

**Section 1: Identification of the substance or mixture and of the supplier**

<b>Product Name:</b>	Crude Oil, Sour (Canada)
<b>SDS Number:</b>	778819
<b>Synonyms/Other Means of Identification:</b>	Crude Petroleum
<b>MARPOL Annex I Category:</b>	Crude Oils
<b>Intended Use:</b>	Refinery Feed
<b>Manufacturer:</b>	ConocoPhillips Canada Limited or its Affiliates PO Box 130, 401 9th Ave. SW Calgary, Alberta T2P 2H7 Canada
<b>Emergency Health and Safety Number:</b>	Chemtrec: 800-424-9300 (24 Hours) CANUTEC (613) 996-6666
<b>Customer Service:</b>	403-233-4000
<b>Technical Information:</b>	403-233-4000
<b>SDS Information:</b>	Phone: 855-244-0762 Email: SDS@conocophillips.com URL: www.conocophillips.com

**Section 2: Hazard(s) Identification****Classification**

H224 -- Flammable liquids -- Category 1  
H304 -- Aspiration Hazard -- Category 1  
H319 -- Eye damage/irritation -- Category 2  
H336 -- Specific target organ toxicity (single exposure) -- Category 3  
H350 -- Carcinogenicity -- Category 1B  
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2  
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

**Hazards not Otherwise Classified**

May contain or release poisonous hydrogen sulfide gas

**Label Elements****DANGER**

Extremely flammable liquid and vapor. (H224)\*

Causes serious eye irritation. (H319)\*

May be fatal if swallowed and enters airways. (H304)\*

May cause drowsiness or dizziness. (H336)\*

May cause damage to organs through prolonged or repeated exposure. (H373)\*

May cause cancer. (H350)\*

Toxic to aquatic life with long lasting effects. (H411)\*

May contain or release poisonous hydrogen sulfide gas.

### **Precautionary Statement(s):**

Obtain special instructions before use. (P201)\*  
Do not handle until all safety precautions have been read and understood. (P202)\*  
Keep away from heat/sparks/open flames/hot surfaces. - No smoking. (P210)\*  
Keep container tightly closed. (P233)\*  
Ground/bond container and receiving equipment. (P240)\*  
P241: Use explosion-proof electrical/ventilating/lighting equipment  
Use only non-sparking tools. (P242)\*  
Take precautionary measures against static discharge. (P243)\*  
Avoid breathing dust/fume/gas/mist/vapours/spray. (P261)\*  
Wash thoroughly after handling. (P264)\*  
Use only outdoors or in a well-ventilated area. (P271)\*  
Wear protective gloves / protective clothing / eye protection / face protection. (P280)\*  
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. (P361)\* Rinse skin with water/shower. (P353)\*  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338\*)  
If eye irritation persists: Get medical advice/attention. (P313)\*  
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. (P301+P310)\*  
Do NOT induce vomiting. (P331)\*  
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. (P304+P340)\*  
Call a POISON CENTER or doctor/physician if you feel unwell. (P312)\*  
In case of fire: Use dry chemical, carbon dioxide, or foam for extinction.(P370+P378)\*  
Store locked up. (P405)\*  
Store in a well-ventilated place. Keep cool.(P403+P235)\*  
Dispose of contents/container to approved disposal facility. (P501)\*

*\*(Applicable GHS hazard code.)*

## **Section 3: Composition / Information on Ingredients**

<b>Component</b>	<b>CASRN</b>	<b>Concentration<sup>1</sup></b>
Crude Oil (Petroleum)	8002-05-9	100
Naphthalene	91-20-3	0-0.9
Benzene	71-43-2	<1
Hydrogen Sulfide	7783-06-4	<1

**Total Sulfur:** > 0.5 wt%

<sup>1</sup> All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Crude oil, natural gas and natural gas condensate can contain minor amounts of sulfur, nitrogen and oxygen containing organic compounds as well as trace amounts of heavy metals like mercury, arsenic, nickel, and vanadium. Composition can vary depending on the source of crude.

