

## SECTION 1 – MATERIAL IDENTIFICATION

**Material Name:** HEAVY CRUDE OIL/DILUENT MIX  
**Synonyms:** Bow River (BR); Cold Lake Blend (CLB); Christina Lake Dil-bit Blend (CDB), Christina Lake Blend (CSB); Western Canadian Blend (WCB); Western Canadian Select (WCS); Wabasca Heavy (WH)  
**Use:** Process stream, fuels and lubricants production  
**WHMIS Classification:** Class B, Div. 2, Class D, Div. 2, Sub-Div. A and B  
**NFPA:** **Fire:** 2      **Reactivity:** 0      **Health:** 3  
**TDG Shipping Name:** Petroleum Crude Oil  
**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.  
500 Centre Street SE, PO Box 766  
Calgary, AB T2P 0M5  
**Emergency Telephone:** 1-877-458-8080, CANUTEC 1-613-996-6666 (Canada)  
**Chemical Description:** A naturally occurring mixture of paraffins, naphthalenes, aromatic hydrocarbons and small amounts of sulphur and nitrogen compounds mixed with condensate

## SECTION 2 – HAZARDOUS INGREDIENTS OF MATERIAL

<b>Hazardous Ingredients</b>	<b>Approximate Concentrations (%)</b>	<b>C.A.S. Nos.</b>	<b>LD50/LC50 Specify Species &amp; Route</b>	<b>Exposure Limits</b>
Bitumen	50 – 90	8052-42-4		5 mg/m <sup>3</sup> (OEL, PEL oil mist)
Hydrocarbon Diluent	10 – 50	N.Av.	N.Av.	900 mg/m <sup>3</sup> (OEL)*
Benzene	0.03 - 0.3	71-43-2	LD50, rat, oral, 930 mg/kg LC50, rat, 4 hr, 13200 ppm	0.5 ppm (OEL, TLV) 10 ppm (PEL)
Hydrogen Sulphide <sup>§</sup>	<0.1	7783-06-04	LC50, rat, 4 hrs, 444 ppm	10 ppm (OEL), 1 ppm (TLV), 20 ppm (PEL-C)

OEL = AB Occupational Exposure Limit; TLV = ACGIH Threshold Limit Value; PEL = OSHA Permissible Exposure Limit; C = Ceiling; \*OEL for gasoline; <sup>§</sup>Hydrogen Sulfide in liquid, vapour phase may contain higher concentrations

## SECTION 3 – PHYSICAL DATA FOR MATERIAL

**Physical State:** Liquid      **Vapour Pressure, Reid (kPa):** 76 @ 38°C  
**Specific Gravity:** 0.91 – 0.94      **Odour Threshold (ppm):** N.Av.  
**Vapour Density (air=1):** 2.5 -5.0 (estimated)      **Evaporation Rate:** N.Av.  
**Percent Volatiles, (v/v):** 15 - 30 (estimated)      **Boiling Pt. (deg.C):** 35 – 180°C  
**pH:** N.Av.      **Freezing Pt. (deg.C):** <20  
**Coefficient of Water/Oil Distribution:** <0.1  
**Odour & Appearance:** Brown/black liquid, hydrocarbon odour  
(N.Av. = not available    N.App. = not applicable)

## 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 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:** <-35 (PMCC)  
**Upper Explosive Limit (% by vol.):** 8 (estimated)      **Sensitivity to Impact:** No  
**Lower Explosive Limit (% by vol.):** 0.8 (estimated)      **Sensitivity to Static Discharge:** Yes, at normal temperatures  
**Auto-Ignition Temp. (deg.C):** 250 (estimated)      **TDG Flammability Classification:** 3  
**Hazardous Combustion Products:** Carbon monoxide, carbon dioxide, sulphur oxides

## 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, sulphur oxides

## 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:** Vapour may cause irritation of eyes, nose and throat, dizziness and drowsiness. Contact with skin may cause irritation and possibly dermatitis. 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 anemia 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)

**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, supplied air breathing apparatus or cartridge air purifying respirator approved for organic vapours where concentrations may exceed exposure limits (note: cartridge respirator not suitable for hydrogen sulfide, oxygen deficiency or IDLH situations) – see also Storage below).

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

**Eye:** Chemical splash goggles.    **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. 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 Provisions:** N.App.

**Caution:** Hydrogen sulfide may accumulate in headspaces of tanks and other equipment, even when concentrations in the liquid product are low. Overexposure to hydrogen sulphide may cause dizziness, headache, nausea and possibly unconsciousness and death. Factors increasing this risk include heating, agitation and contact of the liquid with acids or acid salts. Assess the exposure risk by gas monitoring. Wear air supplying breathing apparatus if necessary.

## 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. Health and Safety

Phone Number: 1-403-766-2000

Preparation Date: April 10, 2013