

**SECTION 1 – MATERIAL IDENTIFICATION AND USE****Material Name:** CONDENSATE (SOUR)**Use:** Process stream**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:** II**Shipping Name:** PETROLEUM CRUDE OIL (contains Hydrogen Sulfide)**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); CHEMTREC 1-800-424-9300**Chemical Family:** C5+ aliphatic and aromatic hydrocarbons (natural gasoline), and hydrogen sulfide**SECTION 2 – HAZARDOUS INGREDIENTS OF MATERIAL**

Hazardous Ingredients	Approximate Concentrations (%)	C.A.S. Nos.	LD50/LC50 Specify Species & Route	Exposure Limits
Pentanes	50-60	109-66-0	LC50, rat, 4 hr, 364 g/m <sup>3</sup>	600 ppm (OEL, TLV)
n-Hexane	35-50	110-54-3	LD50, rat, oral, 28.7 g/kg	50 ppm (OEL, TLV)
Butanes	<10	106-97-8	LC50, rat, 4 hrs, 658 g/m <sup>3</sup>	1000 ppm (OEL, TLV <sup>1</sup> )
Benzene	0.1-1	71-43-2	LD50, rat, oral, 930 mg/kg LC50, rat, 4 hr, 13200 ppm	0.5 ppm (OEL, TLV)
Hydrogen sulfide >20ppm		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) <sup>1</sup> As Aliphatic hydrocarbon gases**SECTION 3 – PHYSICAL DATA FOR MATERIAL****Physical State:** Liquid**Specific Gravity:** 0.6-0.7**Vapour Density (air=1):** 2.5 - 3.0**Percent Volatiles, by volume:** 100**pH:** N.Av.**Coefficient of Water/Oil Distribution:** <0.1**Odour & Appearance:** Colorless/straw coloured liquid, hydrocarbon and rotten eggs odour

(N.AV. = not available N.App. = not applicable)

**Vapour Pressure (mmHg):** 600-14000 @ 20 deg. C.**Odour Threshold (ppm):** 0.13**Evaporation Rate:** N.Av.**Boiling Pt. (deg.C):** 40**Freezing Pt. (deg.C):** -129 to -60**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 gas/vapours can build up in poorly ventilated areas.**Special Procedures:** Use water spray to cool fire-exposed containers, and to disperse gas/vapor if spill has not ignited. 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.):** 0.6**Auto-Ignition Temp. (deg.C):** 223**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 **Incompatibility:** Yes **Substances:** Chlorine and other strong oxidizing agents; H<sub>2</sub>S forms sulfides with iron, copper, lead and other metals.**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 at about 0.1 ppm. Gas/vapour may cause irritation of eyes, nose and throat, dizziness and drowsiness. Hydrogen sulfide 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. Contact with skin may cause irritation and possibly dermatitis. Absorbed through intact skin. Contact of liquid with eyes may cause severe irritation and possible damage.

**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 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.App.

## SECTION 8 – FIRST AID MEASURES

**Skin:** Flush skin with water, removing contaminated clothing. Get medical attention if irritation persist, 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. Health and Safety

Phone Number: 1-403-766-2000

Preparation Date: March 14, 2014