## **Section 4: First Aid Measures**

**Eye Contact:** For direct contact, remove contact lenses if present and easy to do. Immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 20 minutes. Seek immediate medical attention.

**Skin Contact:** Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

**Inhalation (Breathing):** If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

**Ingestion (Swallowing):** Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

### Most important symptoms and effects

**Acute:** Headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue.

**Delayed:** Dry skin and possible irritation with repeated or prolonged exposure.

**Notes to Physician:** At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% NaNO<sub>2</sub> solution (0.5 gm NaNO<sub>2</sub> in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

**Other Comments:** Before attempting rescue, first responders should be alert to the possible presence of hydrogen sulfide, a poisonous gas with the smell of rotten eggs, and should consider the need for respiratory protection (see Section 8). Remove casualty to fresh air as quickly as possible. Immediately begin artificial respiration if breathing has ceased. Consider whether oxygen administration is needed. Obtain medical advice for further treatment.

## Section 5: Fire-Fighting Measures



### NFPA 704 Hazard Class

**Health:** 2    **Flammability:** 3    **Instability:** 0    (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

**Unusual Fire & Explosion Hazards:** Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

**Extinguishing Media:** Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

**Fire Fighting Instructions:** Long-duration fires involving crude or residual fuel oil stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11 or API 2021).

For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

**Hazardous Combustion Products:** Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Hydrogen sulfide and oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

## Section 6: Accidental Release Measures

**Personal Precautions:** Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. May contain or release poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H<sub>2</sub>S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

**Environmental Precautions:** Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

**Methods for Containment and Clean-Up:** Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

## Section 7: Handling and Storage

**Precautions for safe handling:** Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. May contain or release dangerous levels of hydrogen sulfide. Do not breathe vapors or mists. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Mercury and other heavy metals may be present in trace quantities in crude oil, raw natural gas, and condensates. Production and processing of these materials can lead to "drop-out" of elemental mercury in enclosed vessels and pipe work, typically at the low point of any process equipment because of its density. Mercury may also occur in other process system deposits such as sludges, sands, scales, waxes, and filter media. Personnel engaged in work with equipment where mercury deposits might occur (confined space entry, sampling, opening drain valves, draining process lines, etc), may be exposed to a mercury hazard (see sections 3 and 8).

**Conditions for safe storage:** Keep container(s) tightly closed and properly labeled. This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H<sub>2</sub>S, and flammability prior to entry. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

## Section 8: Exposure Controls / Personal Protection

Component	ACGIH	OSHA	Other
Crude Oil (Petroleum)	---	---	TWA: 100 mg/m <sup>3</sup> - 8 hr (ConocoPhillips Guidelines)
Naphthalene	STEL: 15 ppm TWA: 10 ppm 2 ppm TWA; skin; A3 - confirmed animal carcinogen with unknown relevance to humans; TLV basis: upper respiratory tract irritation Skin	TWA: 10 ppm : 50 mg/m <sup>3</sup>	TWA: 0.2 mg/m <sup>3</sup> (as total of 17 PNA"s measured by NIOSH Method 5506) (ConocoPhillips Guidelines)
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 10 ppm TWA: 1 ppm	---
Hydrogen Sulfide	STEL: 5 ppm TWA: 1 ppm	Ceiling: 20 ppm	TWA: 5 ppm 8hr TWA: 2.5 ppm 12hr STEL: 15 ppm (ConocoPhillips Guidelines)

**Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.**

**Engineering controls:** If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

**Eye/Face Protection:** The use of eye protection (such as splash goggles) that meets or exceeds ANSI Z.87.1 is recommended when there is potential liquid contact to the eye. Depending on conditions of use, a face shield may be necessary.

**Skin/Hand Protection:** The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

**Respiratory Protection:** Where there is potential for airborne exposure to hydrogen sulfide (H<sub>2</sub>S) above exposure limits, a NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used. Under conditions where hydrogen sulfide (H<sub>2</sub>S) is NOT detected, a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

Workplace monitoring plans should consider the possibility that heavy metals such as mercury may concentrate in processing vessels and equipment presenting the possibility of exposure during various sampling and maintenance operations. Implement appropriate respiratory protection and the use of other protective equipment as dictated by monitoring results (See Sections 2 and 7).

**Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.**

## Section 9: Physical and Chemical Properties

**Note:** Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

<b>Appearance:</b>	Amber to Black
<b>Physical Form:</b>	Liquid
<b>Odor:</b>	Petroleum. Rotten egg / sulfurous
<b>Odor Threshold:</b>	No data
<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	00.6-10 psia (Reid VP) @ 100°F / 37.8°C
<b>Vapor Density (air=1):</b>	>1
<b>Initial Boiling Point/Range:</b>	-128 to >1000 -89 to >538 °C
<b>Melting/Freezing Point:</b>	No data
<b>Solubility in Water:</b>	Negligible
<b>Partition Coefficient (n-octanol/water) (Kow):</b>	No data
<b>Specific Gravity (water=1):</b>	0.7-1.03 @ 60°F (15.6°C)
<b>Bulk Density:</b>	5.83-8.58 lbs/gal
<b>Evaporation Rate (nBuAc=1):</b>	No data
<b>Flash Point:</b>	< 20 °F / < -7 °C
<b>Test Method:</b>	(estimate)
<b>Lower Explosive Limits (vol % in air):</b>	1.1
<b>Upper Explosive Limits (vol % in air):</b>	6.0
<b>Auto-ignition Temperature:</b>	590 °F / 310 °C

## Section 10: Stability and Reactivity

**Stability:** Stable under normal ambient and anticipated conditions of use.

**Conditions to Avoid:** Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

**Materials to Avoid (Incompatible Materials):** Avoid contact with strong oxidizing agents and strong reducing agents.

**Hazardous Decomposition Products:** Not anticipated under normal conditions of use.

**Hazardous Polymerization:** Not known to occur.

## Section 11: Toxicological Information

### Information on Toxicological Effects of Substance/Mixture

<u>Acute Toxicity</u>	<u>Hazard</u>	<u>Additional Information</u>	<u>LC50/LD50 Data</u>
Inhalation	Expected to have a low degree of toxicity by inhalation	May contain or release poisonous hydrogen sulfide gas - see Other Comments.	> 5 mg/L
Skin Absorption	Unlikely to be harmful		> 2 g/kg
Ingestion (Swallowing)	Unlikely to be harmful		> 5 g/kg

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

**Skin Corrosion/Irritation:** Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking.

**Serious Eye Damage/Irritation:** Causes serious eye irritation.

**Signs and Symptoms:** Effects of overexposure may include irritation of the digestive tract, irritation of the respiratory tract, nausea, vomiting, diarrhea and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

**Skin Sensitization:** Not expected to be a skin sensitizer.

**Respiratory Sensitization:** No information available.

**Specific Target Organ Toxicity (Single Exposure):** May cause drowsiness and dizziness.

**Specific Target Organ Toxicity (Repeated Exposure):** May cause damage to organs through prolonged or repeated exposure. Laboratory animal studies of crude oil by the dermal and inhalation exposure routes have demonstrated toxicity to the liver, blood, spleen and thymus

**Carcinogenicity:** May cause cancer. Chronic application of crude oil to mouse skin resulted in an increased incidence of skin tumors. IARC concluded in its Crude Oil Monograph that there is limited evidence of carcinogenicity in animals, and that crude oil is not classifiable as to its carcinogenicity in humans (Group 3). It has not been listed as a carcinogen by NTP or OSHA.

**Germ Cell Mutagenicity:** Inadequate information available.

**Reproductive Toxicity:** Inadequate information available. Dermal exposure to crude oil during pregnancy resulted in limited evidence of developmental toxicity in laboratory animals. Decreased fetal weight and increased resorptions were noted at maternally toxic doses. No significant effects on pup growth or other developmental landmarks were observed postnatally.

