of Orange	(409) 883-4363

Resources at Risk

Atlas Priority: Low
Environmental: Waterfowl, alligators
Economic: Port of Orange, commercial traffic

Safety / Cautionary Notes

Shallow at low tide, reptiles in area

Booming Strategy Recommendations

Recommendations: Use 1000 feet of protective boom at a 45º angle if the decision is made to keep oil out of this area. If this area is used as a collection point than the boom needs to be configured in a collection formation.

Number of personnel:	2-4	**Tidal influence:**	Low
Water depth at mouth:	29 ft.	**Width of inlet:**	468 ft.

Site Specific Information
TGLO Map #1, TGLO Polygon #8,14,23;
Sabine River-Site #15

Site Information

Site 15 is the mouth of Adams Bayou, which is located on the Texas side of the Sabine River approximately 8 miles South of IH10. The Lower Neches Wildlife Management Area makes up the North bank of Adams Bayou. The banks consist of intermediate marsh flora and fauna.

(b) (7)(F)

NOAA chart #: 11342 **County:** Orange
Nearest ICW Marker: N/A **Date last visited:** 1/11/00

Access

Closest Boat Ramp: Orange Boat Club
Distance: 8 minutes
Boat type recommended: Shallow, Aluminum hull
Closest Airport: Jefferson County, Orange County
Closest Helicopter Landing: Orange County Airport

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be located on the left hand side of the road just past the Adam's Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Dupont Sabine River Works	(409) 886-6442

Resources at Risk

Atlas Priority:	**High**
Environmental:	Waterfowl and intermediate marsh
Economic:	Commercial traffic from ICWW, Dupont Sabine River Works' intake is located on Adams Bayou

Safety / Cautionary Notes

High volume recreational and commercial traffic

Booming Strategy Recommendations

Recommendations:	Use 600 feet of protective boom at a 45º angle or a "V" pattern.		
Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	13 ft.	**Width of inlet:**	360 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #1, Polygon #8,14,23;
Sabine River-Site #16

Site Information

Site16 is a man made canal located on the Louisiana side of the Sabine River approximately 8 miles South of IH10. This canal feeds a highly sensitive marsh in Louisiana. The mouth of this canal has several pipeline warning signs. Approximately 10 pipelines run through this area. There is gate at the mouth of the canal that may be locked on occasion. See contact numbers below for access to this canal.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Calcasieu Parish
Nearest ICW Marker:	N/A	**Date last visited:**	1/11/00

Access

Closest Boat Ramp:	Orange Boat Club
Distance:	20 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be located on the left hand side of the road just past the Adam's Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Colonial Pipeline	(800) 388-0219

Resources at Risk

Atlas Priority: Low
Environmental: Intermediate marsh habitat
Economic: Pipelines and commercial traffic

Safety / Cautionary Notes

Submerged pipelines

Booming Strategy Recommendations

Recommendations: Use 200 feet of protective boom at a 45º angle if possible.

Number of personnel:	2-4	**Tidal influence:**	Low
Water depth at mouth:	8 ft.	**Width of inlet:**	90 ft. across

Site Specific Information
TGLO Response Atlas Map #1, Polygon #9,14,23; Sabine River-Site #17

Site Information

Site 17 is a pipeline canal located on the Texas side of the Sabine River approximately 9 miles South of IH10. This canal has a gate at the entrance, which is kept locked. There is a pipeline warning sign that reads "Kinder Morgan". See contact numbers below for access to this site. This canal is recognizable by power-lines running overhead.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Orange
Nearest ICW Marker:	N/A	**Date last visited:**	1/11/00

Access

Closest Boat Ramp:	Orange Boat Club
Distance:	15 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be located on the left hand side of the road just past the Adam's Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Kinder Morgan Energy Partners	(800) 844-5658

Resources at Risk

Atlas Priority: Low
Environmental: Intermediate marsh habitat
Economic: Commercial traffic, pipeline company

Safety / Cautionary Notes

Reptiles in area, high volume of commercial traffic

Booming Strategy Recommendations

Recommendations: Use 500 feet of protective boom at a 45º angle or "V" pattern.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	12 ft.	**Width of inlet:**	240 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #1,2, Polygon #9,23;
Sabine River-Site #18

Site Information

Site 18 is a tributary of Cow Bayou (Site 19) located on the Texas side of the Sabine River. It is approximately 10 miles South of IH10. The banks of this tributary consist of intermediate marsh. A highly sensitive marsh is located across the Sabine River in Louisiana.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Orange
Nearest ICW Marker:	N/A	**Date last visited:**	1/11/00

Access

Closest Boat Ramp:	Orange Boat Club
Distance:	18 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be located on the left hand side of the road just past the Adam's Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: Low
Environmental: Intermediate marsh habitat
Economic: Commercial traffic

Safety / Cautionary Notes

High volume of commercial traffic, reptiles in area

Booming Strategy Recommendations

Recommendations: Use 500 feet of protective boom at a 45º angle or a "V" pattern.

Number of personnel:	2-4	**Tidal influence:**	Low
Water depth at mouth:	6 ft.	**Width of inlet:**	330 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #1, Polygon #14,21; Adams Bayou-Site #23



Site Information

Site 23 consists of a series of 10 inlets South of FM 1006 on Adams Bayou. There are several important points along this section of the Bayou: Orange Yacht Club, Orange Marine Towing & Salvage, Star Shipbuilding, Dupont Sabine River Works, and the Lower Neches Wildlife Management Area. The banks of the Bayou near these sites consist of freshwater to brackish water marsh and scattered trees. Adams Bayou leads into the Sabine River approximately 1 ¾ miles South of FM 1006.

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Nearest ICW Marker #	N/A	**Date last visited:**	1/13/00

Access

Closest Boat Ramp:	Orange Boat Club
Distance:	0-20 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County

Directions from MSU Port Arthur

To reach Orange Boat Club you would take Hwy 69/96 South to Hwy 73 East. Continue through Bridge City to FM 1006/Chemical Rd. Turn Right on FM 1006/Chemical Rd. Orange Boat Club will be on the Left-hand side past the Adams Bayou Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
City of Orange Fire Dept	(409) 883-8533
Lower Neches Wildlife Management Area	(409) 736-2551
Orange Boat Club	(409) 883-8023

Resources at Risk

Atlas Priority: Low
Environmental: Freshwater marsh and brackish marsh
Economic: Residential and industrial area

Safety/Cautionary Notes

Shallow, submerged stumps and logs, reptiles in the area

Booming Strategy Recommendations

Recommendations: There are no inlets greater than 500 feet in width on Adams Bayou South of FM 1006/Chemical Rd. The key areas mentioned in the Site Information sections would be the places that may require attention. Use up to 1000 feet of protective boom at a 45º angle if possible.

Number of personnel:	2	**Tidal influence:**	Low
Water depth:	1-18 ft.	**Width of inlet:**	500 ft.

Site Specific Information
TGLO Response Atlas Map #2, Polygon #21,20;
Sabine River-Site # 19

Site Information

Site 19 is the intersection of Cow Bayou and Sabine River. This is a wide inlet located approximately 3 ¼ miles North of where the Sabine River meets Sabine Lake. The banks of the Bayou consist of salt/brackish water marsh. There are several boat launches located on Cow Bayou. Port Neches Park is an excellent launch site and staging area. Using Port Neches Park to reach Cow Bayou would require crossing the Neches and Sabine River intersection/Thousand Foot Cut. This area can be rough and have high seas when the winds are out of the E, SE or NE.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	270	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; Leblanc's Marina
Distance;	20 minutes; 10 minutes
Boat type recommended	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to East Round Bunch Road/FM1442. Turn right on East Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: Low
Environmental: Salt/brackish marsh habitat
Economic: Industrial area

Safety/ Cautionary Notes

Commercial vessel traffic

Booming Strategy Recommendations

Recommendation: Use 600 feet of protective boom at a 45º angle from the South to the Northeast bank. A sandy point is located near the range marker. Stakes will be needed to anchor boom.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	17 ft.	**Width of inlet:**	550 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygon #21,20; Cow Bayou-Site #24

Site Information

Site 24 is an inlet located on the West bank of Cow Bayou approximately ¼ of a mile from where Cow Bayou empties into the Sabine River. This inlet feeds the salt/brackish marsh located North of Sabine Lake. This site is near a " Do Not Dredge" sign, as seen in the picture above.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; Leblanc's Marina
Distance	25 minutes; 7 minutes
Boat type recommended:	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: Low
Environmental: Salt/brackish marsh habitat
Economic: Residential area

Safety/ Cautionary Notes

Recreational vessel traffic

Booming Strategy Recommendation

Recommendation: Use 500 feet of protective boom at a 45º angle. Stakes will be needed for boom.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	7 ft.	**Width of inlet:**	520 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygon #19**;**
Cow Bayou-Site #25

Site Information

Site 25 is an inlet located on the East bank of Cow Bayou, approximately ¼ mile West of where Cow Bayou empties into the Sabine River. This inlet is a tributary of Cow Bayou and eventually leads to a pipeline canal and then into the Sabine River. See Sites 17 and 18.

(b) (7)(F)

NOAA chart #:	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; Leblanc's Marina
Distance:	25 minutes; 5 minutes
Boat type recommended:	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Praxair Pipeline	(800) 926-9620

Resources at Risk

Atlas Priority:	**Low**
Environmental:	Salt/brackish marsh habitat, threatened osprey, alligator, wading birds
Economic:	Residential area

Safety/ Cautionary Notes

Recreational vessel traffic

Booming Strategy Recommendation

Recommendation:	Use 400 feet of protective boom at a 45º angle. Stakes will be needed for boom.		
Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	7 ft.	**Width of inlet:**	375 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygon #10,18;
Cow Bayou-Site #26

Site Information

Site 26 is a winding inlet located on the West bank of Cow Bayou approximately 1 ¼ miles from where Cow Bayou empties into the Sabine River. This inlet curves several times and then leads back into Cow Bayou approximately ¾ of a mile North of this location. See Site 27. The banks of this inlet consist of brackish marsh flora and fauna. Bayer Inc. has a private boat ramp (pictured above) located approximately 300 feet northwest and across the Bayou from this inlet. To gain road access to this private boat launch you would take Hwy 69/96 South to Hwy 73 East. Take FM 1006/Chemical Road to the small paved road located between Bayer Inc and Print Pac. This road will bring you to the boat launch.

(b) (7)(F) [redacted]

NOAA chart #:	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; Leblanc's Marina
Distance:	25 minutes; 7 minutes
Boat type recommended:	Varies, depending on launch, aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: Low
Environmental: Salt/brackish marsh habitat, threatened osprey, alligator, wading birds
Economic: N/A

Safety/ Cautionary Notes

Recreational vessel traffic, rip rap along shoreline

Booming Strategy Recommendation

Recommendation: Use 600 feet of protective boom. Trees are located on the banks and could be used to anchor boom.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	7 ft.	**Width of inlet:**	320 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygon #10,17,18; Cow Bayou-Site #27

Photograph Not Available

Site Information

Site 27 consists of two inlets located on the East and West bank of Cow Bayou approximately 1 ¾ miles West of where Cow Bayou empties into the Sabine River. This site is located just Southeast of Mule Island. The banks consist of brackish marsh flora and fauna.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; Leblanc's Marina
Distance:	25 minutes; 5 minutes
Boat type recommended:	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: **Medium**
Environmental: Salt/brackish marsh habitat, threatened osprey, alligator, wading birds
Economic: Residential area

Safety/ Cautionary Notes

Recreational vessel traffic

Booming Strategy Recommendation

Recommendation: Use two sections of 100 feet of protective boom at a 45º angle. Stakes will be needed for boom.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	7 ft.	**Width of inlet:**	60 ft. and 45 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygon #6,9,17;
Cow Bayou-Site #28

Site Information

Site 28 is a series of 8 inlets located on both the East and West banks of Cow Bayou. These inlets begin just North of the Mule Island and end at the Hwy 87 Bridge. Cow Bayou's banks, at this location, hosts a variety of shoreline types. This section is primarily a residential and commercial area.

(b) (7)(F)

[redacted]

NOAA chart #:	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Toup's Marina; Leblanc's Marina
Distance:	0-10 minutes; 0-10 minutes
Boat type recommended:	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Toup's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City. Toup's Marina is located under the Hwy 73 Bridge where it crosses Cow Bayou.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	Brackish/freshwater marsh habitat, threatened osprey, alligator, wading birds
Economic:	Residential and commercial area

Safety/ Cautionary Notes

Recreational vessel traffic

Booming Strategy Recommendation

Recommendation:	There are 8 potential inlets. Use 200 feet of protective boom at a 45º angle for each inlet.		
Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	10 ft.	**Width of inlet:**	8 inlets not over 200 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygon #17;
Cow Bayou-Site #29

Site Information

Site 29 consists of the oxbow leading to Burton's Shipyard and the adjacent boat slip. This site is located on the West bank of Cow Bayou, just north of Leblanc's Marina. This oxbow is shallow in places with submerged structures that may damage a boat. There is a small private boat launch located near this site. There are several water front homes in this area that may require attention.

(b) (7)(F)

NOAA chart #:	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Toup's Marina; Leblanc's Marina
Distance:	5 minutes; 10 minutes
Boat type recommended:	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Toup's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City. Toup's Marina is located under the Hwy 73 Bridge where it crosses Cow Bayou.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Burton's Shipyard	(409) 735-2491

Resources at Risk

Atlas Priority: **Medium**

Environmental: Intermediate marsh habitat, threatened osprey, alligator, and wading birds

Economic: Burton's Shipyard

Safety/ Cautionary Notes

Submerged structures/objects that may damage boats. Water is shallow in places.

Booming Strategy Recommendation

Recommendation: Three inlets: N inlet use 350 ft.; S inlet use 350 ft.; Northern most slip use 300 ft. All boomed at a 45° angle.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	7 ft.	**Width of inlets:**	288 ft.; 350 ft, 300 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #2, Polygons #2,3,4; Cow Bayou-Site #30

Site Information

Site 30 consists of a series of inlets on Cow Bayou located on the East and West bank. These inlets are located North of Hwy 87 up to FM 105 on Cow Bayou. The banks of the Bayou consist of freshwater swamp/marsh. There are residential areas scattered along the banks. This part of the Bayou is popular for recreational traffic in the summer months.

(b) (7)(F)

NOAA chart #:	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Toup's Marina; Leblanc's Marina
Distance:	35 minutes; 10minutes
Boat type recommended:	Small, medium; aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Toup's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City. Toup's Marina is located under the Hwy 73 Bridge where it crosses Cow Bayou.

To reach Leblanc's Marina you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East through Bridge City to Round Bunch Road/FM1442. Turn right on Round Bunch Road/FM 1442. Leblanc's Marina is located where Round Bunch Road/ FM 1442 crosses Cow Bayou.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224

Resources at Risk

Atlas Priority: Low
Environmental: Freshwater marsh/swamp
Economic: Residential area

Safety/ Cautionary Notes

Shallow, submerged stumps and logs, reptiles in area

Booming Strategy Recommendation

Recommendation: There are several key areas that may need protection: Marie Gully is one. Bring 2000 feet of protective boom for the 10 inlets.

Number of personnel: 2-4
Tidal Influence: Low
Water depth at mouth: 1-7 ft.
Width of inlet: Varies

Site Specific Information
TGLO Response Atlas Map #3, Polygon #1,2,4,5,6;
Neches River-Site #41

Site Information

Site 41 is the first unnamed inlet South of Bessie Heights Canal located on the East bank of the Neches River. It is approximately 1 mile from Port Neches Park. This inlet leads to Bessie Heights Oil and Gas Field. This inlet is only accessible by a small john boat due to pilings positioned in the middle of the channel. The shore is mixed with open range and brush. A cattle ranch is located along the banks.

(b) (7)(F) [redacted]

Nearest ICW marker: N/A **Date last visited:** 3/09/06

Access

Closest Boat Ramp:	Port Neches Park
Distance:	5 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: High
Environmental: Brackish marsh habitat for threatened osprey, river otter, wading birds, shore birds, waterfowl, fish, shrimp and crab
Economic: Cattle Ranch

Safety/ Cautionary Notes

Pilings are located in center of channel, strong currents, and reptiles in area

Booming Strategy Recommendation

Recommendation: Refer to the picture below for booming strategy.
Number of personnel: 6-8 **Tidal Influence:** High
Water depth at mouth: 13 ft. **Width of inlet:** 330 ft. at 45° angle
Equipment:
1100 ft of 18" boom
4 anchor systems with 40lb anchors
8 towing bridles for booming systems
8 T-posts
Come-along or block-and-tackle (to assist in the tightening of boom from shore)
3 boats
Proper length of line

Site Specific Information
TGLO Response Atlas Map #3, Polygon #1,2,4,5,6; Neches River-Site #42

Site Information

Site 42 is Bessie Heights Canal. This site is located on the East bank of the Neches River approximately 1 ¼ miles North of Port Neches Park. This canal leads to Bessie Heights Oil and Gas field and a highly sensitive marsh. The banks of this inlet consist of sand, clay, flat grassland, and brush. Both banks are used for cattle ranching.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	4/27/06

Access

Closest Boat Ramp:	Port Neches Park
Distance:	6 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: High

Environmental: Brackish marsh habitat for threatened osprey, river otter, wading birds, shore birds, waterfowl, fish, shrimp and crab.

Economic: Cattle Ranch

Safety/ Cautionary Notes

Strong currents are present in this area

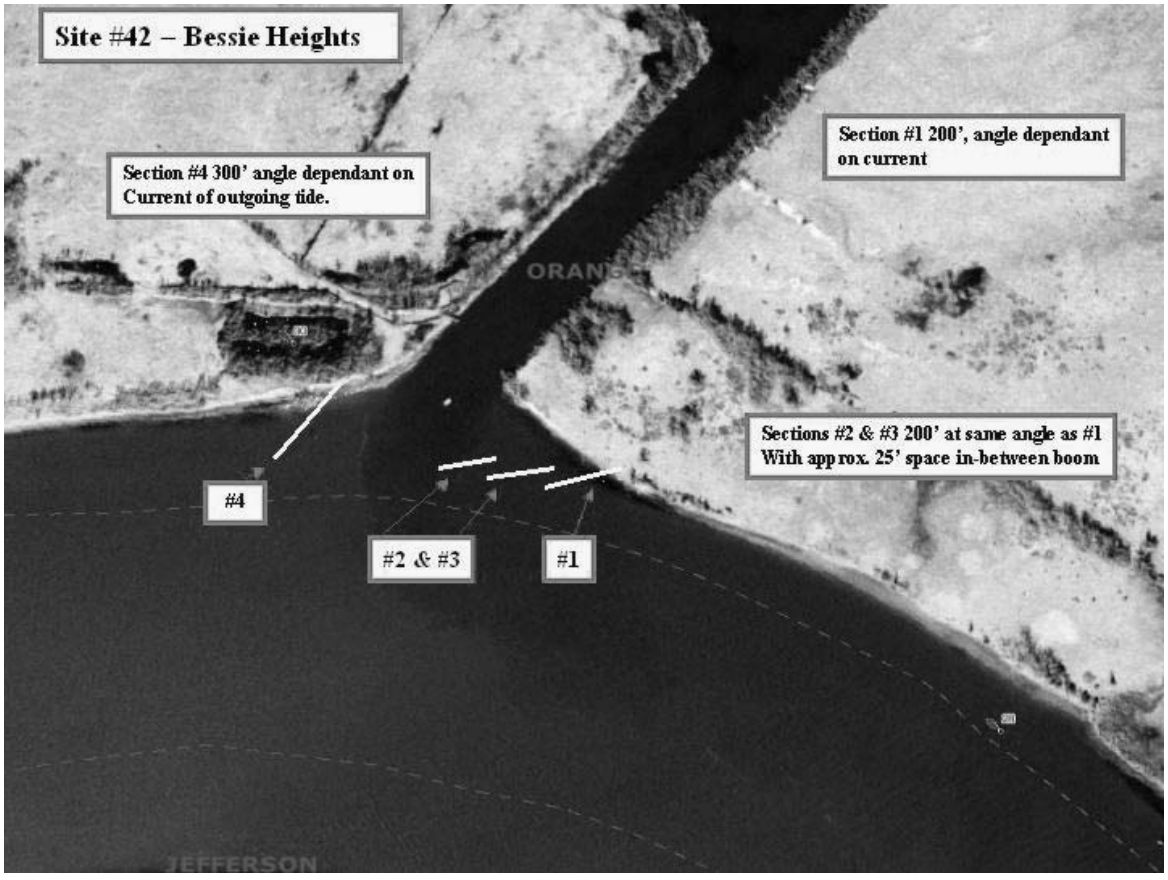
Booming Strategy Recommendation

Recommendation: Refer to picture below for booming strategy.

