

## SECTION 1 – MATERIAL IDENTIFICATION AND USE

**Material Name:** CRUDE OIL (SOUR)  
**Synonyms:** Midale Blend (M or MID); Fosterton (F); Central Alberta Crude (CAL)  
**Use:** Process stream, fuel and lubricants production  
**WHMIS Classification:** Class B, Div. 2; Class D, Div. 1, Sub-Div. A; Div. 2, Sub-Div. A and B  
**NFPA:** **Fire:** 4 **Reactivity:** 0 **Health:** 4  
**TDG Shipping Name:** Petroleum Crude Oil (contains Hydrogen Sulphide)  
**TDG Class:** 3 **UN:** 1267  
**TDG Packing Group:** II (boiling point 35 deg. C or above, and flash point less than 23 deg. C)  
**Manufacturer/Supplier:** CENOVUS ENERGY INC.  
421 - 7 Ave SW PO Box 766  
Calgary, AB T2P 0M5  
**Emergency Telephone:** 1-877-458-8080  
**Chemical Family:** Complex mixture of aliphatic and aromatic hydrocarbons, with dissolved hydrogen sulphide

## SECTION 2 – HAZARDOUS INGREDIENTS OF MATERIAL

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

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

<sup>§</sup>Hydrogen Sulfide in liquid, vapour phase may contain higher concentrations

## SECTION 3 – PHYSICAL DATA FOR MATERIAL

**Physical State:** Liquid **Vapour Pressure (mmHg):** 0.5-14000 @ 20 deg. C.  
**Specific Gravity:** 0.7- 0.95 **Odour Threshold (ppm):** 0.13  
**Vapour Density (air=1):** 2.5 - 5.0 **Evaporation Rate:** N.Av.  
**Percent Volatiles:** N.Av. **Boiling Pt. (deg.C):** 38-500+  
**pH:** N.Av. **Freezing Pt. (deg.C):** <-40  
**Coefficient of Water/Oil Distribution:** <0.1  
**Odour & Appearance:** brown/black/green viscous liquid, rotten eggs odour  
(N.AV. = not available)

## SECTION 4 – FIRE AND EXPLOSION

**Flammability:** Yes **Conditions:** Material will ignite at normal temperatures.  
**Means of Extinction:** Foam, CO<sub>2</sub>, dry chemical. Explosive and toxic 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 **Sensitivity to Impact:** No  
**Lower Explosive Limit (% by vol.):** 0.8 **Sensitivity to Static Discharge:** Yes, may ignite  
**Auto-Ignition Temp. (deg.C):** 260 **TDG Flammability Classification:** 3  
**Hazardous Combustion Products:** Carbon monoxide, carbon dioxide, sulphur oxides

## SECTION 5 – REACTIVITY DATA

**Chemical Stability:** Yes **Conditions:** Heat  
**Incompatibility:** Yes **Substances:** Oxidizing agents (eg chlorine); 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 H<sub>2</sub>S 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 OEL for benzene; 10 ppm OEL for H<sub>2</sub>S

**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 lukewarm 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: Cenovus Energy Inc. Environment, Health and Safety (EHS)

Phone Number: 1-877-458-8080

Preparation Date: March 29, 2011

Expiry Date: March 29, 2014