**Other Comments:** This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

This material may contain varying concentrations of polycyclic aromatic hydrocarbons (PAHs) which have been known to produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn, and is temporary in duration if exposure is discontinued. Continued exposure to sunlight can result in more serious skin problems including pigmentation (discoloration), skin eruptions (pimples), and possible skin cancers.

### Information on Toxicological Effects of Components

#### n-Hexane

**Target Organs:** Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

**Reproductive Toxicity:** Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

#### **Xylenes**

**Target Organs:** Rats exposed to xylenes at 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

**Reproductive Toxicity:** Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions, but no evidence of teratogenicity.

#### **Ethyl Benzene**

**Carcinogenicity:** Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC.

**Target Organs:** In rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study there was mild damage to the kidney (tubular hyperplasia), liver (eosinophilic foci, hypertrophy, necrosis), lung (alveolar epithelium metaplasia), thyroid (hyperplasia), thyroid (hyperplasia) and pituitary (hyperplasia). In animal models (particularly rats), ethyl benzene affects the auditory function mainly in the cochlear mid-frequency range and ototoxicity was observed after combined exposure to noise and ethyl benzene. There is no evidence of either ethyl benzene-induced hearing losses or ototoxicity with combined exposure to ethyl benzene and noise in workers.

#### **Naphthalene**

**Carcinogenicity:** Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

#### **Benzene**

**Carcinogenicity:** Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

**Target Organs:** Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

**Reproductive Toxicity:** Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

**Germ Cell Mutagenicity:** Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

## **Section 12: Ecological Information**

**Toxicity:** Experimental studies of acute aquatic toxicity show values for crude oil in the range of 2 to over 100 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. Crude oil should be regarded as harmful to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H411; Chronic Cat 2.

**Persistence and Degradability:** Most crude oils are not regarded as readily biodegradable. Most of the non-volatile constituents are inherently biodegradable; some of the highest molecular weight components are persistent in water.

**Persistence per IOPC Fund definition:** Persistent

**Bioaccumulative Potential:** Log Kow values measured for the hydrocarbon components of this material range from less than 2 to greater than 6, and therefore would be regarded as having the potential to bioaccumulate.



**Mobility in Soil:** Crude oil spreads as a film on the surface of water, facilitating loss of its lighter components by volatilization. In air, the volatile hydrocarbons undergo photodegradation by reaction with hydroxyl radicals with half-lives varying from 0.5 days for n-dodecane to 6.5 days for benzene. The lower molecular weight aromatic hydrocarbons and some polar compounds have low but significant water solubility. Some higher molecular weight compounds are removed by emulsification and these also slowly biodegrade; others adsorb to sediment and sink. A further removal process from water involving the heavier fraction is agglomeration to form tars, some of which sink.

**Other Adverse Effects:** None anticipated.

## Section 13: Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

### EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

## Section 14: Transport Information

### Canadian (TDG)

<b>Shipping Description:</b>	<i>Shipping description only valid if vapor pressure is <math>\leq</math> 300 kPa (43.5 psia) at 50° C (122 °F). If not, Call 800-762-0942 for assistance.</i> UN1267, Petroleum crude oil, 3, I or II
<b>Small Means of Containment</b>	
<b>Package Marking:</b>	UN1267, Petroleum crude oil
<b>Package Labeling:</b>	Flammable liquids
<b>Large Means of Containment</b>	
<b>Package Placard/Marking:</b>	Flammable liquids / 1267
<b>Emergency Response Guide:</b>	128
<b>Note:</b>	<i>Packing group is dependent on boiling point (BP) of the material: I if BP <math>\leq</math> 35° C; II if BP &gt; 35° C</i>

### U.S. Department of Transportation (DOT)

<b>Shipping Description:</b>	<i>Shipping description only valid if vapor pressure is <math>\leq</math> 300 kPa (43.5 psia) at 50° C (122 °F). If not, Call 800-762-0942 for assistance.</i> UN1267, Petroleum crude oil, 3, I or II
<b>Non-Bulk Package Marking:</b>	Petroleum crude oil, UN1267
<b>Non-Bulk Package Labeling:</b>	Flammable liquid
<b>Bulk Package/Placard Marking:</b>	Flammable / 1267
<b>Packaging - References:</b>	49 CFR 173.150; 173.201; 173.243 [ PG I ] -or- 49 CFR 173.150; 173.202; 173.242 [ PG II ] <i>(Exceptions; Non-bulk; Bulk)</i>
<b>Hazardous Substance:</b>	See Section 15 for RQ's
<b>Emergency Response Guide:</b>	128