Number of personnel:	8-10	**Tidal Influence:**	High
Water depth at mouth:	10.5 ft.	**Width of inlet:**	350 ft. at a 45° angle

Equipment:

3 X 200ft of 18" boom
1 X 300ft of 18" boom
4 anchor systems with 40lb anchors
4 floats for anchor systems
8 towing bridles for booming systems
8 T-posts
Come-along or block-and-tackle (to assist in the tightening of boom from shore)
3 boats
Proper length of line



Site Specific Information

TGLO Response Atlas Map #3, Polygon #1,2,4,5,6;
Neches River-Site #43

Site Information

Site 43 is the natural Gray's Bayou. This site is located on the East bank of the Neches River approximately 1 ¾ miles North of Port Neches Park. This Bayou feeds Bessie Heights marsh, which is a highly sensitive brackish marsh. The banks of this Bayou consist of sand, clay, flat grassland, and brush.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	6 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **High**

Environmental: Brackish marsh habitat for threatened osprey, river otter, wading birds, shore birds, waterfowl, fish, shrimp and crab

Economic: Cattle Ranch

Safety/ Cautionary Notes

Strong currents are present in this area, submerged objects

Booming Strategy Recommendation

Recommendation: Use 800 feet of protective boom. Due to strong tidal flow double boom and/or a "V" strategy may be needed.

Number of personnel:	2-4	**Tidal Influence:**	High
Water depth at mouth:	2-5 ft.	**Width of inlet:**	450 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #3, Polygon #1,2,4; Neches River-Site #44

Site Information

Site 44 is the man-made Gray's Canal. This site is located approximately 2 miles North of Port Neches Park on the East bank of the Neches River. This canal feeds Bessie Heights marsh, which is a highly sensitive area. There are pipelines crossing warning signs on both banks of this canal.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	7/19/05

Access

Closest Boat Ramp:	Port Neches Park
Distance:	8 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **High**

Environmental: Brackish marsh habitat for threatened osprey, river otter, wading birds, shore birds, waterfowl, fish, shrimp and crab

Economic: Cattle Ranch

Safety/ Cautionary Notes

Strong currents, submerged objects, and reptiles may be present in this area

Booming Strategy Recommendation

Recommendation: Use 450 feet of protective boom. Due to strong tidal flow double boom and/or a "V" strategy may be needed. Refer to the picture below for booming strategy.

Number of personnel: 2-4 **Tidal Influence:** High

Water depth at mouth: 3-5 ft. **Width of inlet:** 150 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #3, Polygon #1,2,4;
Neches River-Site #45

Site Information

Site 45 is the intake point for Unocal located approximately 2 ½ miles North of Port Neches Park on the West bank of the Neches River. Notify Unocal if a spill threatens this area.

(b) (7)(F)

Nearest ICW marker: N/A **Date last visited:** 2/1/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	12 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Don Stuckey with Unocal	(409) 722-3213

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Brackish marsh habitat across Neches River
Economic: Unocal

Safety/ Cautionary Notes

Commercial vessel traffic in area

Booming Strategy Recommendation

Recommendation:	Inform Unocal if a spill threatens this site.		
Number of personnel:	2	**Tidal Influence:**	Low
Water depth at mouth:	40 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #3, Polygon #N/A;
Neches River-Site #46

Site Information

Site 46 is the intake point for Sunoco located on the West side of the Neches River approximately 2 ½ miles North of Port Neches Park. Sunoco would need to be informed if a spill threatens this area.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/2/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	12 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Sunoco	(409) 721-4802

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Brackish marsh habitat
Economic: Sunoco

Safety/ Cautionary Notes

Commercial traffic, contact Sunoco before working in this area

Booming Strategy Recommendation

Recommendation:	Contact Sunoco		
Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	25 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #47

Site Information

Site 47 is Anderson Gully, which is located approximately 4 miles North of Port Neches Park on the East bank of the Neches River. (b) (7)(F) [redacted] ly. A green PVC pipe identifies this wash over. The pipe previously served as an outlet for dredge spoil water. There is a primitive road that leads to this wash over. You would take IH10 to FM 105 West in Vidor. FM 105 makes a 90° curve at Mansfield Ferry Rd. Turn onto Mansfield Ferry Rd. Travel approximately 6-7 miles down. The condition of this road is questionable. Use caution.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	14 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

US Dept of Transportation
MARAD/Beaumont Reserve
Fleet (409) 722-3433

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Brackish marsh habitat
Economic: MARAD/Beaumont Reserve Fleet, cattle ranch

Safety/ Cautionary Notes

All personnel need to contact the MARAD office before entering the site, shallow, reptiles in area

Booming Strategy Recommendation

Recommendation: Use 300 feet of protective boom. "V" strategy may be needed. Use front-end loader to pile up sand to eliminate water exchange at tidal wash over.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	2-3 ft.	**Width of inlet:**	150 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #49

Site Information

Site 49 is Union Canal and Twin Lakes. This site is located approximately 1¼ miles South of the GSU Canal on the West bank of the Neches River. It is located North of Port Neches Park approximately 5 ¾ miles. Union Canal's South bank consists of a very narrow strip of land that forms an island during low tides.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU Canal boat launch
Distance:	18 minutes; 5 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Wading birds may be present
Economic: N/A

Safety/ Cautionary Notes

Shallow

Booming Strategy Recommendation

Recommendation: Use 800 feet of protective boom across the entire inlet due to water level rising above small island

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	25 ft.	**Width of inlet:**	600 ft. across all

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #50

Site Information

Site 50 is the PD Glycol Intake Canal. It is located on the West bank of the Neches River approximately 8 ¼ miles North of Port Neches Park. This site consists of three inlets that merge to form one canal that is the intake point for PD Glycol. This canal feeds a small spoil bank area that is habitat for waterfowl and wading birds. The following coordinates range from first inlet to the last inlet.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU Canal boat launch
Distance:	20 minutes, 6 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
PD Glycol	(409) 838-4521

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: PD Glycol

Safety/ Cautionary Notes

Shallow, pipelines

Booming Strategy Recommendation

Recommendation: Use protective boom at a 45º angle towards the mouth of each inlet. Sections of 600, 500, and 500 feet are suggested.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	11 ft.	**Width of inlet:**	450 ft., 370 ft., 300 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #51

Site Information

Site 51 is an unnamed inlet located on the East bank of the Neches River approximately 8 ¼ miles North of Port Neches Park and 5 ¼ miles South of IH10. This inlet leads to a sensitive marsh Southeast of Rose City Oil Field. This inlet is directly across the Neches River from PD Glycol's intake canal (Site 50).

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU Canal boat launch
Distance:	20 minutes, 6 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
PD Glycol	(409) 838-4521

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Intermediate marsh habitat
Economic: PD Glycol

Safety/ Cautionary Notes

Shallow, reptiles in area

Booming Strategy Recommendation

Recommendation: Use 200 feet of protective boom at a 45º angle.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	5 ft.	**Width of inlet:**	150 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #52

Site Information

Site 52 is a series of six inlets located within an oxbow/anchorage on the East bank of the Neches River. Star Bayou and Meyer Bayou are the major inlets of this site. This oxbow/anchorage is located approximately 8 ½ miles North of Port Neches Park and 5 miles South of IH10. The inlets off of this oxbow/anchorage are wide with fresh/brackish marsh shores and lead to the sensitive Rose City Marsh.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU canal boat launch
Distance:	23 minutes, 4 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Fresh/Brackish marsh habitat
Economic: N/A

Safety/ Cautionary Notes

Shallow in some areas

Booming Strategy Recommendation

Recommendation: Use protective boom at a 45º angle or "V" pattern with sections of 100 ft., 100 ft., 800 ft., 200 ft., 50 ft, 1100 ft., 450 ft., and 100 ft. from east to west.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	7 ft.	**Width of inlet:**	From E to W: 30 ft., 30 ft., 402 ft., 100 ft., 20 ft., 550 ft.

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #53

No Photograph Available

Site Information

Site 53 is the Old GSU Power Plant Canal located on the West bank of the Neches River. This canal is located approximately 9 miles North of Port Neches Park and 3 ½ miles South of IH10. There is a small boat launch located on this canal. The banks consist of steep bulkhead and a few low wooded areas.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	GSU Canal boat launch
Distance:	On site
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: GSU intake

Safety/ Cautionary Notes

Shallow in some areas

Booming Strategy Recommendation

Recommendation: Use 400 feet of protective boom at a 45º angle or "V" pattern.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	18 ft.	**Width of inlet:**	339 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #54

Site Information

Site 54 is the Rose City Oil Field Canals, which are located within an oxbow that is on the East bank of the Neches River. This oxbow is approximately 9 ½ miles North of Port Neches Park and 4 miles South of IH10. This oxbow is almost directly across the Neches River from the GSU boat launch canal. The Rose City Oil Field Canals form a 90° angle on the North bank of this oxbow. The canals have high wooded banks in some spots and low brackish marsh banks in others. These two canals feed the sensitive Rose City Oil Field Marsh.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU Canal boat launch
Distance:	25 minutes, 5 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Brackish marsh habitat
Economic: N/A

Safety/ Cautionary Notes

Shallow, reptiles in area

Booming Strategy Recommendation

Recommendation: Use 1000 feet total of protective boom at a 45º angle or "V" pattern in 2 equal sections for each canal.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	13 ft.	**Width of inlet:**	225 ft., 225 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #55

Site Information

Site 55 is the canal just South of the Exxon Mobil docks located on the West bank of the Neches River. This site is North of the Old GSU Canal approximately ½ mile and 3 ½ miles South of IH10.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU Canal boat launch
Distance:	25 minutes, 2 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Exxon Mobil Refinery	(409) 833-9411
or	(409) 757-3237

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Exxon Mobil Refinery

Safety/ Cautionary Notes

Shallow near banks. Contact Exxon Mobil before working in this area.

Booming Strategy Recommendation

Recommendation: Exxon Mobil has a reel of boom (Boom Reel #3) on site. 800 feet of boom would protect this inlet.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	27 ft.	**Width of inlet:**	738 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #56

No Photograph Available

Site Information

Site 56 is Brakes Bayou, which is located on the West bank of the Neches River approximately ½ mile South of IH10. The Beaumont Yacht club has a launch within a few minutes, however arrangements must be made to gain access through the gate.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; GSU Canal boat launch; Beaumont Yacht Club
Distance:	30 minutes; 10 minutes; 16 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the GSU Canal boat launch you would take Hwy 69/96 North to MLK Pkwy exit. Take MLK Pkwy North towards IH10. Turn Left on Washington and then turn Right onto Irving. Turn Right on Madison and travel to the first stop sign, which is Sycamore, and turn Right. You will pass over one set of railroad tracks. The road will make a 90-degree turn to the Left. Follow this road almost to the Old GSU Plant. The GSU Canal boat launch will be on the Left-hand side of the road.

To reach the Beaumont Yacht Club you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. and then a Right on Marina Dr. Follow the signs to the Beaumont Yacht Club.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Beaumont Fire Dept.	(409) 838-6371
Beaumont Yacht Club	(409) 833-0139

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Downtown Beaumont

Safety/ Cautionary Notes

Shallow near banks

Booming Strategy Recommendation

Recommendation: Use 500 feet of protective boom at a 45º angle.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	11 ft.	**Width of inlet:**	450 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #57

Site Information

Site 57 is the Beaumont Yacht Club. This site is located on the West bank of the Neches River approximately 1/8 of a mile North of IH10. The Yacht Club is not accessible to the public after hours and on certain days. Personnel should call before trying to access the boat launch. There is also a small inlet immediately North of this site. This small inlet could serve as a staging area or containment area.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park; Beaumont Yacht Club; Colliers Ferry Landing
Distance:	35 minutes; On site; 25 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the Beaumont Yacht Club you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. and then a Right on Marina Dr. Follow the signs to the Beaumont Yacht Club.

To reach Colliers Ferry Landing you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. Pine St. will dead end at Colliers Ferry Landing Park.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Beaumont Fire Dept.	(409) 838-6371
Beaumont Yacht Club	(409) 833-0139

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Downtown Beaumont, Beaumont Yacht Club

Safety/ Cautionary Notes

Rip-rap is submerged along banks

Booming Strategy Recommendation

Recommendation: The inlet to the west may be utilized as a collection point. To boom both the Yacht Club entrance and small inlet to the North would take two sections of boom at 300 and 200 feet.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	20 ft.	**Width of inlet:**	225 ft, 100 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #58

Site Information

Site 58 is the first inlet North of the Beaumont Yacht Club. This inlet is located on the West bank of the Neches River approximately ¾ of a mile North of IH10. The Yacht Club gates are locked after hours and on certain days. Personnel should call before trying to access the boat launch. The banks of this inlet are wooded with a sand substrate. The banks of the Neches River drop off quickly just a few feet from shore.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/2/00

Access

Closest Boat Ramp:	Port Neches Park; Beaumont Yacht Club; Colliers Ferry Landing
Distance:	35 minutes; 5 minutes; 20 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the Beaumont Yacht Club you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. and then a Right on Marina Dr. Follow the signs to the Beaumont Yacht Club.

To reach Colliers Ferry Landing you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. Pine St. will dead end at Colliers Ferry Landing Park.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Beaumont Fire Dept.	(409) 838-6371
Beaumont Yacht Club	(409) 833-0139

Resources at Risk

Atlas Priority: **Not rated at this time. Area may require attention.**
Environmental: Freshwater swamp/marsh habitat
Economic: Residential area near this site

Safety/ Cautionary Notes

Submerged trees/ logs, recreational traffic

Booming Strategy Recommendation

Recommendation: Use 200 feet of protective boom at a 45º angle or "V" pattern

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	10 ft.	**Width of inlet:**	189 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #59



Site Information

Site 59 consists of three inlets and is located on the East bank of the Neches River approximately 1 mile North of IH10. The inlets form an oxbow that leads to Bairds Bayou, which crosses under IH10 near Vidor. Bairds Bayou leads to Bo-Mac Contractors Facility. The shore is wooded with sandy banks. The banks of the river drop off very quickly just a few feet from shore. Due to the thick vegetation and lack of road access, this site would be difficult to clean if oil was allowed to enter the inlets.

(b) (7)(F) [redacted]

Nearest ICW marker: N/A **Date last visited:** 2/2/00

Access

Closest Boat Ramp:	Beaumont Yacht Club; Colliers Ferry Landing
Distance:	8 minutes; 16 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach the Beaumont Yacht Club you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. and then a Right on Marina Dr. Follow the signs to the Beaumont Yacht Club.

To reach Colliers Ferry Landing you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. Pine St. will dead end at Colliers Ferry Landing Park.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Bo-Mac Contractors	(409) 842-2125
Beaumont Yacht Club	(409) 833-0139

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Freshwater swamp/marsh habitat
Economic: Bo Mac Contractors

Safety/ Cautionary Notes

Submerged trees/ logs, shallow near banks, reptiles in area

Booming Strategy Recommendation

Recommendation: Use 200, 250 and 500 feet of protective boom at a 45° angle or "V" pattern

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	18 ft.	**Width of inlet:**	168 ft., 285 ft., 432 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #4, Polygon #N/A;
Neches River-Site #60

Site Information

Site 60 is an inlet located approximately 2 miles North of IH10 on the East bank of the Neches River. The banks of the inlet are wooded with sand substrate. This inlet eventually leads to Ross Ridge, which is a sensitive freshwater swamp habitat.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	2/2/00

Access

Closest Boat Ramp:	Beaumont Yacht Club; Colliers Ferry Landing
Distance:	10 minutes; 15 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach the Beaumont Yacht Club you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. and then a Right on Marina Dr. Follow the signs to the Beaumont Yacht Club.

To reach Colliers Ferry Landing you would take Hwy 69/96 South to Hwy 73 East. Take Hwy 73 East to Hwy 62 North/Hwy 73 East towards IH10. Take IH10 West towards Beaumont. Take the Pine St./Magnolia St. exit after you cross over the Neches River on IH10. Turn Right onto Pine St. Pine St. will dead end at Colliers Ferry Landing Park.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Beaumont Yacht Club	(409) 833-0139

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Freshwater marsh/swamp habitat
Economic: Recreational traffic

Safety/ Cautionary Notes

Submerged logs, reptiles, recreational traffic

Booming Strategy Recommendation

Recommendation:	Use 250 feet of protective boom at a 45º angle or "V" pattern		
Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	10 ft.	**Width of inlet:**	219 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #19,23; Sabine River-Site #20

Site Information

Site 20 is the mouth of Black Bayou. This site is located on the Louisiana side of the Sabine River/East Pass approximately 1 ¾ miles from the tip of Coffee Ground Cove Peninsula. Black Bayou feeds a high priority salt marsh located in Louisiana and on the Sabine National Wildlife Refuge.

(b) (7)(F)

NOAA chart #:	11343	**County:**	Cameron Parish
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	15 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Habitat for wading birds, crabs, shore birds, Sabine National Wildlife Refuge

Economic: N/A

Safety/ Cautionary Notes

Shallow, reptiles in area

Booming Strategy Recommendation

Recommendation: Use 600 feet at an angle. Stakes will most likely be needed to boom.

Number of personnel:	2-4	**Tidal Influence:**	Low
Water depth at mouth:	10 ft.	**Width of inlet:**	462 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #7;
Sabine River-Site #21

Site Information

Site 21 is a narrow cut located on the West side of the Sabine River that leads into Hickory Cove. The point where this inlet opens into Hickory Cove is Site 73. This cut is located ½ mile from the Northeast tip of Goat Island. This cut feeds the brackish marsh peninsula of Hickory Cove.

(b) (7)(F)

NOAA chart #:	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	10 minutes
Boat type recommended:	Varies, depending on launch, aluminum or steel hull
Closest Airport:	Jefferson County, Orange County
Closest Helicopter Landing:	Orange County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TGLO-via hotline	(800) 832-8224
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	Brackish marsh habitat, fish, crabs, shrimp, wading birds, shore birds
Economic:	Commercial/industrial traffic in area

Safety/ Cautionary Notes

Shallow, reptiles in area, high volume of vessel traffic

Booming Strategy Recommendation:

Recommendation:	Use 450 feet of protective boom at a 45º angle. Stakes will be needed to anchor boom.		
Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	1- 4 ft.	**Width of inlet:**	438 ft. at a 45° angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #2,3,5;
Neches River-Site #31

Site Information

Site 31 is the canal that leads to Rainbow Marina. This canal is located at the base of the South end of the Rainbow Bridge on the West bank of the Neches River. This site is approximately 1¼ miles from the point where the Neches River empties into Sabine Lake. Recreational boats, shrimp vessels, waterfront homes, and Esther's Seafood Restaurant are located within this site.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Rainbow Marina; Port Neches Park
Distance:	Adjacent; 10 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Rainbow Marina	(409) 962-9578
Esther's Seafood	(409) 962-6268

Resources at Risk

Atlas Priority: **Low**
Environmental: N/A
Economic: Rainbow Marina

Safety/ Cautionary Notes

Submerged structures next to bridge.

