

SECTION 1 – MATERIAL IDENTIFICATION AND USE**Material Name:** CRUDE OIL (SOUR)**Use:** Process stream, fuel and lubricants production**WHMIS Classification:** Class B, Div. 2; Class D, Div. 1, Sub-Div. A; Class D, Div. 2, Sub-Div. A and B**Fire:** 4 **Reactivity:** 0 **Health:** 4 **Inventory No.:****TDG:** **UN:** 1267 **Class:** 3**Packing Group:** I (boiling point less than 35 deg. C)

II (boiling point 35 deg. C or above, and flash point less than 23 deg. C)

Shipping Name: PETROLEUM CRUDE OIL (contains Hydrogen Sulphide)**Manufacturer/Supplier:** ENCANA CORPORATION#1800, 855 - 2nd Street S.W., P.O. BOX 2850

CALGARY, ALBERTA, T2P 2S5

Emergency Telephone: 403-645-3333**Chemical Family:** Complex mixture of aliphatic and aromatic hydrocarbons, with dissolved hydrogen sulphide**SECTION 2 – HAZARDOUS INGREDIENTS OF MATERIAL**

Hazardous Ingredients	Approximate Concentrations (%)	C.A.S. Nos.	LD50/LC50 (Incl. Species & Route)	Exposure Limits
Crude oil	100	8002-05-9	LD50, rat, skin, >2 g/kg	5 mg/m ³ (OEL, TLV)
Benzene	0.1	71-43-2	LD50, rat, oral, 930 mg/kg LC50, rat, 4 hr, 13200 ppm	0.5 ppm (OEL) 0.5 ppm (TLV)
Hydrogen sulphide	>20ppm	7783-06-04	LC50, rat, 4 hrs, 444 ppm	10, 1 ppm (OEL, TLV)

OEL = 8 hr. Alberta Occupational Exposure Limit; TLV = Threshold Limit Value (8 hrs)

SECTION 3 – PHYSICAL DATA FOR MATERIAL**Physical State:** Liquid**Specific Gravity:** 0.7- 0.95**Vapour Density (air=1):** 2.5 - 5.0**Percent Volatiles, by volume:** N.Av.**pH:** N.Av.**Coefficient of Water/Oil Distribution:** <0.1**Odour & Appearance:** brown/black/green viscous liquid, rotten eggs odour

(N.A.V. = not available N.App. = not applicable)

Vapour Pressure (mmHg): 0.5-14000 @ 20 deg. C.**Odour Threshold (ppm):** 0.13**Evaporation Rate:** N.Av.**Boiling Pt. (deg.C):** 38-500+**Freezing Pt. (deg.C):** <-40**SECTION 4 – FIRE AND EXPLOSION****Flammability:** Yes **Conditions:** Material will ignite at normal temperatures.**Means of Extinction:** Foam, CO₂, dry chemical. Explosive and toxic gas/vapours can build up in poorly ventilated areas.**Special Procedures:** Use water spray to cool fire-exposed containers, and to disperse vapors if spill has not ignited. If safe to do so, cut off fuel and allow flame to burn out.**Flash Point (deg.C) & Method:** <-40 (TCC)**Upper Explosive Limit (% by vol.):** 44**Lower Explosive Limit (% by vol.):** 0.8**Auto-Ignition Temp. (deg.C):** 260**Hazardous Combustion Products:** Carbon monoxide, carbon dioxide, sulphur oxides**Sensitivity to Impact:** No**Sensitivity to Static Discharge:** Yes, may ignite**TDG Flammability Classification:** 3**SECTION 5 – REACTIVITY DATA****Chemical Stability:** Yes**Conditions:** Heat**Incompatibility:** Yes**Substances:** Oxidizing agents (eg chlorine); H₂S forms sulphides with metals (e.g. iron, copper, lead).**Reactivity:** Yes**Conditions:** Heat, strong sunlight**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, sulphur oxides

SECTION 6 – TOXICOLOGICAL PROPERTIES OF PRODUCT

Routes of Entry:

Skin Absorption: Yes

Skin Contact: Yes (liquid)

Eye Contact: Yes

Inhalation: Acute: Yes

Chronic: Yes

Ingestion: Yes

Effects of Acute Exposure: Initial odour of H₂S detected as low as about 0.1 ppm. Gas/vapour may cause irritation of eyes, nose and throat, dizziness and drowsiness. Hydrogen sulphide may cause a loss of sense of smell at 100 ppm. At higher concentrations, severe irritation of eyes, nose, throat and lungs, dizziness, headache, nausea, unconsciousness and respiratory failure may occur. Death may result if not revived promptly. Repeated contact with skin may cause irritation and possibly dermatitis. Absorbed through intact skin. Contact of liquid with eyes may cause severe irritation.

Effects of Chronic Exposure: Due to presence of benzene and n-hexane, long term exposure may increase the risk of anaemia, leukaemia and nervous system damage.

Sensitization to Product: No.

Exposure Limits of Product: 0.5 ppm Alberta 8 hr OEL for benzene; 10 ppm Alberta 8 hr OEL for H₂S

Irritancy: Yes

Synergistic Materials: None reported

Carcinogenicity: Yes **Reproductive Effects:** Possibly **Teratogenicity:** Possibly **Mutagenicity:** Possibly

SECTION 7 – PREVENTIVE MEASURES

Personal Protective Equipment: Use positive pressure self-contained breathing apparatus or supplied air breathing apparatus where concentrations may exceed exposure limits.

Gloves: Viton (nitrile adequate for short exposure to liquid) **Respiratory:** SCBA or SABA

Eye: SCBA with full facepiece

Footwear: As per safety policy **Clothing:** As per fire protection policy

Engineering Controls: Use only in well ventilated areas. Mechanical ventilation required in confined areas. Equipment must be explosion proof.

Leaks & Spills: Stop leak if safe to do so. Use appropriate personal protective equipment. Use water spray to cool containers. Remove all ignition sources. Provide explosion-proof clearing ventilation, if possible. Prevent from entering confined spaces. Dyke and pump into containers for recycling or disposal. Notify appropriate regulatory authorities.

Waste Disposal: Contact regulatory authorities for disposal requirements.

Handling Procedures & Equipment: Avoid contact with liquid. Avoid inhalation. Bond and ground all transfers. Avoid sparking conditions.

Storage Requirements: Store in a cool, dry, well ventilated area away from heat, strong sunlight and ignition sources.

Special Shipping Information: N.Av.

SECTION 8 – FIRST AID MEASURES

Skin: Flush skin with water, removing contaminated clothing. Get medical attention if irritation persists, or large area of contact. Decontaminate clothing before re-use.

Eye: Immediately flush with large amounts of luke warm water for 15 minutes, lifting upper and lower lids at intervals. Seek medical attention if irritation persists.

Inhalation: Ensure own safety. Remove victim to fresh air. Give oxygen, artificial respiration, or CPR if needed. Seek medical attention immediately.

Ingestion: Give 2-3 glasses of milk or water to drink. DO NOT INDUCE VOMITING. Keep warm and at rest. Get immediate medical attention.

SECTION 9 – PREPARATION DATE OF MSDS

Prepared By: EnCana Environment, Health and Safety (EHS)

Phone Number: (403) 645-2000

Preparation Date: July 1, 2011

Expiry Date: July 1, 2014