**Note:** *Packing group is dependent on boiling point (BP) of the material:  
 I if BP <=35° C (95° F); II if BP > 35° C (95° F)*

*The following alternate shipping description order may be used until January 1, 2013:  
 Proper Shipping name, Hazard Class or Division, (Subsidiary Hazard if any), UN or NA number, Packing Group  
 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable  
 Other shipping description elements may be required for DOT compliance.*

**International Maritime Dangerous Goods (IMDG)**

**Shipping Description:** UN1267, Petroleum crude oil, 3, I or II, ( FP° C cc), [where FP is the material's flash point in degrees Celsius closed cup]  
**Non-Bulk Package Marking:** Petroleum crude oil, UN1267  
**Labels:** Flammable liquid  
**Placards/Marking (Bulk):** Flammable / 1267  
**Packaging - Non-Bulk:** P001  
**EMS:** F-E, S-E  
**Note:** *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25. If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.*

**International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)**

**UN/ID #:** UN1267  
**Proper Shipping Name:** Petroleum crude oil  
**Hazard Class/Division:** 3  
**Subsidiary risk:** None  
**Packing Group:** I or II  
**Non-Bulk Package Marking:** Petroleum crude oil, UN1267  
**Labels:** Flammable liquid  
**ERG Code:** 3H  
**Note:** *U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.*

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
<b>Packaging Instruction #:</b>	<i>Forbidden - [ PG I ]</i>	351 - [ PG I ]	361 - [ PG I ]
	<i>Y341 - [ PG II ]</i>	353 - [ PG II ]	364 - [ PG II ]
<b>Max. Net Qty. Per Package:</b>	<i>Forbidden - [ PG I ]</i>	1L - [ PG I ]	30 L - [ PG I ]
	<i>1L - [PG II ]</i>	5 L - [ PG II ]	60 L - [ PG II ]

**Section 15: Regulatory Information**

**CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):**

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

**CERCLA/SARA - Section 311/312 (Title III Hazard Categories)**

**Acute Health:** Yes  
**Chronic Health:** Yes  
**Fire Hazard:** Yes  
**Pressure Hazard:** No  
**Reactive Hazard:** No

**CERCLA/SARA - Section 313 and 40 CFR 372:**

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration <sup>1</sup>	de minimis
n-Hexane	<5	1.0%
Xylenes	0-3	1.0%

Ethyl Benzene	<2	0.1%
Naphthalene	0-0.9	0.1%
Benzene	<1	0.1%

**EPA (CERCLA) Reportable Quantity (in pounds):**

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

**California Proposition 65:**

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Ethyl Benzene	Cancer
Naphthalene	Cancer
Various Polycyclic Aromatic Hydrocarbons	Skin Cancer
Toluene	Developmental Toxicant Female Reproductive Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

**International Hazard Classification**

**Canada:**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

**WHMIS Hazard Class:**

B2 - Flammable Liquids  
D2A  
D2B

**National Chemical Inventories**

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA  
All components are either on the DSL, or are exempt from DSL listing requirements

**U.S. Export Control Classification Number:** 1C981

**Section 16: Other Information**

**Date of Issue:** 03-Apr-2012  
**Status:** FINAL  
**Previous Issue Date:** 07-Apr-2011  
**Revised Sections or Basis for Revision:** Identified Hazards (Section 2)  
Precautionary Statement(s) (Section 2)  
First Aid (Section 4)  
Shipping information (Section 14)  
Regulatory information (Section 15)  
**SDS Number:** 778819

**Guide to Abbreviations:**

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

**Disclaimer of Expressed and implied Warranties:**

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