Booming Strategy Recommendation

Recommendation: Use 800 feet of protective boom at a 45º angle.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	10 ft.	**Width of inlet:**	519 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #1; Neches River-Site #32

Site Information

Site 32 is the canal that runs parallel to the North side of the Rainbow Bridge and is located on the East bank of the Neches River. This site is approximately 1¼ miles North of where the Neches River empties into Sabine Lake. This canal leads to a shallow marsh surrounding the bridge. The East bank of this marsh is part of the Lower Neches Wildlife Management Area.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Rainbow Marina; Port Neches Park
Distance:	1 minute; 10 minutes
Boat type recommended:	Acceptable for most small craft.
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
TX Parks & Wildlife	(409) 736-2551
Rainbow Marina	(409) 962-9578

Resources at Risk

Atlas Priority:	**Medium, High on East bank**
Environmental:	Lower Neches Wildlife Management Area on the East bank. Habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.
Economic:	Rainbow Marina Canal is directly across the Neches River from this inlet

Safety/ Cautionary Notes

Strong currents are present in this area, shallow near bridge, submerged structures present

Booming Strategy Recommendation

Recommendation:	Use 800 feet of protective boom at a 45º angle. The banks consist of soft mud. Stakes may be needed to anchor boom or the bridge supports/pilings may be used as anchors.		
Number of personnel:	2-4	**Tidal Influence:**	High
Water depth at mouth:	5 ft.	**Width of inlet:**	654 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #11,12,17; Old River/Hickory Cove-Site #65

Site Information

Site 65 is a shallow inlet inside Old River Cove and on the Northeast side of Humble Island. This inlet leads to a culvert located approximately 100 yards East of the Veteran's Memorial Bridge. Lower Neches Wildlife Management Area signs are posted at the mouth of this inlet. There is road access to this site from Hwy 73. Heading toward Bridge City you would take the first Right turn immediately after the Veteran's Memorial Bridge. This is an unnamed road that will lead to a gate. Once inside the gate the road leads directly to this culvert. This would be an excellent collection point that vacuum trucks could utilize.

(b) (7)(F) [redacted]

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	# N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	5 minutes, 10 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388

Pin # 129-340

Lower Neches Wildlife Management Area (409) 736-2551

Resources at Risk

Atlas Priority: **Medium**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp

Economic: Cattle Ranch

Safety/Cautionary Notes

Shallow, submerged objects not marked

Booming Strategy Recommendations

Recommendations: Use 600 feet of protective boom in a "V" pattern or at a 45º angle. This area could possibly be used as a collection point. See Site Information for road access.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	300 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #11,12,17;
Old River/Hickory Cove-Site #66

Site Information

Site 66 is the Entergy (formerly GSU) intake canal. It is located at the North end of Old River Cove. The Northeast bank of the canal is the Lower Neches Wildlife Management Area. There is a levee road on the Wildlife Management Area that could provide possible access to the canal.

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Near ICW Marker :	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	5 minutes, 10 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Lower Neches Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority: High

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.

Economic: Cattle Ranch, Entergy/GSU should be notified if a spill threatens this area.

Safety/Cautionary Notes

Shallow, submerged objects not marked

Booming Strategy Recommendations

Recommendations: Use 800 feet of protective boom in a "V" pattern or a 45º angle either at the mouth or near the bridge where Hwy 73 passes over this canal. The Hwy 73 bridge could be used as a collection point due to the road access available.

Number of personnel:	2	**Tidal influence:**	High
Water depth:	2 ft.	**Width of inlet:**	300 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #11,12,17;
Old River/Hickory Cove-Site #67

Site Information

Site 67 consists of two inlets that merge together and form a canal leading into the Lower Neches Wildlife Management Area. This canal is on the North side of Old River Cove and runs parallel to the road to Bailey's Fish Camp (Lake Street). .

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	5 minutes, 10 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Lower Neches Wildlife Management Area	(409) 736-2551
Bailey's Fish Camp	(409) 735-4298

Resources at Risk

Atlas Priority: **High**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp

Economic: Lower Neches Wildlife Management Area

Safety/Cautionary Notes

Shallow, submerged objects not marked.

Booming Strategy Recommendations

Recommendations: Use 400 feet of protective double boom at each mouth at a 45º angle or a "V" pattern.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	156 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #5, Polygon #12,17;
Old River/Hickory Cove-Site #68

Site Information

Site 68 is the mouth of Old River Bayou. This site is located on the Northeast side of Old River Cove. Bailey's Fish Camp is adjacent to this site and has a boat launch, snack items, and drinks. To get to Bailey's Fish Camp you would take Hwy 73 East into Bridge City. The first red light is Lake St. Take a Right on Lake St. and Bailey's is at the end of that road.

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	5 minutes, 10 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388
	Pin # 129-340
Lower Neches Wildlife	

Management Area	(409) 736-2551
Bailey's Fish Camp	(409) 735-4298

Resources at Risk

Atlas Priority: **High**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.

Economic: Bailey's Fish Camp

Safety/Cautionary Notes

Shallow, submerged objects not marked.

Booming Strategy Recommendations

Recommendations: You may need up to 1000 feet of boom for this area. It could be used as a collection point with excellent road access from Lake St. It could also be protected using the boom in a "V" pattern or at a 45º angle.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	300 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #6,7,19,27;
Old River/Hickory Cove-Site #69

Site Information

Site 69 is a small cove on the West side of Hickory Cove. The cove leads back to an open culvert that runs under a washed out road. A small pier is located a few hundred feet Northeast of this site. This road and pier can be accessed from the B.M. Odom Estate on East Round Bunch Rd in Bridge City.

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	10 minutes, 15 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388
	Pin # 129-340
Lower Neches Wildlife	

Management Area (409) 736-2551

Resources at Risk

Atlas Priority: **High**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.

Economic: N/A

Safety/Cautionary Notes

Shallow, submerged objects not marked

Booming Strategy Recommendations

Recommendations: Use 200 feet of protective boom in "V" pattern or at a 45º angle.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	30 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #6,7,19,27;
Old River/Hickory Cove-Site #70

Site Information
Site 70 is a long, winding inlet at the far end of Hickory Cove. An abandoned boathouse can be seen 100 yards inside of this inlet.

(b) (7)(F)

NOAA chart #	11342	**County:**	Jefferson
Near ICW Marker:	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	10 minutes, 15 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur
To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Lower Neches Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority: **Medium**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.

Economic: N/A

Safety/Cautionary Notes

Shallow, submerged objects not marked.

Booming Strategy Recommendations

Recommendations: Use 300 feet of protective boom in a "V" pattern or at a 45º angle.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	150 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #6,7,19; Old River/Hickory Cove-Site #71

No Photograph Available

Site Information
Site 71 is a small inlet at the very tip of Hickory Cove. This inlet feeds into a fairly sensitive area.

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	10 minutes, 15 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur
To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Lower Neches Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.
Economic:	N/A

Safety/Cautionary Notes
Shallow

Booming Strategy Recommendations

Recommendations:	Bring 200 feet of protective boom and set up at a 45º angle.		
Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	Not greater than 100 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #6,7,19;
Old River/Hickory Cove-Site #72

No Photograph Available

Site Information

Site 72 is a fairly wide inlet that curves North and eventually leads into the inlet on Site 70. Site 72 feeds a moderately sensitive marsh West of the Sabine River.

(b) (7)(F) [redacted]

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	10 minutes, 15 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Lower Neches Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority: **Medium**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp

Economic: N/A

Safety/Cautionary Notes

Shallow

Booming Strategy Recommendations

Recommendations: Bring 500 feet of protective boom and place at a 45º angle

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	Not greater than 300 ft

Site Specific Information
TGLO Response Atlas Map #5, Polygon #6,7,19;
Old River/Hickory Cove-Site #73

Site Information

Site 73 consists of several inlets located between Hickory Cove and the Sabine River. There are several small inlets and marsh islands within this site. The Hickory Cove side of Site 51 on the Sabine River is included in this Site (Site 73). The tide level will influence how much of this site could be affected if a spill threatens this area.

(b) (7)(F)

NOAA chart #	11342	**County:**	Orange
Near ICW Marker	N/A	**Date last visited:**	2/24/00

Access

Closest Boat Ramp:	Rainbow Marina, Port Neches Park
Distance:	10 minutes, 15 minutes
Boat type recommended:	Air boat only
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Lower Neches Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority: **Medium**

Environmental: Wetlands, habitat for wading birds, waterfowl, alligator, fish, crab and shrimp.

Economic: N/A

Safety/Cautionary Notes

Shallow, submerged objects not marked.

Booming Strategy Recommendations

Recommendations: Bring 1500 feet of protective boom in 100-foot sections. None of the 5 inlets are over 200 feet wide. Tide fluctuations will influence the booming strategies for these inlets.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	5 inlets not more than 200 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #16,25,25; Sabine Lake-Site #137

Site Information

Site 137 is Bridge Bayou. This site is a narrow inlet North of Willow Bayou (Site # 136) approximately 2 miles. This site is approximately 5 ½ miles from the tip of Coffee Ground Cove Peninsula. The water is shallow near this inlet.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Port Neches Park; Walter Umphrey State Park
Distance:	25 minutes; 30 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340

Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 Bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 100 feet of protective boom at a 45º angle or a "V" pattern.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	1-2 ft.	**Width of inlet:**	50 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #16,25,26; Sabine Lake-Site #138

Site Information

Site 138 is an unnamed inlet feeding into Sabine National Wildlife Refuge. It is located just North of Bridge Bayou (Site 137) on the Louisiana side of Sabine Lake. This site is approximately 5 miles from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F) [redacted]

Nearest ICW Marker: N/A **Date last visited:** 2/17/00

Access

Closest Boat Ramp:	Port Neches Park; Walter Umphrey State Park
Distance:	25 minutes; 32 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use two sections of 200 feet of protective boom in a "V" formation or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	60 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #15,21,24,25; Sabine Lake-Site #139

Site Information
Site #139 is an unnamed inlet feeding into Sabine National Wildlife Refuge. It is the second inlet North of Bridge Bayou (Site 137) on the Louisiana side of Sabine Lake. This site is approximately 4 ½ miles by water from the Causeway Bridge and 6 miles from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F) [redacted]

Nearest ICW Marker: N/A **Date last visited:** 2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	15 minutes; 25 minutes; 35 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur
To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King

(MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 200 ft. of protective boom in a “V” pattern or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	45 ft.

Specific Information
TGLO Response Atlas Map #5, Polygon #21,24,25; Sabine Lake-Site #140

Site Information

Site140 is Three Bayou. It is the third inlet North of Bridge Bayou (Site 137) and is located on the Louisiana side of Sabine Lake. Three Bayou feeds Sabine National Wildlife Refuge. This site is approximately 4 ¼ miles from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F) [redacted]

Nearest ICW Marker: N/A **Date last visited:** 2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	15 minutes; 23 minutes; 36 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel

approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety/Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 200 feet of protective boom in a "V" pattern or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	60 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #8,15,21,24,25; Sabine Lake-Site #141

Site Information

Site 141 is a small unnamed inlet just South of Whiskey Bayou (Site 142) on the Louisiana side of Sabine Lake. This site is approximately 4 miles from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	15 minutes; 20 minutes; 38 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 200 feet of protective boom in a “V” pattern or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	50 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #8,15,21,24; Sabine Lake-Site #142

Site Information

Site 142 is Whiskey Bayou. It is the second inlet North of Three Bayou (Site 140) and is located on the Louisiana side of Sabine Lake. This inlet feeds the Sabine National Wildlife Refuge. This site is approximately 3 ½ miles from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	15 minutes; 20 minutes; 40 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be

on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 400feet of protective boom in a ”V” pattern or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	240 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #8,15,21,24; Sabine Lake-Site #143

Site Information

Site 143 consists of two small inlets, located North of Whiskey Bayou. This site feeds into Sabine NWR. This site is approximately 3 ¼ miles from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	12 minutes; 18 minutes; 42 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be

on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 300 feet of protective boom in a "V" formation or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	70 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #8,15,21; Sabine Lake-Site #144

Site Information

Site 144 is an unnamed inlet that has a second inlet feeding off of it approximately ½ mile down from it's mouth on the North bank. This second inlet feeds directly into Sabine National Wildlife Refuge. This site is approximately 2 ½ miles by water from the tip of Coffee Ground Cove Peninsula. The Lake is shallow in areas.

(b) (7)(F) [redacted]

Nearest ICW Marker: N/A **Date last visited:** 2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	11 minutes; 15 minutes; 45 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel

approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations: Use 300 feet of protective boom in a "V" pattern or boom at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	75 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #8,15,21; Sabine Lake-Site #145

Site Information

Site 145 an unnamed inlet in the Northeast side of Coffee Ground Cove, which is located on the Louisiana side of Sabine Lake. This canal has the property of the John Gray Estate on the North and Sabine National Wildlife Reference to the South. This site is approximately 2 miles by water from the tip of Coffee Ground Cove Peninsula. The Lake can be shallow in areas.

(b) (7)(F) [redacted]

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Port Neches Park; Walter Umphrey State Park
Distance:	10 minutes; 15 minutes; 48 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be

on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**

Environmental: Highly sensitive habitat for fish, crab, shrimp, wading birds, and shore birds

Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge).

Booming Strategy Recommendations

Recommendations: Use 200 feet of protective boom in a "V" pattern or at a 45º angle.

Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	60 ft.

Site Specific Information
TGLO Response Atlas Map #5, Polygon #10; Sabine Lake-Site #146

Site Information

Site 146 is the second spoil culvert on the North Revetment/Levee Road on Pleasure Island. This site consists of three culverts that lay side by side and are surrounded by a metal walkway or pier. This site allows water to flow to and from Sabine Lake to the North Pleasure Island marsh. The metal structure surrounding the culverts has the ability to hold 2X6 boards to eliminate water exchange from Sabine Lake to the marsh. The metal pier is used by recreational fisherman year around. This site is accessible from the road by traveling Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East onto Hwy 82 East. Travel over the Martin Luther King Bridge and take a Right on TB Ellison Parkway. Travel past Pleasure Island Marina/Port Arthur Yacht Club. The road will come to a "T" intersection. Take a Left at the stop sign on the North Revetment/ Levee Road and travel approximately 4 ¾ miles. Site 146 will be located on the Left side of the road.

(b) (7)(F)

NOAA chart #	11342	**County**:	Jefferson
Near ICW Marker		**Date last visited**:	2/22/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Pleasure Island Music Park
Distance:	10 minutes; 15 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Marina/Port Arthur Yacht Club; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Pleasure Island Music Park's boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Travel approximately 1½ miles down and the Music Park is located on the Right side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **Medium**

Environmental: Habitat for birds, fish, and crabs.

Economic: Pleasure Island is widely used for recreational purposes, especially during summer months.

Safety/Cautionary Notes

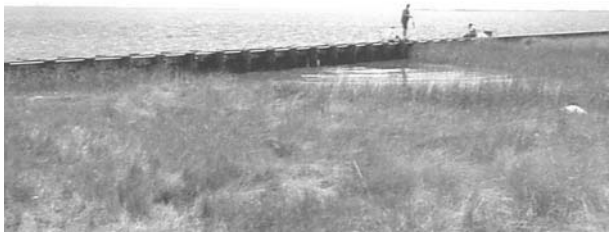
This spoil culvert is a popular spot for recreational fishermen. Sabine Lake is very shallow near the culvert.

Booming Strategy Recommendations

Recommendations: Damming off the 3 openings to this culvert with 2X6 boards placed into the slots provided on the metal structure and sorbent pads around the edges should insure that pollution does not enter this area.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #5, Polygon #10;
Sabine Lake-Site #147



Site Information

Site 147 is a break in the wooden sea wall just before the North Levee Road make a hard curve to the Right. This site allows water to flow to and from Sabine Lake to the small marsh just South of the North Pleasure Island marsh. This site is accessible from the road by traveling Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge and take a Right on TB Ellison Parkway. Travel past Pleasure Island Marina/Port Arthur Yacht Club. The road will come to a "T" intersection. Take a Left at the stop sign on the North Revetment/ Levee Road and travel approximately 4 miles. Site 147 will be located on the Right side of the road.

(b) (7)(F)

NOAA chart #	11342	**County**:	Jefferson
Near ICW Marker		**Date last visited**:	6/12/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Pleasure Island Music Park
Distance:	5 minutes; 10 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Marina/Port Arthur Yacht Club; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Pleasure Island Music Park's boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK)

Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Travel approximately 1½ miles down and the Music Park is located on the Right side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **Medium**

Environmental: Habitat for birds, fish, and crabs.

Economic: Pleasure Island is widely used for recreational purposes, especially during summer months.

Safety/Cautionary Notes

High volume of recreational traffic

Booming Strategy Recommendations

Recommendations: Damming off the opening in this wooden sea wall with plywood boards placed in front and back of the structure and sorbent pads around the edges should insure that pollution does not enter this area.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	2 ft. across

Site Specific Information
TGLO Response Atlas Map #6, Polygon #9,11,13; Neches River-Site #33

No Photograph Available

Site Information

Site 33 is the intake canal for Fina Oil and Chemical. This site is located on the West bank of the Neches River approximately ¾ of a mile North of the Rainbow Bridge. Fina Oil and Chemical should be notified if a spill threatens this area. The banks are high with clay substrate.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Rainbow Marina; Port Neches Park
Distance:	2 minutes; 10 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
Fina Oil & Chemical	(409) 962-4421
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Fina Oil & Chemical

Safety/ Cautionary Notes

Strong currents in this area

Booming Strategy Recommendation

Recommendation: In the event of a spill, contact Fina Oil & Chemical. Use 500 feet of protective boom at a 45º angle. A reel of boom is located at this site.

Number of personnel:	2-4	**Tidal Influence:**	High
Water depth at mouth:	25 ft.	**Width of inlet:**	348 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #6, Polygon #10,11,13; Neches River-Site #34

Site Information

Site 34 consists of two adjacent inlets that are located on the West bank of the Neches River. This site is approximately 1½ miles North of the Rainbow Bridge/Hwy 73. Star Canal/Acid Canal is the West inlet and Molasses Bayou is the East inlet. Star/Acid Canal leads to Associated Marine Services Inc. There is road access to this canal from Sarah Jane Rd. The banks of both inlets are lined with trees that may be used to anchor boom.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Rainbow Marina; Port Neches Park
Distance:	4 minutes; 6 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Associated Marine	(409) 962-0924

Resources at Risk

Atlas Priority: **Medium**
Environmental: Brackish marsh habitat for wading birds, shore birds, and waterfowl
Economic: Associated Marine Inc.

Safety/ Cautionary Notes

Strong currents are present in this area

Booming Strategy Recommendation

Recommendation:	Use 300 feet of protective boom at a 45º angle.		
Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	4 ft.	**Width of inlet:**	246 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #6, Polygon #1,4,5;
Neches River-Site #35

Site Information

Site 35 is the Entergy/GSU out-fall canal. This site is located on the East bank of the Neches River approximately 1 ¾ miles North of the Rainbow Bridge. This site consists of two inlets that are wide with brackish marsh shores. Power-lines run overhead.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	4/18/06

Access

Closest Boat Ramp:	Rainbow Marina; Port Neches Park
Distance:	4 minutes; 6 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Entergy/GSU	(409) 735-7191

Resources at Risk

Atlas Priority: Medium
Environmental: Brackish marsh habitat for wading birds, shore birds, and waterfowl
Economic: Entergy/GSU

Safety/ Cautionary Notes

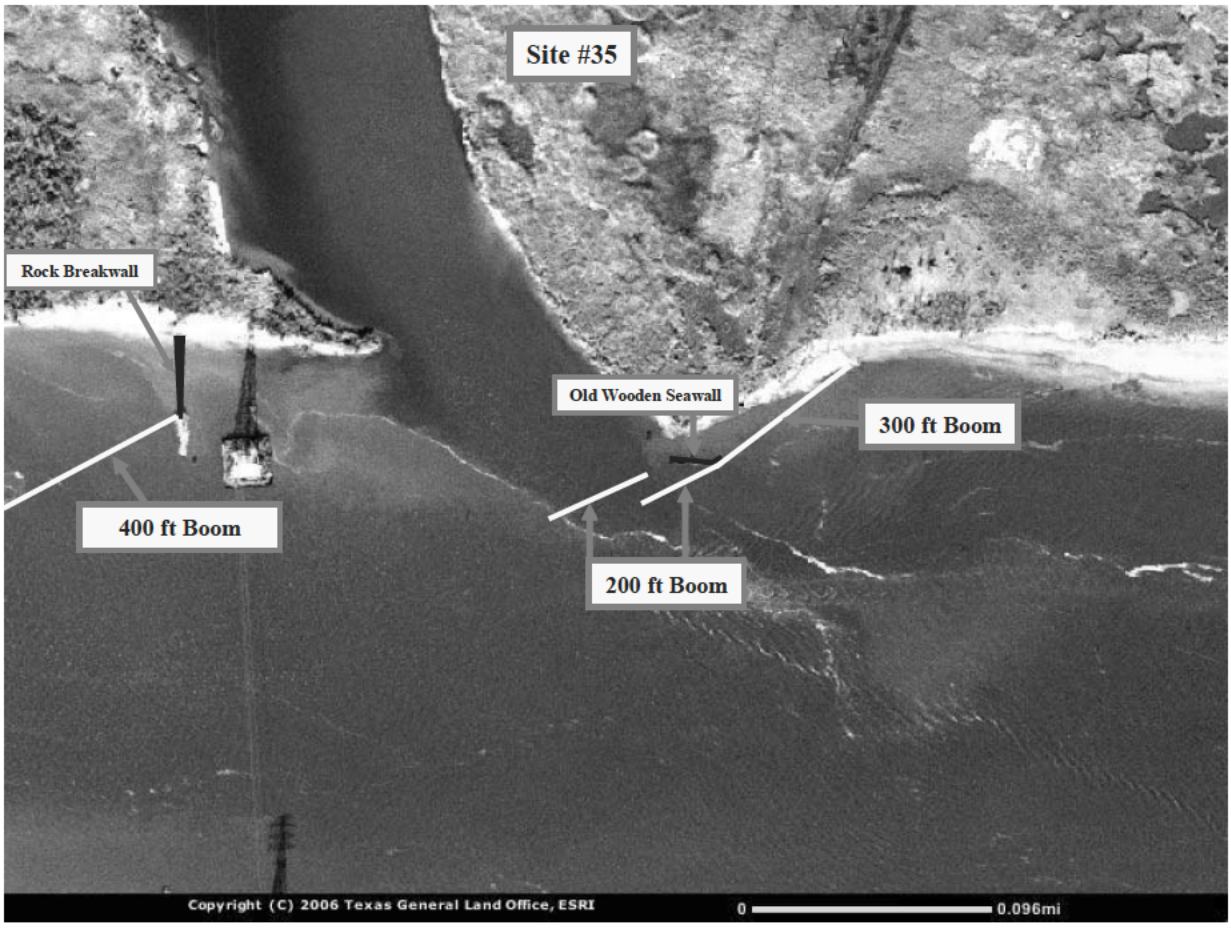
Strong currents present in this area

Booming Strategy Recommendation

Recommendation: Refer to the picture below for booming strategy. This can also be used as a collection point on the north and south side of the inlet.

