

## SECTION 1 – MATERIAL IDENTIFICATION AND USE

**Material Name:** HEAVY CRUDE OIL EMULSION  
**Use:** Process stream  
**WHMIS Classification:** Class D, Div. 2, Sub-Div. A and B  
**Fire:** 2 **Reactivity:** 0 **Health:** 3  
**TDG Shipping Name:** N.App.  
**TDG Class:** N.App. **UN:** N.App.  
**TDG Packing Group:** N.App.  
**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.

## SECTION 2 – HAZARDOUS INGREDIENTS OF MATERIAL

Hazardous Ingredients	Approximate Concentrations (%)	C.A.S. Nos.	LD50/LC50 Specify Species & Route	Exposure Limits
Crude oil	30 - 50	8002-05-9	LD50, rat, skin, >2 g/kg	5 mg/m3 (OEL, TLV)
Water	50 - 70			
Benzene	0.01 - 0.1	71-43-2	LD50, rat, oral, 930 mg/kg LC50, rat, 4 hr, 13200 ppm	0.5 ppm (OEL, TLV)
Hydrogen Sulphide	>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 = Threshold Limit Value (8 hrs)

## SECTION 3 – PHYSICAL DATA FOR MATERIAL

**Physical State:** Viscous liquid **Vapour Pressure (mmHg):** N.Av.  
**Specific Gravity:** 0.93 - 1.01 **Odour Threshold (ppm):** N.Av.  
**Vapour Density (air=1):** 2.5 - 5.0 **Evaporation Rate:** N.Av.  
**Percent Volatiles, by volume:** 5 (estimated) **Boiling Pt. (deg.C):** 182 +  
**pH:** N.Av. **Freezing Pt. (deg.C):** <0  
**Coefficient of Water/Oil Distribution:** <0.1  
**Odour & Appearance:** Brown/black viscous liquid/semi-solid, rotten eggs / hydrocarbon odour  
(N.AV. = not available N.App. = not applicable)

## SECTION 4 – FIRE AND EXPLOSION

**Flammability:** Yes **Conditions:** Material will ignite, not at normal temperatures.  
**Means of Extinction:** Foam, CO<sub>2</sub>, dry chemical. Explosive accumulations can build up in areas of poor ventilation.  
**Special Procedures:** Use water spray to cool fire-exposed containers, and to disperse vapors if spill has not ignited. Cut off fuel and allow flame to burn out.  
**Flash Point (deg.C) & Method:** 148 (PMCC)  
**Upper Explosive Limit (% by vol.):** 8 **Sensitivity to Impact:** No  
**Lower Explosive Limit (% by vol.):** 0.8 **Sensitivity to Static Discharge:** Yes, at elevated temperatures  
**Auto-Ignition Temp. (deg.C):** N.Av. **TDG Flammability Classification:** N.App.  
**Hazardous Combustion Products:** Carbon monoxide, carbon dioxide

## SECTION 5 – REACTIVITY DATA

**Chemical Stability:** Stable **Conditions:** Heat  
**Incompatibility:** Yes **Substances:** Oxidizing agents (e.g. chlorine)  
**Reactivity:** Yes **Conditions:** Heat, strong sunlight  
**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide

## SECTION 6 – TOXICOLOGICAL PROPERTIES OF PRODUCT

### Routes of Entry:

**Skin Absorption:** Yes

**Skin Contact:** Yes

**Eye Contact:** Yes

**Inhalation: Acute:** Yes

**Chronic:** Yes

**Ingestion:** Yes

**Effects of Acute Exposure:** Hydrogen sulphide may initially cause irritation of eyes, nose and throat, and then 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. Hydrocarbon vapours may cause irritation of eyes, nose and throat, dizziness and drowsiness. Contact with skin may cause irritation and possibly dermatitis. If material is heated, contact may cause skin burns. Contact of liquid with eyes may cause severe irritation/burns.

**Effects of Chronic Exposure:** Due to presence of benzene, long term exposure may increase the risk of anaemia and leukemia. Repeated skin contact may increase the risk of skin cancer.

**Sensitization to Product:** No.

**Exposure Limits of Product:** 0.5 ppm (OEL for benzene); 10 ppm (OEL for hydrogen sulphide)

**Irritancy:** Yes

**Synergistic Materials:** None reported

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

## SECTION 7 – PREVENTIVE MEASURES

**Personal Protective Equipment:** Wear positive pressure self-contained breathing apparatus or supplied air breathing apparatus.

**Gloves:** Viton (nitrile adequate for short exposure to liquid)

**Eye:** Full facepiece SCBA)

**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 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 appropriate regulatory authorities for disposal requirements.

**Handling Procedures & Equipment:** Avoid contact with liquid. Avoid inhalation. Note: hydrogen sulphide may build up to high concentrations in headspaces of vessels. 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:** Not regulated

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

Phone Number: 1-877-458-8080

Preparation Date: July 10, 2011    Expiry Date: October 15, 2014