Number of personnel: 6-8
Tidal Influence: Medium
Water depth at mouth: 18 ft.
Width of inlet: 528 ft. and 488 ft. at a 45° angle

Equipment:
1100 ft of 18" Boom
2 Boats
(3) 30-lb minimum anchors
Prefer 6 tow bridles
3 anchoring systems
4 stakes (with means of pounding stakes)



Site Specific Information

TGLO Response Atlas Map#6, Polygon #1,4; Neches River-Site #36

Site Information

Site 36 is a small inlet located at the far side of the Fina Anchorage. The first entrance to the Fina Anchorage is located on the East bank of the Neches River approximately 2 ¼ miles North of the Rainbow Bridge. This site is located nearly ½ of a mile inside the Fina Anchorage on the East bank. This inlet feeds a sensitive marsh North of the Anchorage.

(b) (7)(F)

	11343		Orange
Nearest ICW marker:	N/A	**Date last visited:**	8/16/05

Access

Closest Boat Ramp:	Rainbow Marina; Port Neches Park
Distance:	5 minutes; 3 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Rainbow Marina you would take Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East, to the Right, immediately before you reach the Veteran's Memorial Bridge. Travel underneath the Veteran's Memorial Bridge. Rainbow Marina is located near the base of the Rainbow Bridge on Hwy 73 West.

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: High

Environmental: Brackish marsh habitat for river otter, wading birds, shore birds, and waterfowl, fish and crabs

Economic: Commercial traffic uses this area frequently

Safety/ Cautionary Notes

Strong currents are present in this area

Booming Strategy Recommendation

Recommendation: Use 200 feet of protective boom using a chevron configuration. Trees on the shore can be used for anchor points. Refer to the picture below for booming strategy.

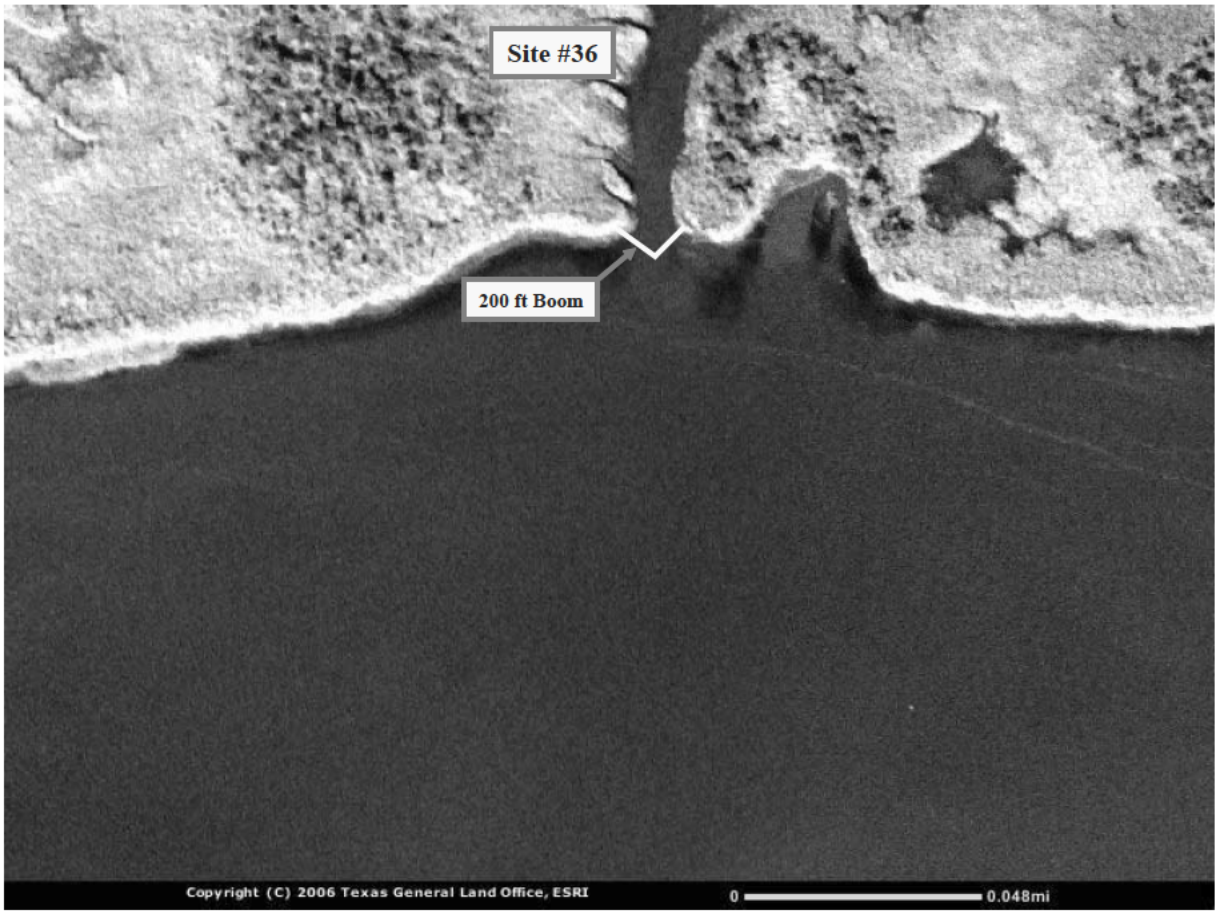
Number of personnel: 4-6

Tidal Influence: Medium

Water depth at mouth: 10 ft.

Width of inlet: 60 ft. at a 45° angle

Equipment recommended:
200 ft of 18" boom
2 boats
4 stakes for anchoring (with means of pounding stakes)
20-lb anchor
50-60 ft of anchor line
Anchor buoy



Site Specific Information

TGLO Response Atlas Map #6, Polygon #1,3,4; Neches River-Site #37



Site Information

Site 37 consists of three small inlets located on the Northwest bank of the Fina Anchorage. The second entrance to the Fina Anchorage is located on the East bank of the Neches River approximately 3 ¼ miles North of the Rainbow Bridge. This site is located just inside the Fina Anchorage on the Northwest bank. The water depth drops quickly near the shore. These inlets may be difficult to recognize during high tides.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	3/08/06

Access

Closest Boat Ramp:	Port Neches Park
Distance:	2 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: High

Environmental: Brackish marsh habitat for river otter, wading birds, shore birds, and waterfowl, fish and crab

Economic: Commercial traffic uses this area frequently

Safety/ Cautionary Notes

Shallow near shore, strong currents are present in this area

Booming Strategy Recommendation

Recommendation: Booming off the inlets may be difficult. It may be better to do a cascade system in the river to keep the oil out of the oxbow. Refer to the picture below for booming strategy.

Number of personnel: 8-10

Tidal Influence: Medium

Water depth at mouth: 7 ft.

Width of inlet: 150 ft., 690 ft., 342 ft.

Equipment recommended:
2100 ft of 18" boom
2 boats
6 stakes for anchoring (with means for pounding stakes)
3 anchoring systems
Tow bridles as needed

Site Specific Information
TGLO Response Atlas Map #6, Polygon #N/A;
Neches River-Site #38

Site Information

Site 38 is the intake point for Motiva Enterprises. This site is located on the West bank of the Neches River approximately 4 miles North of the Rainbow Bridge. In the event of a spill, Motiva should be notified. There is a boom reel located next to the intake.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	2 minutes
Boat type recommended:	John boat only.
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers	USCG MSU Port Arthur	(409) 723-6500
	TGLO-via hotline	(800) 832-8224
	Motiva Enterprises	(409) 989-7108
	TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Motiva Enterprises

Safety/ Cautionary Notes

Commercial traffic in area

Booming Strategy Recommendation

Recommendation: Boom on site, notify Motiva Enterprises if a spill threatens this area

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	7 ft.	**Width of inlet:**	90 ft. across

Site Specific Information
TGLO Response Atlas Map #6, Polygon #11,13; Neches River-Site #39

No Photograph Available

Site Information

Site 39 is the intake point for the Huntsman Corporation C-4 docks. The intake is located just South of Port Neches Park on the Neches River and easily accessed by from Grigsby Street in Port Neches. The intake has a concrete barrier in place, but Huntsman should be notified if a spill threatens this area.

(b) (7)(F)

NOAA chart #	11343	**County:**	Orange
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	1 minute
Boat type recommended:	Acceptable for most small craft.
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
Huntsman Main Gate	(409) 989-6536
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority:	**Not rated at this time. Site may require attention.**
Environmental:	N/A
Economic:	Huntsman Corporation

Safety/ Cautionary Notes
Strong tidal flow; check tides

Booming Strategy Recommendation

Recommendation:	Notify Huntsman		
Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	35 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #6, Polygon #4; Neches River-Site #40

Site Information

Site 40 is Block Bayou, which consists of two inlets that merge into one. The two inlets are located approximately ½ mile North of Port Neches Park on the West bank of the Neches River. These inlets have road access from Mobil's tank farm property and from Block Street within the residential area in Port Neches. The shores of both inlets of Block Bayou are wooded with sloping banks. The small island that is formed from the two inlets merging is susceptible to inundation during high tidal cycles.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/1/00

Access

Closest Boat Ramp:	Port Neches Park
Distance:	2 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Jefferson County Airport

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Mobil Corporation	(409) 839-1291

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Brackish marsh habitat for wading birds
Economic: Residential area, commercial traffic in the river, Mobil Corp.

Safety/ Cautionary Notes

Shallow, submerged objects

Booming Strategy Recommendation

Recommendation: Use two sections of protective boom at a 45º angle, 200 and 400 feet. Vacuum trucks have access from Mobil Corp.'s tank farm and the residential Block Street in Port Neches.

Number of personnel:	2-4	**Tidal Influence:**	Medium
Water depth at mouth:	2 ft	**Width of inlet:**	150 ft., 324 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #6, Polygon #10,12,17,18; Sabine Lake-Site #148

Site Information

Site 148 is the first spoil culvert on the North Revetment/Levee Road on Pleasure Island. This site consists of three culverts that lay side by side and are surrounded by a metal walkway or pier. This site allows water to flow to and from Sabine Lake to the North Pleasure Island marsh. The metal structure surrounding the culverts has the ability to hold 2X6 boards to eliminate water exchange from Sabine Lake to the marsh. The metal pier is used by recreational fisherman year around. This site is accessible from the road by traveling Hwy 69/96 South to Hwy 73 East. Exit off Hwy 73 East onto Hwy 82 East. Travel over the Martin Luther King Bridge and take a Right on TB Ellison Parkway. Travel past Pleasure Island Marina/Port Arthur Yacht Club. The road will come to a "T" intersection. Take a Left at the stop sign on the North Revetment/ Levee Road and travel approximately 1 mile. Site 153 will be located on the Left side of the road.

(b) (7)(F)

NOAA chart #	11342	**County**:	Jefferson
Near ICW Marker #		**Date last visited**:	2/22/00

Access

Closest Boat Ramp:	Pleasure Island Marina/Port Arthur Yacht Club; Pleasure Island Music Park
Distance:	4 minutes; 6 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Marina/Port Arthur Yacht Club; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina/Port Arthur Yacht Club boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Continue straight through the 4-way stop sign. The Yacht Club and Marina is located to the right, just after the stop sign. Continue straight to reach the boat launch. The road will come

to a "T" intersection. Take a Right at the stop sign and the Pleasure Island Marina/Port Arthur Yacht Club boat launch is located at the end of the road.

To reach Pleasure Island Music Park's boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign onto TB Ellison Parkway. Travel approximately 1½ miles down and the Music Park is located on the Right side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **Medium**

Environmental: Habitat for birds, fish, and crabs.

Economic: Pleasure Island is widely used for recreational purposes, especially during summer months.

Safety/Cautionary Notes

This spoil culvert is a popular spot for recreational fishermen. Sabine Lake is very shallow near the culvert.

Booming Strategy Recommendations

Recommendations: Damming off the 3 openings to this culvert with 2X6 boards placed into the slots provided on the metal structure and sorbent pads around the edges should insure that pollution does not enter this area.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #9, Polygon #1; Sabine-Neches Canal-Site #74

No Photograph available

Site Information

Site 74 is a culvert located on the East bank of the Sabine-Neches Canal, approximately 1mile North of the Martin Luther King (MLK) Bridge. This culvert is almost directly across from the Port of Port Arthur. Site 74 runs under TB Ellison Parkway on Pleasure Island. This culvert allows water to flow to and from the Sabine-Neches Canal to the South Pleasure Island marsh. This culvert can be seen on either side of the road and should be protected on both sides. This culvert feeds a ditch that runs parallel with the South Revetment/Levee Road.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	285	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; West Port Arthur/ICWW Bridge
Distance:	25 minutes; 15 minutes
Boat type recommended:	Suitable for most small craft
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass; Pleasure Island Music Park

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via Hotline	(800) 832-8224
Pleasure Island Commission	(409) 982-4675
Port Arthur Fire Dept	(409) 983-8700
Port Arthur Police	(409) 983-8600
Corps of Engineers	(409) 985-4383
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388

Pin # 129-340

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Habitat for birds, fish, and crabs
Economic: Pleasure Island is widely used for recreational purposes, especially during summer months.

Safety/Cautionary Notes

High volume of commercial vessel traffic in the Sabine Neches Canal. High volume of vehicle traffic on TB Ellison Parkway.

Booming Strategy Recommendations

Recommendations: Damming off both openings to this culvert with plywood, held in place with stakes, and sorbent pads around edges should insure that pollution does not enter this area. The culvert pipe is approximately 36 inches in diameter.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	36 inches

Site Specific Information
TGLO Response Atlas Map #9, Polygon #1; Sabine-Neches Canal-Site # 75

Site Information

Site 75 is the entrance to Taylor Bayou Turning Basin and Texaco Island. This channel leads to several industrial docks. This area has a high potential for spills. Closing this intersection of the ICWW, Sabine-Neches Canal and the Port Arthur Canal/Ship Channel to traffic would be costly for all parties involved. This area has road access through Clark Refinery and Texaco Island.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	288	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	Port Neches Park; West Port Arthur/ICWW Bridge
Distance:	30 minutes; 10 minutes
Boat type recommended:	Suitable for most small craft
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass; Pleasure Island Music Park

Directions from MSU Port Arthur

To reach Port Neches Park you would take Hwy 365 toward Port Neches. Take a Right on Hwy 366 and continue down to the first red light, which is Merriman. Take a Left on Merriman. Travel past Port Neches High School. The park is located at the end of Merriman.

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Industrial park, docks and vessel traffic

Safety/ Cautionary Notes

Commercial vessel traffic

Booming Strategy Recommendation

Recommendation: Use 800 feet of boom at a 45º angle. This site is most easily accessed from the road on Texaco Island, but a boat would be needed to deploy boom across the channel.

Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	30 ft.	**Width of inlet:**	750 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #9, Polygon #1; Intra-Coastal Waterway (ICWW)-Site # 76

Site Information

Site 76 consists of two separate inlets located on the East (South) bank of the ICWW. The first inlet is immediately adjacent to the West of the West Port Arthur/ICWW Bridge. The second inlet is approximately ¼ of a mile West of the West Port Arthur/ICWW Bridge. This second inlet flows South for a short distance and the curves East toward Hwy 87. Tugboats, towboats, and barges often moor near this location in order to refuel. The potential is high for a spill to occur near this site.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	290	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	Adjacent
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Music Park; Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
J. D. Murphree Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority:	**Not rated at this time. Site may require attention.**
Environmental:	A bird rookery is located across the ICWW from this site, JD Murphree Wildlife Refuge is to the West
Economic:	Tugboats, towboats, and barges often moor near this location in order to refuel

Safety/ Cautionary Notes

Commercial vessel traffic

Booming Strategy Recommendation

Recommendation:	Use 200 feet and 300 feet of protective boom at a 45º angle		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	117 ft. and 267 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #9, Polygon #1,7,11;
Intra-Coastal Waterway (ICWW)-Site # 77

Site Information

Site 77 is Taylor Bayou, which is located on the West (North) bank of the ICWW. This site is approximately 1 ½ miles West of the West Port Arthur/ICWW Bridge. The steep clay banks consist of intermediate marsh flora and fauna.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	291	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	5 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Music Park; Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
J. D. Murphree Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	JD Murphree Wildlife Refuge is to the West
Economic:	Tugboats, towboats, and barges often moor near this location in order to refuel

Safety/ Cautionary Notes
Commercial vessel traffic

Booming Strategy Recommendation:

Recommendation:	Use 1000 feet of protective boom at a 45º angle. Stakes may be needed to anchor boom.		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	13 ft.	**Width of inlet:**	570 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #9; Polygon #1,11;
Intra-Coastal Waterway (ICWW)-Site #78

Site Information

Site 78 is an inlet that feeds into J. D. Murphree Wildlife Management Area. This site is located on the North bank of the ICWW and is approximately 2 miles West of the West Port Arthur/ICWW Bridge.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	290	**Date last visited:**	2/10/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	5 minutes
Boat type recommended:	Small craft, steel hull recommended.
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
J. D. Murphree Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	Habitat for fish, crab, and shrimp.
Economic:	Commercial traffic

Safety/ Cautionary Notes

Shallow, reptiles in area

Booming Strategy Recommendation

Recommendation:	Use 150 feet of protective boom at a 45º angle.		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	60 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #9, Polygon #1,7;
Taylor Bayou-Site #96

Site Information

Site 96 consists of five inlets that are located on the West bank of Taylor Bayou. These inlets feed into the canals surrounding J.D. Murphree Wildlife Management Area, which is a highly sensitive habitat. These inlets are located approximately 15 feet from the ICWW to just before the Taylor Bayou Outfall Canal (Site 57), which is just under 1 mile distance.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:		**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	5 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Music Park; Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority: **Medium**
Environmental: JD Murphree Wildlife Mgmt Area
Economic: N/A

Safety/ Cautionary Notes

Shallow near bank

Booming Strategy Recommendation

Recommendation: Use 200 feet and 200 feet of protective boom at a 45º angle for each inlet. Stakes may be needed to anchor boom.

Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	3 ft.	**Width of inlet:**	138 ft and 127 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map# 9, Polygon #3;
Taylor Bayou-Site #98

No Photograph Available

Site Information

Site 98 consists of two inlets that are located on the East and West banks of Taylor Bayou. These inlets are approximately 1 ½ miles from the ICWW. The inlet on the West bank leads into the Taylor Bayou Outfall Canal (Site 97). The second inlet, on the East bank, dead ends shortly after it's mouth.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	15 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	Intermediate marsh habitat
Economic:	N/A

Safety/ Cautionary Notes
Shallow near bank

Booming Strategy Recommendation

Recommendation:	Use 200 feet and 100 feet of protective boom at a 45º angle. Stakes may be needed to anchor boom.		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	13 ft.	**Width of inlet:**	98 ft. and 69 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #9, Polygon #1;
Taylor Bayou-Site #99

No Photograph Available

Site Information

Site 99 is a very small inlet located on the East bank of Taylor Bayou. This inlet is approximately 1 ¾ miles from the ICWW. This inlet leads to a shallow pond on the East side of Taylor Bayou. There is no road access to this site.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	1/27/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	15 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551

Resources at Risk

Atlas Priority:	**Not rated at this time. Area may require attention.**
Environmental:	Intermediate marsh habitat
Economic:	N/A

Safety/ Cautionary Notes

Shallow near bank

Booming Strategy Recommendation

Recommendation:	Use 100 feet of protective boom at a 45º angle. Stakes may be needed to anchor boom.		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	4 ft.	Width of inlet:	77 ft.

Site Specific Information
TGLO Response Atlas Map #9, Polygon #3,22;
Taylor Bayou-Site #100

Site Information

Site 100 is the outfall for Jefferson County Drainage Ditch # 7 located on East bank of Taylor Bayou approximately 3 ½ miles North of the ICWW. The outfall is labeled Pump House #16 and known as Alligator Pump Station. Travelling South on Taylor Bayou from the Hwy 73 Bridge, you will have to pass through the Navigation District's saltwater locks. The number is listed below. It is highly encouraged that personnel contact these numbers before responding to a spill in this area.

(b) (7)(F) [redacted]

Nearest ICW marker: N/A **Date last visited:** 2/08/00

Access

Closest Boat Ramp:	Taylor Bayou/Hwy 73 Bridge; West Port Arthur/ICWW Bridge
Distance:	30 minutes, 10 minutes
Boat type recommended:	Small craft for easier launch
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the Taylor Bayou/Hwy 73 Bridge you would take Hwy 69/96 South to Hwy 73 West. Continue on Hwy 73 West until you reach Taylor Bayou. Exit to the Right immediately before the bridge. The boat launch is located under the Taylor Bayou/Hwy 73 Bridge.

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Navigation District	(409) 866-8368
Lockmasters: Merril Pickenpaw	(409) 982-3129
	(409) 893-1767
Juan Bootie	(409) 983-6553
	(409) 893-1826

Resources at Risk

Atlas Priority: **Low**
Environmental: Habitat for crab, shrimp, pelican
Economic: DD7 Canal

Safety/ Cautionary Notes

Shallow near bank, commercial traffic area

Booming Strategy Recommendation

Recommendation: Inform Drainage District 7 if a spill threatens this area.

Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	12 ft.	**Width of inlet:**	190 ft at 45° angle

Site Specific Information
TGLO Response Atlas Map #9, Polygon #3,22;
Taylor Bayou-Site #101

Site Information

Site 101 consists of two saltwater barriers and a saltwater intrusion lock system located on Taylor Bayou approximately 4 miles North of the ICWW. The Bayou makes a sharp curve to the West and the locks are located just past this point. Jefferson County Navigation District operates the locks. Personnel reside on site. The lockmaster or his assistant can be reached at the numbers listed below if the locks need to be opened. The locks are accessible by road. You would take Hwy 69/96 South to Hwy 73 West. Follow Hwy 73 West to Cambridge Street in Port Acres. Turn Left on Cambridge St. Travel on Cambridge St. until it runs into the levee. Pass through the gates and turn Left on the levee road. You will be able to see the locks from the levee on the right-hand side approximately 1¼ miles down.

(b) (7)(F)

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/08/00

Access

Closest Boat Ramp:	Taylor Bayou/Hwy 73 Bridge; West Port Arthur/ICWW Bridge
Distance:	30 minutes, 10 minutes
Boat type recommended:	Small craft for easier launch
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass.

Directions from MSU Port Arthur

To reach the Taylor Bayou/Hwy 73 Bridge you would take Hwy 69/96 South to Hwy 73 West. Continue on Hwy 73 West until you reach Taylor Bayou. Exit to the Right immediately before the bridge. The boat launch is located under the Taylor Bayou/Hwy 73 Bridge.

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(409) 736-2551
Navigation District	(409) 866-8368
Lockmasters: Merril Pickenpaw	(409) 982-3129
	(409) 893-1767
Juan Bootie	(409) 983-6553
	(409) 893-1826

Resources at Risk

Atlas Priority: **Low**
Environmental: Habitat for crab, shrimp
Economic: Jefferson County

Safety/ Cautionary Notes

Swift currents are present when the locks are opened.

Booming Strategy Recommendation

Recommendation: Inform the Navigation District in the event of a spill. The inlet can be boomed to the North of the locks by using 800 feet of protective boom in a "V" pattern or a 45º angle. The locks also form a natural collection point. Road access is available for a vacuum truck to utilize.

Number of personnel:	2	**Tidal Influence:**	High
Water depth at mouth:	12 ft.	**Width of inlet:**	366 ft. at 45° angle

Site Specific Information
TGLO Response Atlas Map #9; Polygon #1,12,18;
Port Arthur Canal/Ship Channel-Site #113

Site Information

Site 113 consists of a wide cove with a culvert that runs underneath Hwy 87. This culvert feeds into the ditch that runs parallel with Hwy 87 on the West side. This site is located approximately 1 mile South of the West Port Arthur/ICWW Bridge on the Port Arthur Canal/Ship Channel. The road access from Hwy 87 makes this site a good collection point. The culvert would have to be dammed off with plywood before using this site as a collection point.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/15/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	5 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
J.D. Murphree Wildlife Management Area	(409) 736-2551
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700

Resources at Risk

Atlas Priority:	**Medium**
Environmental:	Habitat for wading birds
Economic:	Commercial in the Port Arthur Canal/Ship Channel

Safety/ Cautionary Notes

High volume of vehicle traffic on Hwy 87

Booming Strategy Recommendation

Recommendation:	This cove would make a good collection point as long as the culvert is dammed off first. You would need plywood, stakes to hold it in place, and sorbent pads around the edges to insure the pollution does not flow through the culvert. If this site is not used as a collection point, 1000 feet of protective boom will be needed at a 45º angle or "V" pattern.		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	5 ft.	**Width of inlet:**	630 ft. at a 45º angle

Site Specific Information
TGLO Response Atlas Map #9; Polygon #1,12,13;
Port Arthur Canal/Ship Channel-Site #114

Site Information

Site 114 is a culvert that runs underneath Hwy 87 and is located approximately 1½ miles South of the West Port Arthur/ICWW Bridge on the Port Arthur Canal/Ship Channel. This culvert feeds into a ditch that runs parallel to Hwy 87. During extreme high tides the water flowing through this culvert could influence the marsh near Round Lake.

(b) (7)(F) [redacted]

NOAA chart #	11343	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/15/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	7 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
J.D. Murphree Wildlife Management Area	(409) 736-2551
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700

Resources at Risk

Atlas Priority: Low

Environmental: This site could influence Round Lake, which is of medium priority and is part of the J.D. Murphree Wildlife Management Area.

Economic: Commercial in the Port Arthur Canal/Ship Channel

Safety/ Cautionary Notes

High volume of vehicle traffic on Hwy 87

Booming Strategy Recommendation

Recommendation: This culvert should be dammed off using plywood, stakes to hold it in place, and sorbent pads around the edges to insure the pollution does not flow through the culvert. 100 feet of protective boom could be used in a "V" pattern if plywood was not available.

Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	1 ft.	**Width of inlet:**	5 ft. across

Site Specific Information
TGLO Response Atlas Map #9; Polygon #16;
Port Arthur Canal/Ship Channel-Site #115

Site Information

Site 115 is Keith Lake Cut. This site is located 3 ½ miles South of the West Port Arthur/ICWW Bridge on Hwy 87 and the Port Arthur Canal/Ship Channel. This cut leads into Keith Lake, which is a highly sensitive brackish marsh habitat for various species of flora and fauna. The Keith Lake ecosystem is extensive and valuable to this area. There are many inlets and bayous extending from this one major Cut and Lake. It would be extremely difficult to clean oil out of this marsh. It is imperative that oil is not allowed to enter this Cut.

(b) (7)(F)

NOAA chart #	11342	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	6/16/05

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	10 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700

Resources at Risk

Atlas Priority: **High**

Environmental: This is a salt/brackish water marsh habitat for fish, shrimp, crab and oyster, waterfowl, wading birds.

Economic: This area is a popular site among recreational fishermen.

Safety/ Cautionary Notes

Extreme currents are present during tidal changes. Vehicle traffic on Hwy 87 should be noted

Booming Strategy Recommendation

Recommendation: Keith Lake Cut has extreme currents flowing during tidal changes. This site is high priority for protection, however it may be difficult due to the currents. Refer to the picture below for booming strategy.

Number of personnel: 6-8 **Tidal Influence:** Medium

Water depth at mouth: 20 ft.+ **Width of inlet:** 660 ft.

Equipment Recommended: 1100 ft of 18" boom
2 boats
6 stakes (with means of pounding stakes)
Tow bridles as needed
Anchor line as needed

Site Specific Information

TGLO Response Atlas Map #9, Polygon #1,14; Port Arthur Canal/Ship Channel-Site #116

Site Information

Site 116 is a culvert that runs under Hwy 82 on Pleasure Island. This culvert is located approximately 5 ½ miles South of the Martin Luther King Bridge on Hwy 82. This culvert allows water to flow to and from the Port Arthur Canal/Ship Channel to the South Pleasure Island marsh. This culvert can be seen on either side of Hwy 82 and should be protected on both sides. This culvert feeds a ditch that runs parallel to the South Revetment/Levee Rd. This site is located directly across the Port Arthur Canal/Ship Channel from Keith Lake Cut (Site 115).

(b) (7)(F) [redacted]

Near ICW Marker: **Date last visited:** 2/22/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	10 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot with local/state law enforcement coordination. Alternate location would be Sabine Pass.

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
TX Parks & Wildlife	(713) 649-0708
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Pleasure Island Commission	(409) 982-4675

Port Arthur Fire Dept	(409) 983-8700
Port Arthur Police	(409) 983-8600
Corps of Engineers	(409) 985-4383

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: Habitat for birds, fish, and crabs.
Economic: Pleasure Island is widely used for recreational purposes, especially during summer months.

Safety/Cautionary Notes

High volume of commercial vessel traffic in the Port Arthur Canal/Ship Channel. High volume of vehicle traffic on Hwy 82.

Booming Strategy Recommendations

Recommendations: Damming off both openings to this culvert with plywood, held in place with stakes, and sorbent pads around edges should insure that pollution does not enter this area. The culvert pipe is approximately 36 inches in diameter.

Number of personnel:	2	**Tidal influence:**	Medium
Water depth:	2 ft.	**Width of inlet:**	36 inches

Site Specific Information
TGLO Response Atlas Map #9; Polygon #1,8,16;
Port Arthur Canal/Ship Channel-Site #117

Site Information

Site 117 is a small cove immediately North of Friede-Goldman Central Yard on the Port Arthur Canal/Ship Channel. This cove is 3 ¾ miles South of the West Port Arthur/ICWW Bridge off of Hwy 87. This site could be used as a collection point. Road access to this area is through Friede-Goldman's Central Yard. Friede-Goldman's property could also be used as a staging area with their permission.

(b) (7)(F) [redacted]

NOAA chart #	11342	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/15/00

Access

Closest Boat Ramp:	West Port Arthur/ICWW Bridge
Distance:	15 minutes
Boat type recommended:	Small, medium
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Sabine Pass

Directions from MSU Port Arthur

To reach the West Port Arthur/ICWW Bridge you would take Hwy 69/96 South to Hwy 73 West. Exit onto Hwy 82 South. Travel on Hwy 82 South to Hwy 87 South. Continue on Hwy 87 South until you reach the ICWW. The boat launch is located on the North side of the West Port Arthur/ICWW Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Friede-Goldman Central Yard	(409) 971-2126
J.D. Murphree Wildlife Management Area	(409) 736-2551

Resources at Risk

Atlas Priority:	**Low**
Environmental:	Habitat for waterfowl, fish, shrimp, crab and oyster
Economic:	Friede-Goldman Central Yard

Safety/ Cautionary Notes

High volume of traffic on Hwy 87

Booming Strategy Recommendation

Recommendation:	This site is a good collection point. Friede-Goldman could be used as a staging area with permission from them.		
Number of personnel:	2	**Tidal Influence:**	Medium
Water depth at mouth:	22 ft.	**Width of inlet:**	780 ft.

Site Specific Information
TGLO Response Atlas Map #9; Polygon #9,16,19,20;
Sabine Lake-Site #124

Site Information

Site 124 is Walter Umphrey State Park. This Park is operated by the Texas Parks and Wildlife Department and is located on the Southern end of Pleasure Island. The Park is large enough to serve as a staging area. During summer months there is a high volume of recreational traffic. Directions to the park are listed below.

(b) (7)(F) [redacted]

Nearest ICW marker: N/A **Date last visited:** 2/15/00

Access

Closest Boat Ramp:	On site
Distance:	On site
Boat type recommended:	Suitable for most craft
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700

Sabine National
Wildlife Refuge (337) 762-3816

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Large volume of recreational traffic especially in the summer months

Safety/ Cautionary Notes

Consider traffic on the highway. Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendation

Recommendation: The park is a possible staging area. The park is on a point and boom would most likely not be practical, however vacuum trucks would have good access to the water.

Number of personnel:	2	**Tidal Influence:**	High
Water depth at mouth:	10 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #9; Polygon #10;
Sabine Lake-Site #125

Site Information

Site 125 is the Pleasure Island Music Park boat launch. The canal that flows from this launch to Sabine Lake is shallow at times. Check depth before launching. The Music Park grounds are large enough to support a helicopter landing. This site would be an excellent staging area considering the road access, boat launch, and large amount of land.

(b) (7)(F)

NOAA chart #	11342	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/15/00

Access

Closest Boat Ramp:	On site
Distance:	On site
Boat type recommended:	Suitable for most craft
Closest Airport:	Jefferson County
Closest Helicopter Landing:	On site

Directions from MSU Port Arthur

To reach Pleasure Island Music Park boat launch you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign after the MLK Bridge. Travel approximately 1 mile on TB Ellison Pkwy and the Music Park and boat launch will be on the Right-hand side.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **Not rated at this time. Site may require attention.**
Environmental: N/A
Economic: Large volume of recreational traffic especially in the summer months.

Safety/ Cautionary Notes

Canal from boat launch is shallow at times. Check depth. Recreational visitors are common to this area.

Booming Strategy Recommendation

Recommendation: 300 ft. of protective boom at a 45º angle or ”V” pattern will be adequate to protect this boat launch if necessary.

Number of personnel:	2	**Tidal Influence:**	High
Water depth at mouth:	5 ft.	**Width of inlet:**	N/A

Site Specific Information
TGLO Response Atlas Map #9; Polygon #10;
Sabine Lake-Site #126



Site Information

Site 126 is the entrance to Pleasure Island Marina (Port Arthur Yacht Club). A concrete wall, with an opening of 150 feet protects the Marina. This opening serves as the entrance. The Marina is located approximately 1½ miles North of the MLK Bridge on TB Ellison Pkwy.

(b) (7)(F) [redacted]

NOAA chart #	11342	**County:**	Jefferson
Nearest ICW marker:	N/A	**Date last visited:**	2/15/00

Access

Closest Boat Ramp:	On site
Distance:	On site
Boat type recommended:	Suitable for most craft
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Pleasure Island Music Park; Sabine Pass

Directions from MSU Port Arthur

To reach Pleasure Island Marina (Port Arthur Yacht Club) you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Right at the stop sign after the MLK Bridge. Travel approximately 1½ miles on TB Ellison Pkwy and the Marina is on the Right-hand side of the road.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority:	**Not rated at this time. Site may require attention.**
Environmental:	N/A
Economic:	Large volume of recreational traffic especially in the summer months. Expensive homes and businesses are on the waterfront.

Safety/ Cautionary Notes

Consider recreational boat traffic. Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendation

Recommendation:	Possible staging area. To protect the Marina, 300 feet of boom could be stretched across the entrance of the concrete seawall.		
Number of personnel:	2	**Tidal Influence:**	High
Water depth at mouth:	15 ft.	**Width of inlet:**	150 ft. across

Site Specific Information
TGLO Response Atlas Map #9, Polygon #20,21; Sabine Lake-Site #127

Site Information

Site 127 is Big Four Bayou. This site is the first inlet East of Blue Buck Point, located on the Louisiana side of Sabine Lake. This inlet is approximately 3 ¾ miles by water from the Causeway Bridge. This site does not have road access. The depth of the water is 1-2 feet at the mouth.

(b) (7)(F) [redacted]

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Walter Umphrey State Park
Distance:	7 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Number

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**
Environmental: Highly sensitive habitat for oysters, waterfowl, birds and brackish marsh
Economic: Large recreational use especially in summer months

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations:	Use 600 feet of protective boom in a "V" pattern.		
Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	270 ft.

Site Specific Information
TGLO Response Atlas Map #9, Polygon #20,21;
Sabine Lake-Site #128

Site Information

Site #128 is a narrow inlet, West of Garrison's Ridge. This site is located on the Louisiana side of Sabine Lake approximately 4 ¼ miles by water from the Causeway Bridge. This site does not have road access. The water depth is 1-2 feet at the mouth.

(b) (7)(F)

NOAA chart #:	11342	**County:**	Cameron Parish
Nearest ICW Marker:	N/A	**Date last visited:**	2/17/00

Access

Closest Boat Ramp:	Walter Umphrey State Park
Distance:	10 minutes
Boat type recommended:	Shallow, Aluminum hull
Closest Airport:	Jefferson County
Closest Helicopter Landing:	Walter Umphrey State Park parking lot; Sabine Pass

Directions from MSU Port Arthur

To reach Walter Umphrey State Park you would take Hwy 69/96 South to Hwy 73 West. Exit off of Hwy 73 West onto Hwy 82 South then to Hwy 82 East. Travel over the Martin Luther King (MLK) Bridge to Pleasure Island. Take a Left at the stop sign after the MLK Bridge. Travel approximately 7 miles on Hwy 82 East and Walter Umphrey State Park and Boat Launch will be on the Right hand side before the Causeway Bridge. There is a second launch site on the Left-hand side of Hwy 82 before the Causeway Bridge.

Trustees/ Contact Numbers

USCG MSU Port Arthur	(409) 723-6500
TXGLO-via hotline	(800) 832-8224
Pleasure Island Commission	(409) 985-4385
LA State Police	(225) 925-6595
LOSCO-via rotating pager	(800) 538-5388 Pin # 129-340
Port Arthur Police	(409) 983-8600
Port Arthur Fire	(409) 983-8700
Sabine National Wildlife Refuge	(337) 762-3816

Resources at Risk

Atlas Priority: **High**
Environmental: Highly sensitive habitat for oysters, waterfowl, birds and marsh grass.
Economic: Large recreational use especially in summer months.

Safety / Cautionary Notes

Sabine Lake can be rough and have strong currents at times, especially near the Hwy 82 bridge (Causeway Bridge). Shallow in some areas.

Booming Strategy Recommendations

Recommendations:	Use 200 ft. of protective boom in a "V" pattern.		
Number of personnel:	2-4	**Tidal influence:**	Medium
Water depth at mouth:	2 ft.	**Width of inlet:**	60 ft.

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Huntsman LLC Port Neches Performance Products (PNPP) is subject to multiple regulatory agency requirements with regards to releases, and so elects to consolidate non-technical response information under the NRT One Plan Guidance. Therefore, the PNPP Integrated Contingency Plan, of which this SPCC plan is included as Annex A, is cited in this SPCC where non-technical information has been provided in the Integrated Contingency Plan. Unless otherwise stated specifically, the technical information certified by a Professional Engineer is contained within Annex A 1
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SPCC PLAN PROFESSIONAL ENGINEER CERTIFICATION

[40 CFR 112.3.d.1]

This certification is required under 40 CFR 112 "Spill Prevention Control and Countermeasure Plan Regulation," and is applicable to Huntsman, LLC Port Neches Performance Products Facility

I hereby certify that I have reviewed the Spill Prevention Control and Countermeasure Plan Regulations," and is applicable to Huntsman, LLC Port Neches Performance Products Facility.

(i) I am familiar with the SPCC requirements of 40 CFR 112,
(ii) My authorized agent has visited and examined the PNPP facilities,
(iii) This Plan was prepared in accordance with good engineering practices considering applicable industry standards and the requirements of 40 CFR 112,
(iv) Procedures for inspections and testing as required by 40 CFR 112 have been established, and
(v) This Plan is adequate for the Huntsman PNPP facilities in Jefferson County, Texas.

This certification does in no way relieve Huntsman, LLC Port Neches Performance Products of their duty to prepare and fully implement this plan in accordance with 40 CFR Chapter 1, Part 112.

STATE OF TEXAS
MICHAEL F. STAFFILENO
66279
REGISTERED PROFESSIONAL ENGINEER

Michael Staffileno 9/30/08

Professional Engineer Signature/Seal

9/30/08
Date Reviewed/Sealed

Michael Staffileno, PE
Professional Engineer
Registration Number: 66279
State: Texas

This Professional Engineering Certification is contingent upon the implementation of required upgrades to the facility outlined in Annex A, Appendix A, Implementation Action Items.

Certification of the SPCC Plan by a Professional Engineer is contingent upon implementation of these facility upgrades to comply with the regulations and provide the facility adequate spill prevention and control measures pursuant to 40 CFR 112.7.c – General Secondary Containment Requirements.

Tank ID	Containment Modification
A46	Provide additional 416 gallon containment
A63	Provide additional 730 gallon containment
A64	Provide additional 326 gallon containment
A65	Provide additional 730 gallon containment
A66	Provide additional 230 gallon containment
A79	Provide 600 gallon containment
RBF Tank Farm	Complete Berm Inner Surface installation and re-survey to confirm adequate volume remains following inner surface placement
RBF Rail Load/Unload Racks	Install track pans per design for Tank Car Loading positions; Install valve on south load rack diversion/retention basin and increase containment capacity of north and south basins.

SPCC PLAN PROFESSIONAL ENGINEER CERTIFICATION

[40 CFR 112.3.D.1]

This certification is required under 40 CFR 112 "Spill Prevention Control and Countermeasure Plan Regulation," and is applicable to Huntsman, LLC Port Neches Performance Products Facility

I hereby certify that I have reviewed the Spill Prevention Control and Countermeasure Plan Regulations," and is applicable to Huntsman, LLC Port Neches Performance Products Facility.

(i) I am familiar with the SPCC requirements of 40 CFR 112,
(ii) My authorized agent has visited and examined the PNPP facilities,
(iii) This Plan was prepared in accordance with good engineering practices considering applicable industry standards and the requirements of 40 CFR 112,
(iv) Procedures for inspections and testing as required by 40 CFR 112 have been established, and
(v) This Plan is adequate for the Huntsman PNPP facilities in Jefferson County, Texas.

This certification does in no way relieve Huntsman, LLC Port Neches Performance Products of their duty to prepare and fully implement this plan in accordance with 40 CFR Chapter 1, Part 112.

_____

Date Reviewed/Sealed

Michael Staffileno, PE

Professional Engineer

Registration Number: 66279

State: Texas

_____

Professional Engineer Signature/Seal

This Professional Engineering Certification is contingent upon the implementation of required upgrades to the facility outlined in Annex A, Appendix A, Implementation Action Items.

Certification of the SPCC Plan by a Professional Engineer is contingent upon implementation of these facility upgrades to comply with the regulations and provide the facility adequate spill prevention and control measures pursuant to 40 CFR 112.7.c – General Secondary Containment Requirements.

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RBF Tank Farm	Complete Berm Inner Surface installation and re-survey to confirm adequate volume remains following inner surface placement
RBF Rail Load/Unload Racks	Install track pans per design for Tank Car Loading positions; Install valve on south load rack diversion/retention basin and increase containment capacity of north and south basins.

SPCC PLAN MANAGEMENT APPROVAL

[40 CFR 112.7.D]

Management approval has been extended at a level with authority to commit the necessary resources to implement this Spill Prevention Control and Countermeasure (SPCC) Plan. Pursuant to §112.7(d)(2) this is the written commitment of Huntsman LLC Port Neches Performance Products (PNPP) to provide the manpower, equipment and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful to human health and the environment. This Plan will be implemented as herein described and the Plan will be physically maintained at the Huntsman PNPP Facility.

I hereby certify that the information provided in this Spill Prevention Control and Countermeasure Plan is, to the best of my knowledge, true and accurate. This Plan has the full approval of the management for Huntsman Port Neches Performance Products (PNPP) and will be implemented as required by 40 CFR 112.

SITE MANAGER – Jordan Morgan Date

Huntsman Port Neches Performance Products

PLAN REVIEW AND TECHNICAL AMENDMENT CERTIFICATION

[40 CFR 112.5.b & c]

In accordance with §112.5(b), this SPCC Plan will be reviewed and evaluated, at a minimum, once every five years to determine if more effective prevention and control technology is available to significantly reduce the likelihood of a discharge. The review will be documented below and indicate if the Plan required amendment. Pursuant to §112.3(d), all technical amendments will be certified by a Professional Engineer and documented. Based on this review and evaluation, if needed the Plan will be amended within six months of the review and will be implemented as soon as possible, but not later than six months following Plan amendment.

* *Technical Amendment* - a change that requires the application of good engineering practice.

* *Non-technical Amendment* - change to contact list, more stringent requirements for stormwater discharges to comply with NPDES rules; phone numbers, product changes if new product is compatible with conditions of existing tank and secondary containment; and other changes which do not materially affect the facility's potential to discharge oil.

MANAGEMENT REVIEW: Pursuant to §112.5(b) and by means of this certification, I attest that I have completed a review and evaluation of this SPCC Plan for Huntsman Port Neches Performance Products in Jefferson County, Texas, and as a result:

☐ **Will** amend the Plan within six months of review and implement within six-months of Plan completion.

☐ Technical amendment *(PE certification required — see below)*

☐ Non-technical amendment

☐ **Will Not** amend the Plan.

_____ _____

Signature of Site Manager Date

PROFESSIONAL ENGINEER CERTIFICATION*: Pursuant to §112.3(d)(1) and by means of this certification I attest that: (1) I am familiar with the requirements of the SPCC rule (40 CFR 112); (ii) I or my authorized agent has visited and examined the facility; (iii) the Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of the SPCC rule; (iv) procedures for required inspections and testing have been established; and (v) the Plan is adequate for the Huntsman Port Neches Performance Products.*

_____ _____

Printed Name of Professional Engineer Date Sealed

_____

Signature of Professional Engineer/Seal

Registration No. _____ State _____

CHAPTER 2: APPLICABILITY AND PLAN REQUIREMENTS

[40 CFR 112.1 – 3]

SECTION 2.1 APPLICABILITY [40 CFR 112.1]

2.1.1 FEDERAL & STATE PROGRAMS - REGULATORY OVERVIEW

The Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, authorized the establishment of procedures, methods, equipment, and other requirements for the prevention and/or containment of discharges of oil and hazardous substances from vessels and onshore and offshore facilities. In partial response to this authorization, the U.S. Environmental Protection Agency (USEPA) issued Oil Pollution Prevention Regulations for Non-Transportation Related Onshore and Offshore Facilities on December 11, 1973 (effective on January 10, 1974). These regulations were published under Title 40 of the Code of Federal Regulations (CFR), Part 112 and specifically outlined requirements for the preparation of a Spill Prevention, Control, and Countermeasure Plan (SPCC Plan).

On July 17, 2002 the USEPA published modifications to the SPCC requirements in the Federal Register (Volume 67, No. 137, pages 47042-47152). These changes became effective August 16, 2002, and required active facilities to amend their existing Plans by August 17, 2004, to ensure compliance. On August 11, 2004, USEPA extended the deadline to February 17, 2006. On February 17, 2006 the USEPA extended the deadlines to October 31, 2007. This SPCC Plan has been prepared in accordance with the revised regulations.

The Oil Spill Prevention and Response Act of 1991 (OSPRA) designated the Texas General Land Office (TGLO) as the lead state agency in the State of Texas for the prevention and response to oil spills in the marine environment. On February 21, 1995 the TGLO adopted amendments to the OSPRA regulations in Title 31 of the Texas Administrative Code, Chapter 19 (31 TAC 19). The Act requires that all coastal facilities that pose a threat to coastal waters be certified by the TGLO. This certification consisted of completion and submission of the Discharge Prevention and Response Facility Certification Application and development and submission of an Oil Discharge Prevention and Response Plan. Huntsman Port Neches Performance Products received certification from the TGLO, which is valid for 5 years.

In 1996, the Texas Commission on Environmental Quality (TCEQ), formerly the Texas Natural Resource Conservation Commission (TNRCC), published *Spill Prevention and Control* Regulations contained in Title 30 of the Texas Administrative Code (TAC) Chapter 327 [30 TAC 327]. These regulations outline the notification requirements and actions required in the event of a spill.

THE FOLLOWING SECTIONS OF THIS PLAN ARE PRESENTED IN THE SEQUENCE OF THE NEW FEDERAL SPCC RULE. THE SUBSTANTIVE REQUIREMENTS OF THE PLAN (§112.7, AND §112.8) ARE ADDRESSED IN CHAPTERS 4 AND 5, RESPECTIVELY.

2.1.2 GENERAL APPLICABILITY AND SCOPE AND PURPOSE OF PLAN

The USEPA Oil Pollution Prevention regulations at 40 CFR Part 112 require preparation and implementation of a SPCC Plan by owners or operators of facilities meeting the following criteria:

- The facility is a non-transportation-related onshore or offshore facility.

- The facility is engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil or oil products.

- Due to the facility location, the facility could reasonably be expected to discharge oil in quantities that may be harmful (i.e., violate applicable water quality standards, cause a film or sheen upon or discoloration of the surface of the water, or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines) into or upon the Waters of the United States or adjoining shorelines.

- The facility has oil in:
  - Any aboveground container;
  - Any completely buried tank as defined in 40 CFR 112.2;
  - Any container that is used for standby storage, for seasonal storage, or for temporary storage that is not "permanently closed" as defined in 40 CFR 112.2;
  - Any "bunkered tank" or "partially buried tank" as defined in 40 CFR 112.2, or any container in a vault, each of which is considered an aboveground storage container for purposes of 40 CFR Part 112.

- The aggregate oil storage capacity of the facility is:
  - Equal to or greater than 1,320 gallons for aboveground containers 55 gallons or greater in size, or
  - Equal to or greater than 42,000 gallons for completely buried storage containers.

The primary objective of the SPCC Plan is to form a comprehensive spill prevention program for the facility that minimizes the potential for discharges of any oil or oily substances into or upon the waters of the United States. The SPCC Plan must address all relevant spill prevention, control and mitigation and containment measures necessary at the specific facility, including contingency planning, installation and use of containment equipment and devices, and implementation of operating procedures and best management practices to prevent and control the discharge of oil from facility operations.

Huntsman LLC Port Neches Performance Products (PNPP) is required to prepare and implement SPCC Plans for the following PNPP facilities:

- Port Neches Performance Products (consisting of Oxides and Olefins (O&O) Facility, Propylene Oxide/ Methyl-Tert-Butyl Ether (PO/MTBE) Facility, and Renewable Biofuels (RBF) Facility), Port Neches, TX
- PNPP Joint Wastewater Treatment Plant (JWWTP), Port Neches, TX

2.1.3 APPLICABILITY OF SPECIFIC SPCC REQUIREMENTS

The USEPA Oil Pollution Prevention regulations at 40 CFR Part 112 provide general spill prevention, control, and countermeasure requirements for all facilities and all types of oil (including, but not limited to, petroleum oils, non-petroleum oils, and vegetable oils), and additional requirements based on the type of oil that could be discharged and the nature of the facility (e.g., onshore or offshore; production, non-production, drilling, or workover). All applicable SPCC requirements must be addressed in the facility's SPCC Plan.

The Huntsman PNPP facilities covered under this Plan are all non-production, onshore facilities storing, processing, transferring, distributing, using, or consuming petroleum oil or oil products. These facilities are subject to the following SPCC regulations, which are applicable to all facilities subject to 40 CFR Part 112:

- 40 CFR 112.3, *Requirement to Prepare and Implement a Spill Prevention, Control, and Countermeasure Plan*;
- 40 CFR 112.4, *Amendment of Spill Prevention, Control and Countermeasure Plan by Regional Administrator*;
- 40 CFR 112.5, *Amendment of Spill Prevention, Control and Countermeasure Plan by Owners or Operators*; and

- 40 CFR 112.7, *General Requirements for Spill Prevention, Control, and Countermeasure Plans.*

These facilities are also subject to the following SPCC regulations, which are applicable to all non-production onshore facilities:

- 40 CFR 112.8, *Spill Prevention, Control, and Countermeasure Plan Requirements for Onshore Facilities (Excluding Production Facilities).*

No other SPCC requirements of 40 CFR Part 112 applies to the Huntsman PNPP facilities. However, these facilities are subject to the response requirements of 40 CFR Part 112, Subpart D, which is discussed further in **Chapter 6** of this Plan.

This Plan complies with all applicable 40 CFR Part 112 requirements for preparation, implementation, and amendment of SPCC Plans.

SECTION 2.2 DEFINITIONS [40 CFR 112.2]

Some of the key definitions used in this Plan are provided below.

Bulk storage container means any container used to store oil. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce. Oil-filled electrical, operating, or manufacturing equipment is not a bulk storage container.

Complex means a facility possessing a combination of transportation-related and non-transportation-related components that is subject to the jurisdiction of more than one Federal agency under Section 311(j) of the Clean Water Act (CWA).

Discharge includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under CWA Section 402; discharges resulting from circumstances identified, reviewed, and made a part of the public record with respect to a permit issued or modified under CWA Section 402, and subject to a condition in such permit; or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under CWA Section 402, that are caused by events occurring within the scope of relevant operating or treatment systems. For purposes of the SPCC regulations, the term

discharge shall not include any discharge of oil that is authorized by a permit issued under Section 13 of the River and Harbor Act of 1899 (33 U.S.C. 407).

Facility means any mobile or fixed, onshore or offshore building, structure, installation, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil processing, oil transfer, oil distribution, and waste treatment, or in which oil is used, as described in Appendix A of 40 CFR Part 112. The boundaries of a facility depend on several site-specific factors, including, but not limited to, the ownership or operation of buildings, structures, and equipment on the same site and the types of activity at the site.

Navigable Waters or Waters of the United States means:

(i) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide;

(ii) All interstate waters, including interstate wetlands;

(iii) All other waters, such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:

(a) That are or could be used by interstate or foreign travelers for recreation or other purposes; or,

(b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or,

(c) That are or could be used for industrial purposes by industries in interstate commerce;

(iv) All impoundments of water otherwise defined as waters of the United States under the Clean Water Act or implementing regulation;

(v) Tributaries of waters identified above;

(vi) The territorial sea; and

(vii) Wetlands adjacent to the waters identified above (other than waters that are themselves wetlands).

Oil means oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Oil Spill Removal Organization (OSRO) means an entity that provides oil spill response resources, and includes any for-profit or not-for-profit contractor, cooperative, or in-house response resources that have been established in a geographic area to provide required response resources.

Owner or Operator means any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned offshore facility, the person who owned or operated or maintained the facility immediately prior to such abandonment.

Permanently Closed means any container for facility for which:

(1) All liquid and sludge has been removed from each container and connecting line; and

(2) All connecting lines and piping have been disconnected from the container an blanked off; all valves (except for ventilation valves) have been closed and locked; and conspicuous signs have been posted on each container stating that it is a permanently closed container, noting the date of closure.

Petroleum Oil means petroleum in any form, including but not limited to crude oil, fuel oil, mineral oil, sludge, oil refuse, and refined products.

Storage Capacity of a container means the shell capacity of the container.

SECTION 2.3 SPCC PLAN PREPARATION AND IMPLEMENTATION REQUIREMENTS [40 CFR 112.3]

In accordance with 40 CFR 112.3(d)(1), a Registered Professional Engineer must review and certify the Plan (**Chapter 1**). The certifying engineer attests that:

- He is familiar with the SPCC requirements of 40 CFR 112;
- He or his agent has visited and examined the facility;

- This Plan was prepared in accordance with good engineering practices considering applicable industry standards and the requirements of 40 CFR 112;

- Procedures for inspections and testing as required by 40 CFR 112 have been established; and

- This Plan is adequate for the Huntsman PNPP facilities addressed.

In accordance with 40 CFR 112.7, this Plan has been prepared in accordance with good engineering practices and has the full approval of management at a level with authority to commit the necessary resources. Management approval is provided in **Chapter 1.**

The Huntsman PNPP facilities are attended 24 hours per day, 7 days per week. A complete copy of the Plan is kept on file in the Huntsman PNPP Administration Building and an electronic copy is maintained on the Huntsman PNPP Intranet. The Environmental Department also maintains a copy of the Plan. The Plan is available for review by the USEPA Regional Administrator and the Texas General Land Office (TGLO) during normal working hours.

CHAPTER 3: REVIEW OF AND AMENDMENTS TO PLAN

[40 CFR 112.4 & 5]

SECTION 3.1 AMENDMENT OF SPCC PLAN BY REGIONAL ADMINISTRATOR [40 CFR 112.4]

In accordance with §112.4(a), Huntsman LLC Port Neches Performance Products (PNPP) must submit a report to the USEPA Region VI and the TGLO whenever requested by the agencies or within 60 days of a discharge of oil into navigable waters, which exceeds:

- 1,000 US gallons in a single spill event; or
- 42 US gallons in two spill events within any consecutive 12-month period.

The following information must be provided in the report to the USEPA Regional Administrator and the TGLO:

Requirement	Response
1. Name of the facility:	1. *Huntsman Port Neches Performance Products*
2. Name of the owner/operator of the facility:	2. *Huntsman LLC*
3. Location of the facility:	3. *Site Dependent Road, City, Jefferson County, Texas*
4. Maximum storage or handling capacity of the facility and normal daily throughput at the facility:	4. *Maximum storage capacity in gallons*
5. Corrective actions and countermeasures taken, including a description of equipment repairs and replacements:	5. *Incident Specific Information*

6. Description of the facility, including maps, flow diagrams, and topographical maps, as necessary:	*6. Incident Specific Information*
7. The cause(s) of the discharge(s), including failure analysis of the system or sub-system in which the failure occurred:	*7. Incident Specific Information*
8. Additional preventative measures taken or contemplated to minimize the possibility of recurrence:	*8. Incident Specific Information*
9. Other information that may be reasonably required pertinent to the SPCC or discharge:	*9. Incident Specific Information*

After reviewing information submitted regarding the discharge described above, the USEPA Regional Administrator may require the Plan to be amended:

(a.) If the TGLO recommends the Plan be amended, or

(b.) If, following an USEPA on-site review of the Plan, the agency finds that the Plan does not meet the requirements of 40 CFR 112 or that an amendment is needed to prevent and contain discharges from the Huntsman PNPP facility.

Huntsman may respond to an amendment request notice issued by the USEPA Regional Administrator. If Huntsman responds, additional support information, and the facility's views and/or arguments for or against the proposed amendment must be submitted to the USEPA within 30 days of receipt of the amendment request notice. The USEPA must consider all relevant material presented and notify Huntsman that the proposed amendment is required or that the agency intends to rescind the notice.

Huntsman may appeal the amendment request in writing within 30 days of receipt of a notice from the USEPA Regional Administrator. If Huntsman appeals the amendment notice, the facility should clearly and concisely state the issues and points of fact in the case. The appeal must be submitted to the USEPA Administrator in Washington, DC and a copy provided to the Regional Administrator. The USEPA Administrator may request additional information from Huntsman or any other person, but must render a final decision and notify the facility within 60 days of receipt of the appeal.

If required to amend the Plan, Huntsman must amend the Plan within 30 days of receipt of the notice, unless the USEPA specifies an alternative time period. Huntsman must then implement the Plan

amendments as soon as possible, but no later than six months after Plan amendment. As required by 112.3(d)(1), a Professional Engineer must certify technical amendments to the Plan. Typical documentation for Plan Amendment Review and Certification for technical amendments is included in **Chapter 1.**

SECTION 3.2 REVIEW AND AMENDMENT OF SPCC PLAN BY OWNER/OPERATOR [40 CFR 112.5]

In accordance with §112.5(b), Huntsman is required to review this Plan at least once every five years from the date of the last review. A signed statement indicating if the Plan was amended must document each review. Documentation for Plan Review and Evaluation is included in **Chapter 1** of this Plan.

Huntsman must amend the SPCC Plan as needed, if one of the following events occurs.

(1) There is a change in the facility design, construction, operation or maintenance that materially affects the potential for a discharge to a waterbody. Examples of changes that may require amendment of the plan include, but are not limited to:

(a) Commissioning or decommissioning of fixed storage containers (not portable containers),

(b) Replacement, reconstruction, or movement of fixed storage containers,

(c) Replacement or reconstruction of portable storage tanks,

(d) Construction or demolition of secondary containment structures, or

(e) Revisions to standard operating or maintenance procedures.

(2) Review of the SPCC Plan indicates that more effective field-proven prevention and control technology is available and will significantly reduce the likelihood of a discharge.

The Plan must be amended within six months of the facility change or review of the Plan and implemented as soon as possible, but no later than six months following amendment. The designated person accountable for oil spill prevention at the facility will document completion of each five-year review, sign a statement as to whether the Plan will be amended, and record the results. In accordance with 40 CFR 112.3(d), a Professional Engineer must certify technical amendments. Typical documentation for Plan Amendment Review and Certification is included in **Chapter 1.** If Huntsman is unsure whether the change is technical or non-technical, the amendment should be certified.

CHAPTER 4: GENERAL SPCC PLAN REQUIREMENTS

[40 CFR 112.7]

SECTION 4.1 SPCC PLAN CONFORMANCE AND DEVIATIONS [40 CFR 112.7.A.1 AND 2]

HUNTSMAN LLC PORT NECHES PERFORMANCE PRODUCTS (PNPP) IS SUBJECT TO MULTIPLE REGULATORY AGENCY REQUIREMENTS WITH REGARDS TO RELEASES, AND SO ELECTS TO CONSOLIDATE NON-TECHNICAL RESPONSE INFORMATION UNDER THE NRT ONE PLAN GUIDANCE. THEREFORE, THE PNPP INTEGRATED CONTINGENCY PLAN, OF WHICH THIS SPCC PLAN IS INCLUDED AS ANNEX A, IS CITED IN THIS SPCC WHERE NON-TECHNICAL INFORMATION HAS BEEN PROVIDED IN THE INTEGRATED CONTINGENCY PLAN. UNLESS OTHERWISE STATED SPECIFICALLY, THE TECHNICAL INFORMATION CERTIFIED BY A PROFESSIONAL ENGINEER IS CONTAINED WITHIN ANNEX A.

THIS SPCC PLAN CONFORMS WITH AND DOES NOT DEVIATE FROM THE REQUIREMENTS OF 40 CFR §112.7, WITH THE EXCEPTION OF IDENTIFIED UPGRADE REQUIREMENTS AS NOTED IN ANNEX A, APPENDIX A, **IMPLEMENTATION ACTION ITEMS.**

SECTION 4.2 FACILITY DESCRIPTION [40 CFR 112.7.A.3]

Two Huntsman PNPP facilities are addressed by this Plan (1) Oxides and Olefins (O&O), Propylene Oxide/Methyl-Tertiary Butyl Ether (PO/MTBE), and Renewable Biofuels (RBF) Facility; and (2) the PNPP Joint Wastewater Treatment Plant (JWWTP). Facility description is provided in **Section 1.2.** and **Section 2.0.** Information Summary of the Huntsman Port Neches Performance Products PNPP) Integrated Contingency Plan (ICP**).** A vicinity map is included in **Appendix A** of the ICP. Plot plans of each facility are also included in **Appendix A** of the ICP.

SECTION 4.3 CONTAINER LOCATION, CONTENTS AND FABRICATION [40 CFR 112.7.A.3.I]

The oil storage areas for each facility are shown on the Oil Tank/Container Plot in **Appendix A** of the ICP. There is one completely buried underground storage tank at the facility. The aboveground storage containers applicable to this Plan (55 gallons or those greater) are listed in **Table 1** of Annex A of this plan. The table lists the asset number, container contents, storage capacity, materials of construction, date of construction, and containment adequacy for petroleum products, used and waste oil, oily wastewater, and animal fats or vegetable oils.

Although oil-filled equipment is not considered a container as defined by §112.2, the preamble of the rule (FR 47054-47055) indicates that applicability criteria such as oil storage capacity, the potential for discharge and the prevention of discharges from such equipment do apply and are within the scope of the SPCC rule. Therefore, **Table 2** lists the oil-filled electrical transformers with oil storage capacity of 55 gallons or greater.

Section 4.4 Discharge Prevention Measures, Controls, and Countermeasures [40 CFR 112.7.a.3.ii, iii, iv]

Discharge prevention measures including procedures for discharge or drainage controls such as secondary containment; procedures for control of discharge; routine handling of products (loading, unloading, and facility transfers); and countermeasures for discharge discovery, response, and cleanup are discussed below.

All fixed bulk storage containers and portable or temporary containers of oil at the Huntsman PNPP facilities are located within secondary containment structures and/or located in areas that drain to a wastewater treatment facility where oil can be recovered, to the extent possible. All operators are trained to detect leaks and conduct emergency transfers of product, if necessary. The operators are required to inspect all tanks and piping in use before and during product movement. The fixed tanks are equipped with automatic tank gauging devices and high liquid level alarms.

Appropriate containment and/or diversionary structures are provided at the PNPP facilities to prevent a discharge from reaching navigable waters. All PNPP facilities have a dual-drainage ditch system: Clean Water Ditches and Dirty/Oily Water (DOW) Ditches. The products stored at the Huntsman PNPP facilities (fuels, dielectric fluids, lubricating oils, and petroleum and non-petroleum oil based feedstocks/products) are non-corrosive materials and are compatible with the materials of construction of the storage containers and containment structures.

Operators visually inspect the exterior of the oil storage containers and equipment for overt signs of deterioration or leaks, and also inspect the tank area for evidence of leaks, cracks or other signs of deterioration. Qualified operations personnel for each unit perform, during each shift, inspections of all oil storage containers, equipment, and associated pumps and valves in accordance with the written procedures outlined in Huntsman PNPP **INSP-GEN-VT7**.

In the event of a small release, the facility has trained personnel and equipment available to contain and clean up the spill. On-site equipment and materials for clean up of minor spills includes, but is not limited to the materials listed below. The following minimum equipment is stored at the warehouse and is available to assist with spill control and cleanup at the O&O, PO/MTBE, RBF, and JWWTP facilities.

SPILL CONTROL/CLEAN-UP EQUIPMENT	
Minimum Quantity	**Description**
2	Pallets of absorbent material
8	Bags of 4"X10' absorbent socks

4	Shovels
2	Boxes (200 count) general purpose bale pads
2	Boxes (200 count) oil bale pads

In the case of a larger release, specific response procedures are addressed in greater detail in the facility's Integrated Contingency Plan (ICP), of which this SPCC Plan is included as Annex A. As part of that ICP, external resources (contractors and local emergency agencies) are available to assist Huntsman PNPP with emergency response, industrial power vacuuming, decontamination, excavation/earthmoving and waste transportation and disposal services, as necessary.

Alternate discharge prevention, diversion and containment measures for portable or temporary containers and oil-filled electrical equipment are addressed in **Section 4.9** below. Prior to the discharge of stormwater from a secondary containment area, the accumulated stormwater is visually inspected for oil sheen and any oil is removed to the extent practical.

Clean Water Ditches

The clean water ditches capture stormwater runoff from areas of the facilities that have a negligible probability of having oil contamination, such as:

- Parking lots,
- Undeveloped land, and
- Tank farms (non-petroleum)

Water collected in these ditches is discharged off-site without treatment, through permitted outfalls, into the County Drainage District No. 7 (DD7) ditch or the Neches River. These ditches and outfalls are observed frequently enough to detect contamination arising from an incident in the non-process areas and return the flow to the facility for treatment, if necessary.

DOW Ditches

The dirty, oily water (DOW) ditches catch surface runoff from any area of the plants where oil spills may occur, including

- Areas surrounding the battery limits of the process units, and
- Most diked storage areas.

All concrete process areas drain into a process sewer or DOW ditch. Surface runoff collected in the DOW ditches is commingled with streams from the process sewer and then pumped to treatment facilities (JWWTP).

All PNPP facilities have storm surge ponds, which are used to collect streams from the DOW ditches during periods of heavy rainfall to avoid overloading the treatment facilities. Any valve located within the DOW Ditch System is normally closed and manually operated. After a heavy rainfall, accumulated stormwater is gradually directed to treatment.

Since contaminated water from the ditch system must be pumped to the treatment systems, any spilled oil can be contained within the collection ditch by shutting down the pumps. In addition, the water treatment facilities are inspected and observed frequently to detect any spill events that may have occurred due to process upsets and to prevent spills from leaving PNPP property and entering waters of the state.

O&O Facility

Every effort has been made to guard against the discharge of oil into the facility ditches or sewer systems; however some smaller tanks are not entirely protected by secondary containment systems.

All waters, both in the clean water ditches and in the sewer system are collected in the Second Street ditch, a large, concrete-lined drainage header. The ditch is visually inspected by operations personnel daily. If small amounts of oil are observed, the oil and/or oily water is removed by vacuum truck.

During routine daily inspections, if an operator observes oil in the suction bay of the pumps discharging to the JWWTP, it will be vacuumed and returned to tankage. If the oil reaches the JWWTP, steps are taken to remove the oil. The JWWTP operators are instructed to notify the Boiler House at the O&O Facility if there are concerns with the facility's wastewater quality.

In case of a large spill, tank rupture, or dike failure that results in a large amount of oil or other oil product, which can not be confined and removed from the ditches or sewer system, the Boiler House is notified immediately. The total wastewater flow from the O&O Facility can then be diverted to the north impoundment pond designated for emergency wastewater storage (approximately 6.5 million gallons). The wastewater can then be redirected to the JWWTP. Oil from the pond can also be removed by vacuum trucks and transferred to tankage, if needed. The "oil-free" water will then flow from the pond through underflow pipes to treatment. Spills of water-soluble pollutants escaping containment and contaminating stormwater or ditch water will be handled in a similar manner.

If the north impoundment pond is full or not available for use, PV-21 pumps will be shutdown and contaminated water will then flow to the stormwater reservoir. Highly contaminated or oily water will not be discharged from the reservoir until the Huntsman Environmental Department approves the selected disposition of the wastewater.

PO/MTBE Facility

All process tanks at the PO/MTBE Facility are within secondary containment; however, tanks at the Boiler Facility are outside of secondary containment. Spills from these tanks will be contained in ditches, which drain to the DOW contaminated water pond, which continuously flows to the JWWTP.

Process liquid fuel tanks are located within a concrete diked area sealed with a painted-on impervious liner to contain spills. Wastewaters contained within the DOW stormwater pond is sampled and analyzed prior to discharge through the stormwater outfall.

RBF Facility

All flow through process tanks and oil storage tanks at the RBF Facility are within secondary containment. Oil storage tanks within the process area are contained by concrete curbing and drainage is directed to a concrete lined central collection ditch equipped with two containment gate valves. The ditch is visually inspected by operations personnel daily. If small amounts of oil are observed, the oil and/or oily water is removed by vacuum truck and returned to tankage or alternate temporary storage facilities for disposal or recycling as appropriate. If significant volume of water or oil is present, it is pumped to the stormwater impoundment adjacent to the RBF facility and is then directed to the JWWTP.

Larger oil storage tanks are located within an earthen secondary containment berm with adequate capacity to contain the entire contents of the largest storage tank, plus freeboard for rain. Visual inspections are conducted prior to opening the normally closed and manually operated drain valves. During routine daily inspections, if an operator observes oil in the storage tank secondary containment area, it will be vacuumed and returned to tankage or alternate temporary storage facilities for disposal or recycling as appropriate.

Railroad tank car loading/unloading at RBF occurs to the north and south of the main process area. Each loading rack is equipped with loading arm high level switches that stop the loading pump from operating when the tank car is fully loaded. Each loading position is also designed with track pans routed to an onsite release retention or diversionary structure that directs oil to a spill collection impoundment. The north load area is designed with a collection/diversion system that directs spilled liquid to an earthen impoundment basin constructed to the north of the load area. The south load area is designed with a collection/diversion system that directs spilled liquid to an earthen impoundment basin constructed to the south of the load area. Each system is designed with adequate capacity to contain the contents of the largest rail car compartment and is designed with a manual valve that is maintained in the closed position during loading operations. The impoundment systems will contain a release until oil recovery operations are initiated.

Should storage tank secondary containment drain valve or tank car loading collection system failure occur or if rain in excess of the planning scenario occurred before the storage tank containment area or tank car loading collection system is drained, the spilled material will travel through the earthen-

bermed containment area, onsite earthen ditches, and then to the Outfall #801 ditch which is authorized under the JWWTP TPDES Industrial Wastewater Discharge Permit. Access roads and spill containment boom placement sites are available in multiple locations along this drainage. Additionally, earth moving equipment and contracts are in place to construct underflow/overflow dams as necessary to contain spilled oil.

In summary, any release of oil within the process areas of the O&O, PO/MTBE and RBF facilities will be routed to the ditch system then to the JWWTP. In the unlikely event of a large spill concurrent with a secondary containment failure, oil and oil products will be captured within the wastewater treatment systems or contained using spill response measures. Vacuum trucks or sorbents will be used to remove the contained oil and oily materials prior to discharge.

All loading, unloading, and facility transfers of oils are conducted according to established operating procedures. The facilities are manned 24 hours per day, seven days per week. Any oil discharge would be discovered during general rounds and routine inspections during loading and unloading operations.

Section 4.5 Methods of Disposal [40 CFR 112.7.a.3.v]

Method of disposal is provided in **Section 4.5** of the Huntsman PNPP Integrated Contingency Plan.

SECTION 4.6 CONTACT LIST [40 CFR 112.7.A.3.VI]

Contact list is provided in Appendix B of the Huntsman PNPP ICP. Additional information regarding notification procedures is provided in **Section 3.4**. of the ICP.

SECTION 4.7 DISCHARGE REPORTING [40 CFR 112.7.A.4]

Discharge Reporting and Notification Procedures are provided in **Section 3.4** of the Huntsman PNPP ICP.

SECTION 4.8 DISCHARGE PROCEDURES [40 CFR 112.7.A.5]

Discharge Procedures are provided in **Sections 3.4** of the Huntsman PNPP ICP.

SECTION 4.9 EQUIPMENT FAILURE [40 CFR 112.7.B]

Natural disasters, such as earthquakes, are considered of a limited concern in the analysis of spill potential, since the Huntsman Port Neches Performance Products facility is not located in an area prone to earthquakes. However, a direct hit by a hurricane is possible, but not considered as significant compared with other potential causes of releases, such as tank and railcar loading/unloading operations and tank failures; therefore, the analysis focused on the latter.

The probabilities of single-wall storage tank failures and releases during loading operations are 1 x 10^{-4} per tank per year and 1 x 10^{-2} per hose per year, respectively based on *U.S. DOT, FEMA, and U.S. EPA Handbook of Chemical Hazard Analysis Procedures*. Although there is a greater potential for a release during loading operations, the greatest volume of material potentially released would most likely occur during a tank failure concurrent with secondary containment failure occurring during a heavy rain event. Most storage tanks and loading areas are provided with secondary containment as noted in **Annex A**, **Table 1** to ensure released materials are confined to Huntsman PNPP property. In addition, the final outfalls from the facilities to waters of the state are protected from discharging released/spilled materials; therefore, the potential for a spill leaving Huntsman PNPP property is low.

Potential discharge sources at the Huntsman PNPP Facility include storage tank areas, process area, tank truck unloading and rail car loading/unloading. The greatest potential for the release and/or spill of oil is the loading of slop oil into railcars at the railcar loading rack. The second most likely spill source is the loading of tanks from tank trucks, and the third most likely source posing a risk is a single-wall storage tank failure.

SECTION 4.10 CONTAINMENT AND DIVERSIONARY STRUCTURES OR EQUIPMENT [40 CFR 112.7.C]

In accordance with §112.7(c)(1), adequate containment and/or diversionary structures must be provided to prevent a discharge. The containment system must be constructed such that any discharge from the primary containment (tank or pipe) will not escape prior to cleanup. Acceptable preventative systems include but are not limited to, dikes, berms, retaining walls, spill diversion ponds or retention ponds. Except for storage tank A46, A63, A64, A65, A66, and A79 and RBF rail load/unload racks, all other tanks, equipment and/or containers used to store oil have adequate containment and/or diversionary structures associated with each unit. In order to meet secondary containment requirements, refer to **Appendix A** Implementation Action Item 1, in order to identify the specific secondary containment deficiency associated with each tank.

Except as described below, containers of oil at the Huntsman PNPP Facilities are located within a secondary containment structure and/or located in an area that drains to the PNPP Joint Wastewater Treatment System or a surface impoundment (retention pond). The asset number, contents, location, storage capacity, materials of construction, date of construction, and containment adequacy for containers of oil, petroleum products, used or waste oils, or oily wastewater with an oil storage capacity of 55-gallons or greater are listed in **Table 2** of the ICP.

Occasionally, portable containers (totes or drums) of oil may be temporarily located outside of containment areas or outside of wastewater treatment system drainage areas. These containers will either be placed in portable containment structures, have oil booms placed around them, or have oil boom placed in the nearest stormwater ditch to prevent any accidental discharge from reaching navigable waters of the state.

Also, there is electrical oil-filled equipment (i.e. transformers) that is not provided with secondary containment and is located outside of the drainage areas, which are routed to the wastewater treatment system. Oil booms will be located in stormwater ditches near this equipment.

SECTION 4.11 SPILL CONTAINMENT PRACTICABILITY [40 CFR 112.7.D]

If it is impracticable to install any structures or equipment to prevent a discharge, such as conducting periodic integrity testing of containers or periodic integrity and leak testing of valves and piping and the facility does not have a Facility Response Plan (FRP), then an oil spill contingency plan or written commitment of manpower, equipment and materials to expeditiously control and removal any harmful quantities of oil discharged must be prepared. The Huntsman PNPP facilities have prepared an ICP.

SECTION 4.12 INSPECTIONS, TESTS, AND RECORDS [40 CFR 112.7.E]

Inspections, Tests, and Records are provided in **Section 6.0** of the Huntsman PNPP ICP.

SECTION 4.13 PERSONNEL, TRAINING, AND DISCHARGE PREVENTION PROCEDURES [40 CFR 112.7.F]

Facility personnel receive training on operation and maintenance of equipment to prevent discharges and general facility operations through Huntsman job position/function training and qualification processes. The Huntsman Training Department maintains training records and documentation of personnel qualifications.

Annual training is conducted to ensure adequate understanding of the SPCC Plan and requirements. The training program highlights and addresses discharges of oil occurring at the Huntsman PNPP facilities, failures or malfunctions of diversionary or containment equipment or structures, and any recently developed precautionary measures. Annual training will also address any new spill regulations, modifications to existing operating systems, changes in personnel responsibilities, or amendments to this Plan. Training will be updated as necessary to reflect current facility spill prevention and control measures, clean up procedures, waste management practices, and regulatory requirements.

The Primary Qualified Individual (QI) as designated in the Huntsman PNPP ICP is designated as the person accountable for discharge prevention at the Huntsman PNPP facilities.

The Huntsman PNPP spill prevention, control and response-training program is based on the duties and functions that the responder will perform. A comprehensive training program for Huntsman PNPP response addresses the following pertinent topics:

- Operation and maintenance of equipment to prevent discharges of oil or oily materials,

- Safety Training, and
- Spill prevention and response operation briefings.

OPERATION AND MAINTENANCE OF EQUIPMENT

Facility personnel are regularly trained in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and the contents of this Plan. If new equipment is installed, a qualified representative will train the operations employees. Operations and maintenance manuals are located at the facility for reference as needed.

Preventative maintenance is scheduled and performed for spill prevention and control equipment in accordance with manufacturer's recommendations and facility personnel operations and maintenance experience. The periodic maintenance of this equipment along with spill exercises provides personnel with a continuing opportunity for "on-the-job" training.

SAFETY TRAINING

This Plan serves as a training guide for procedures that will be followed in the event of a spill or release of oil. Personnel are also trained in Hazardous Waste Operations and Emergency Response (HAZWOPER) in accordance with the requirements in 29 CFR 1910.120, to the level necessary to safely carry out their job responsibilities.

SPILL PREVENTION BRIEFINGS

The QI or his/her designated representative conducts briefings on an annual basis. The intent of these sessions is to improve product handling to prevent future pollution incidents, and to review spill control and response techniques. These briefings highlight and describe known spill events or failures, malfunctioning components, and recently developed precautionary measures to prevent spills. These briefings are documented on training records maintained at Huntsman PNPP administration building and retained for five years.

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

SECTION 4.15 FACILITY TANK CAR AND TANK TRUCK LOADING/UNLOADING RACK [40 CFR 112.7.H]

All loading and unloading of oil is conducted in accordance with established procedures. All process vessels storing, using, or recirculating oil at O&O, PO/MTBE and RBF facilities are located in concrete process areas that drain through the process sewer to the JWWTP for treatment before being discharged off-site. Storage tanks within process areas are, in general, loaded from vendor tank trucks parked near the base of the tank. Process area storage tank loading containment is generally provided by the facility ditch system, which has adequate capacity to hold the entire contents of the largest compartment of any tanker servicing the Huntsman PNPP facilities. Any spills during loading would be captured in the ditch system, isolated and recovered prior to discharge to waters of the state.

Prior to loading and unloading operations, tank truck wheels are chocked at the front and rear to prevent forward or backward movement of the vehicle prior to the disconnection of transfer lines. Loading/unloading operations are attended by the truck driver and a facility employee at all times. Prior to filling or departure of the tank truck or tank car, all drains and outlets are closely inspected for signs of leaks or drips.

Loading/Unloading Areas

Tank truck unloading and tank car loading/unloading procedures meet the minimum requirements of the Department of Transportation regulations for loading/unloading and shipping of oils and other hazardous materials.

It is standard procedure at Huntsman PNPP facilities to:

- Install de-railers and/or warning flags ahead of tank car rack spurs where loading/unloading operations are scheduled or in progress.

- Provide tank car and tank truck chocks to prevent vehicular movement.

Tank truck drivers are required to notify facility personnel when loading/unloading is complete so that a final check of equipment can be conducted. Any observed incomplete disconnects and/or valve leakage will be corrected at this time.

Before the departure of any tank car or tank truck, Huntsman PNPP personnel examine:

- All tank outlets closely for leakage,
- Bottom internal valves for leakage before the external cap is installed, and
- For tank cars or trucks equipped with heating coils, the steam hose and discharge lines are disconnected, if used, and coils are checked for leakage before release of the vehicle.

Tank Car Loading Rack

The O&O and RBF Facilities operate tank car loading and unloading racks for oil cargoes. Containment is provided either at the loading area or by the facility process wastewater treatment system. In addition, some oil products are stored temporarily in tank cars at both facilities prior to shipment.

Containment for the contents of the largest compartment of any tank car loaded/unloaded at this area is provided by the process area wastewater drainage system and/or by use of track pan and collection/diversion system.

SECTION 4.16 FIELD CONSTRUCTED CONTAINERS [40 CFR 112.7.I]

If a field constructed aboveground container is repaired, altered, or reconstructed, or there is a change in tank service that may affect the potentially for discharge, the container will be evaluated prior to being returned to service. Huntsman PNPP **INSP-GEN-LT3** procedure requires hydrostatic testing of all tanks requiring weld repairs prior to return to service.

SECTION 4.17 APPLICABLE STATE RULES, REGULATIONS, AND GUIDELINES [40 CFR 112.7.J AND 31 TAC 19]

The TGLO regulates prevention of and response to unauthorized oil discharges potentially affecting the coastal waters of the state of Texas under 31 TAC Chapter 19. An unauthorized discharge is defined as any discharge of a harmful quantity of oil from a vessel or facility either into coastal waters; or on any waters or land adjacent to coastal waters where harmful quantities of oil may enter coastal waters or threaten to enter coastal waters, if the discharge is not abated, contained and the oil removed.

Unauthorized discharges exclude those authorized by and in compliance with a government permit, seepage from the earth solely from natural causes, and unavoidable, minute discharges of oil from a properly functioning engine. In addition, 31 TAC 19.13 defines the oil discharge prevention and response planning requirements applicable to "waterfront" facilities, which may discharge oil into coastal waters or adjoining shorelines. All applicable oil discharge prevention and response requirements of the TGLO regulations are addressed in the Huntsman PNPP ICP. TGLO discharge notification requirements are also addressed in the Huntsman PNPP ICP.

CHAPTER 5: SPCC REQUIREMENTS FOR ONSHORE FACILITIES

[40 CFR 112.8]

SECTION 5.1 GENERAL PLAN REQUIREMENTS AND DISCHARGE PREVENTION AND CONTAINMENT PROCEDURES [40 CFR 112.8.A]

AS PREVIOUSLY INDICATED IN SECTION 4.1, THIS PLAN CONFORMS WITH AND DOES NOT DEVIATE FROM THE REQUIREMENTS OF §112.7, WITH THE EXCEPTION OF IDENTIFIED UPGRADE REQUIREMENTS (REFER TO APPENDIX A, IMPLEMENTATION ACTION ITEMS). SECTION 5 OF THIS PLAN PRESENTS FACILITY-SPECIFIC DETAILS ASSOCIATED WITH THE REQUIREMENTS FOR ONSHORE NON-PRODUCTION FACILITIES AS OUTLINED IN §112.8.

SECTION 5.2 FACILITY DRAINAGE [40 CFR 112.8.B]

The Huntsman PNPP facilities are located on approximately 2,400 acres. It is within the Neches River watershed east of Port Neches on Farm to Market Road 366 between State Highway Spur 136 and Hogaboom Road. Discharge is via plant conduits and drainage ditches to the Star Lake Canal; thence to the Neches River Tidal and/or directly to the Neches River Tidal (Segment No. 0601) of the Neches River Basin.

All Huntsman PNPP facilities have drainage systems engineered to prevent oil spills within the units from reaching navigable waters. Drainage from diked storage areas without drain valves is captured and contained within the facility ditch systems. Plant personnel supervise drainage from diked storage areas with valved drains during discharge.

Accumulated stormwater is inspected visually for oil contamination prior to opening the drain valves. Contaminated stormwater in containment areas not equipped with drainpipes is pumped out using vacuum trucks and transferred to tankage.

A record of containment drainage activities is recorded on the Daily Shift Report Form for each unit or operation area. Examples of typical operating area reporting forms are included in **Appendix F** of the ICP. The completed forms are maintained on file in the respective process areas for a period of three years. Recordkeeping requirements for stormwater bypasses will be in accordance with the Huntsman TPDES permit. Records will be maintained in the Huntsman PNPP environmental files.

O&O, PO/MTBE and RBF Facilities

The process areas of these Huntsman PNPP facilities are designed to direct drainage to the JWWTP. Drainage from storage areas is restrained by manually operated valves to prevent an uncontrolled discharge to the drainage and effluent treatment system, or direct discharge to waters of the state. Stormwater collected in containment areas is visually inspected prior to discharge to ensure no oil is discharged. Drainage from areas without secondary containment located in process areas is directed to the JWWTP where it is contained for recovery. Huntsman PNPP facilities drainage patterns are shown on the Drainage Map located in **Appendix A** of the ICP.

O&O – All process wastewater in the DOW ditches and culverts at the O&O Facility is collected in the large, concrete-lined ditch along Second Street. If oil is present it is removed from the water surface by vacuum truck. The wastewater is then merged with the sanitary wastewater and finally pumped from an effluent sump underground to the JWWTP. If oil reaches the suction bay of the pumps discharging to JWWTP, it is vacuumed and returned to tankage.

In the event of a large spill that exceeds the containment capacity of the ditches or sewer system, the total wastewater flow from this area can be diverted to the approximately 6.5 million gallon north impoundment, which is designated for emergency wastewater collection. Vacuum trucks will be used to remove oil from the impoundment prior to discharge to the JWWTP. If the north impoundment pond is full or not available to contain the contaminated water, it will be diverted to the stormwater reservoir.

PO/MTBE – Spills outside of or escaping secondary containment are contained in ditches, which drain to the DOW contaminated water pond, which continuously flows to the JWWTP. All process wastewater in the DOW ditches and sanitary sewer at the PO/MTBE Facility is sent to the JWWTP for treatment.

RBF – Spills within the process area secondary containment are contained in a concrete lined ditch and subsequently and returned via vacuum truck to tankage or alternate temporary storage facilities for disposal or recycling as appropriate. All process wastewater and sanitary sewer at the RBF Facility is sent to the JWWTP for treatment. Spills outside of or escaping secondary containment are contained in ditches, which drain to the Outfall #801 ditch which is authorized under the JWWTP TPDES Industrial Wastewater Discharge Permit. Access roads and spill containment boom placement sites are available in multiple locations along this drainage. Additionally, earth moving equipment and contracts are in place to construct underflow/overflow dams as necessary to contain spilled oil.

JWWTP - If oil reaches the JWWTP, steps will be taken to remove the oil. The JWWTP operators are instructed to contact the Boiler House at the O&O facility in case of any difficulties with the facility's wastewater. The JWWTP is equipped with an 8-million gallon equalization basin, which treats wastewaters from the O&O and PO/MTBE facilities, and other facilities not owned or operated by Huntsman PNPP. The 8-million gallon stormwater surge basin collects runoff diverted during heavy rains to avoid overloading the facility. Wastewater treatment continues through two 5.3-million gallon aeration basins, clarifiers, and a 20-million gallon polishing pond. The treated effluent is

discharged through internal TPDES permitted Outfall 301, and thence to final Outfall 001 into the Neches River.

SECTION 5.3 BULK STORAGE CONTAINERS –[40 CFR 112.8.C]

Oil-filled electrical and operating equipment are not considered bulk storage containers as defined at §112(2), therefore the containers at the Huntsman PNPP facilities subject to the requirements of §11(8)(c) are limited to fuels, oils, oily wastewaters, and petroleum-based feedstocks, intermediates, and final products (in storage tanks).

Materials of Construction and Secondary Containment [§112.8.c.1 &2]

All bulk storage containers used at the Huntsman PNPP facilities are constructed of materials compatible with the material stored and the storage conditions (temperature and pressure).

Most bulk storage containers located at the Huntsman PNPP facilities are within local containment structures such as dikes, earthen berms, or concrete basins of adequate volume to hold the entire contents of the largest tank and provide sufficient freeboard to contain a 25-year, 24-hour storm event (approximately 11 inches in Jefferson County). In addition, to ensure effective containment and recovery of released materials all bulk storage containers are located in areas that drain or can be pumped to a wastewater treatment impoundment or system.

A list of bulk storage containers for the O&O, PO/MTBE, RBF, and JWWTP facilities to include the tank identification number, asset number, tank contents, capacity, material and date of construction is provided in **Table 1**. Large storage tanks (>10,000 gallons) have high level alarm systems and smaller tanks have sight gauges and are manned during fill operations.

Drainage of Containment Areas [§112.8.c.3]

The process areas of the O&O, PO/MTBE, and RBF facilities are designed to direct drainage to the JWWTP and not allow bypass of drainage to waters of the state. Drainage of containment areas located outside of the process areas is controlled by manually operated valves, which are normally closed. Accumulated water in these containment areas is visually inspected for signs of oil prior to discharge and supervised by plant personnel to ensure oil is not discharged.

Underground Storage Tanks Buried Pipeline Installations [§112.8.c.4 & 5]

There is one Underground Storage Tank (UST), holding gasoline at the Huntsman PNPP facilities. This tank complies with the applicable UST regulations.

Buried oil transfer pipelines are wrapped appropriately or coated to prevent corrosion. Any sections of buried pipelines that are exposed for any reason are examined carefully for damage and overt

signs of deterioration and/or corrosion before being recovered by operating personnel. If any corrosion damage is found, additional examination and corrective actions are taken as needed based on the magnitude of the damage.

Leak testing of USTs and piping systems is conducted in accordance with Huntsman PNPP procedures outlined in **INSP-GEN-LT3.**

Aboveground Container Testing [§112.8.c.6]

Although a method of physical integrity testing is required in conjunction with visual inspections, the preamble of the rule indicates small containers (55 gallon drums), that pose minimal risk of failure due to corrosion and for which all surfaces are observable, monthly visual inspection is adequate. Therefore, integrity testing of 55-gallon drums of diesel, lubricating oils and used oils will be limited to visual inspection.

Huntsman Procedure **INSP-GEN-VT7** – Inspection of Storage Tanks outlines the requirements and specifies the responsibilities for the internal and external inspection of atmospheric and low-pressure storage tanks. Inspections are performed in accordance with API Standards 650 (Welded Steel Tanks for Oil Storage), 620 (Low Pressure Storage Tanks), and 653 (Tank Inspection, Repair, Alteration, and Reconstruction).

During external inspections, an ultrasonic thickness measurement is made at prescribed Thickness Measurement Locations (TMLs). Each inspection is recorded and compared to previous readings to detect anomalies or to discover corrosion trends. Records of inspections are maintained in the respective units for a period of three years.

Internal Heating Coils [§112.8.c.7]

There are no tanks with exhaust lines from internal heating coils that discharge into an open-water course at any of the Huntsman PNPP facilities.

Fail-Safe Engineering for Tank Installations [§112.8.c.8]

The large volumes of oil that are stored at the Huntsman PNPP facilities require the need for fail-safe engineering to protect against tank overfilling. Automatic tank high level alarm systems are monitored at all times by the process control room personnel. The possibility of significant spills and release events is reduced by the following factors:

- All movements of oil are controlled manually or under direct control of the process control room personnel.
- Tanks and ancillary equipment are inspected regularly and the results are recorded.

- All direct fill tanks, except gasoline and diesel storage, are equipped with high-level alarms that activate automatic pump shutoffs.

Numerous drums are located within units and in various other areas throughout the facilities. Drums are situated so that any spills will be contained within steel containment basins located under the drums or by the facility ditch system. Spills, in either case, will be prevented from leaving facility property.

The main drum storage areas are also protected from discharges off-site by collection within the facility ditch system. No portable tanks or drum storage areas are situated in locations prone to washout or flooding.

All loading, unloading, and facility transfers of oils are conducted according to established operating procedures. Loading/unloading operations are attended by the truck driver and a facility employee at all times. During transfers the driver and the employee are in direct communication at all times.

Treatment Facility Upsets [§112.8.c.9]

The JWWTP is located in an area that is manned 24 hours per day 7 days per week. The waste treatment facilities and the drainage systems that feed the system are observed frequently enough to detect possible system upsets.

Corrective Actions for Visible Leaks [§112.8.c.10]

Any visible discharges observed through routine operator rounds or through tank visual inspections are immediately reported and action is taken to repair leaks and cleanup any accidental discharges. Any accumulation of oil in containment areas is immediately removed using absorbent materials or vacuum truck.

Mobile or Portable Containers [§112.8.c.11]

All containers of oil at the Huntsman PNPP facilities are located within secondary containment and/or located in an area that drains to a wastewater treatment or impoundment system.

Occasionally, portable containers (totes or drums) of oil are temporarily located outside of containment areas or outside of wastewater treatment and impoundment systems areas. These containers will either be placed in portable containment structures, have oil booms placed around them, or have oil booms immediately available onsite that can be placed in ditches nearby to prevent any accidental discharge from reaching navigable waters.

SECTION 5.4 FACILITY TRANSFER OPERATIONS, PUMPING, AND FACILITY PROCESS [40 CFR 112.8.D]

Buried Piping Protection [§112.8.d.1]

Any buried piping installed or replaced on or after August 16, 2002 will be provided with protective wrapping and coating, and will be cathodically protected from corrosion in accordance with 40 CFR Part 280 or 281. Any exposed buried piping will be inspected, and the appropriate corrective action taken if corrosion damage is found as outlined in Huntsman PNPP Procedure **INSP-GEN-VT7**.

Transfer Points-Standby Service [§112.8.d.2]

Flanges, joints, valves and supports are inspected on a regular basis during each shift. In the event the piping is removed from service, appropriate lockout/tag-out procedures are used to ensure pumps are deactivated and lines are capped or blinded to prevent inadvertent pumping of oil.

When in-plant piping is not in service or is in standby service for an extended period of time, the piping is capped or blank-flanged at the terminal connections to prevent inadvertent oil leakage or spillage. Piping is also marked as to its origin to prevent possible product contamination.

Pipe Support Design [§112.8.d.3 &4]

Aboveground piping is readily visible for visual inspection by operations personnel and is loosely constrained with u-bolts that allow slight pipe movements. Pipe support design and the frequent bends in the piping allow for expansion and contraction without creating unacceptable stress or abrasive movement.

Vehicular Traffic Warning [§112.8.d.5]

Vehicle drivers entering the PNPP facilities are verbally warned and signs are posted warning vehicular traffic of clearance levels. In addition, aboveground piping is further protected by Huntsman PNPP traffic rules restricting vehicles to designated roads from which exposed pipelines/piping are protected by permanent yellow pipe barricades. All vehicles at Huntsman PNPP facilities must obey all traffic signs and restrictions. In addition, facility personnel capable of warning vehicular traffic attend all transfer operations.

CHAPTER 6: RESPONSE REQUIREMENTS

[40 CFR 112.20 & 21]

SECTION 6.1 FACILITY RESPONSE PLANS [40 CFR 112.20]

The Substantial Harm Criteria Applicability Forms are provided in **Section 1.2** of the Huntsman PNPP Integrated Contingency Plan. Therefore, Huntsman PNPP has addressed the facility response planning requirements of 40 CFR 112.20 in the Huntsman PNPP ICP for all the facilities covered under this SPCC Plan.

SECTION 6.2 FACILITY RESPONSE TRAINING AND DRILLS/EXERCISES [40 CFR 112.21]

Spill prevention training is addressed in **Section 4.12** of the Huntsman PNPP ICP. However, since the Huntsman PNPP facilities have the potential to cause substantial harm in the event of an oil discharge, Huntsman has also prepared and implemented a response-training program and a drill/exercise program. The elements of these programs are addressed in the Huntsman PNPP ICP.

APPENDIX A: IMPLEMENTATION ACTION ITEMS

During development of the SPCC Plan, the following areas of concern were noted regarding changes that must be implemented at Huntsman Port Neches Performance products facilities to comply with the SPCC Plan requirements cited at 40 CFR 112. The facility changes must be implemented no later than March 31, 2008, to comply with the current SPCC regulations. The proposed implementation schedule provides Huntsman sufficient time to prepare for and implement the modifications.

Certification of the SPCC Plan by a Professional Engineer is contingent upon implementation of these facility upgrades to comply with the regulations and provide the facility adequate spill prevention and control measures.

ITEM 1 GENERAL SECONDARY CONTAINMENT REQUIREMENT [40 CFR 112.7.C]

40 CFR 112.7.C – PROVIDE APPROPRIATE CONTAINMENT AND/OR DIVERSIONARY STRUCTURES OR EQUIPMENT TO PREVENT A DISCHARGE AS DESCRIBED IN §112.1(B). THE ENTIRE CONTAINMENT SYSTEM, INCLUDING WALLS AND FLOOR, MUST BE CAPABLE OF CONTAINING OIL AND MUST BE CONSTRUCTED SO THAT ANY DISCHARGE FROM A PRIMARY CONTAINMENT SYSTEM, SUCH AS A TANK OR PIPE, WILL NOT ESCAPE THE CONTAINMENT SYSTEM BEFORE CLEANUP OCCURS.

Recommended Action

Provide or extend secondary containment for each listed storage tank and rail loading operation as presented in the following table:

Tank ID	Containment Modification
A46	Provide additional 416 gallon containment
A63	Provide additional 730 gallon containment
A64	Provide additional 326 gallon containment

A65	Provide additional 730 gallon containment
A66	Provide additional 230 gallon containment
A79	Provide 600 gallon containment
RBF Tank Farm	Complete Berm Inner Surface installation and re-survey to confirm adequate volume remains following inner surface placement
RBF Rail Load/Unload Racks	Install track pans per design for Tank Car Loading positions; Install valve on south load rack diversion/retention basin and increase containment capacity of north and south basins.

Responsible Party: _____

Completion Date: _____

Completed By: _____

Description of Action Taken:

_____

_____