

**SECTION 1 – MATERIAL IDENTIFICATION AND USE**

**Material Name:** NATURAL GAS (SOUR)  
**Use:** Process stream, sales gas  
**WHMIS Classification:** Class A; Class B, Div. 1; Class D, Div. 1, Subdiv. A  
**Fire:** 4      **Reactivity:** 0      **Health:** 4      **Inventory No.:**  
**TDG:**      **UN:** 1953      **Class:** 2.3 (2.1)      **Packing Group:** N.Av.  
**Shipping Name:** COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. (contains hydrogen sulphide)  
**Manufacturer/Supplier:** CENOVUS ENERGY INC.  
421 - 7 Ave SW PO Box 766  
Calgary, AB T2P 0M5  
**Emergency Telephone:** 1-877-458-8080  
**Chemical Family:** Mixture of light paraffin hydrocarbon gases, and hydrogen sulfphide

**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>            |
|------------------------------|-------------------------------------|--------------------|--|-----------------------------------|
| Butanes                      | 0 – 10                              | 106-97-8           | LC50, rat, 4 hr., 658 g/m3                   | 1000 ppm (OEL, TLV <sup>1</sup> ) |
| Ethane                       | 0 – 15                              | 74-8-40            | N.Av.  | 1000 ppm (OEL, TLV <sup>1</sup> ) |
| Methane                      | 70 - 90                             | 74-8-28            | N.Av.  | 1000 ppm (TLV <sup>1</sup> )      |
| Propane                      | 0 – 10                              | 74-9-86            | N.Av.  | 1000 ppm (OEL, TLV <sup>1</sup> ) |
| Hydrogen sulphide            | up to 30                            | 7783-06-04         | LC50, rat, 4 hr., 444 ppm                    | 10 ppm (OEL)<br>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:** Gas      **Vapour Pressure:** Gas (usually 300–600 psi in pipeline)  
**Specific Gravity:** 0.3 – 0.6      **Odour Threshold (ppm):** N.Av.  
**Vapour Density (air=1):** 0.5 – 0.94      **Evaporation Rate:** N.Av.  
**Percent Volatiles, by volume:** 100      **Boiling Pt. (deg.C):** -150  
**Odour & Appearance:** colorless, rotten eggs odour      **Freezing Pt. (deg.C):** -180  
**pH:** N.App.      **Coefficient of Water/Oil Distribution:** <0.1  
(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 gas if leak has not ignited. If safe to do so, cut off fuel and allow flame to burn out.  
**Flash Point (deg.C) & Method:** <-150 to 190 deg.C.      **Hazardous Combustion Products:** Carbon monoxide, sulfur oxides  
**Upper Explosive Limit (% by vol.):** 46      **Sensitivity to Impact:** No  
**Lower Explosive Limit (% by vol.):** 3      **Sensitivity to Static Discharge:** Yes, may ignite  
**Auto-Ignition Temp. (deg.C):** 285-537      **TDG Flammability Classification:** 2.1

**SECTION 5 – REACTIVITY DATA**

**Chemical Stability:** Yes      **Conditions:** N.App.  
**Incompatibility:** Yes      **Substances:** Chlorine and other strong oxidizing agents  
**Reactivity:** Yes      **Conditions:** Heat, strong sunlight  
**Hazardous Decomposition Products:** Sulfur oxides, carbon dioxide, carbon monoxide

## SECTION 6 – TOXICOLOGICAL PROPERTIES OF PRODUCT

### Routes of Entry:

**Skin Absorption:** No

**Skin Contact:** Yes

**Eye Contact:** Yes

**Inhalation: Acute:** Yes

**Chronic:** Yes

**Ingestion:** No

**Effects of Acute Exposure:** Initial detection of H<sub>2</sub>S odour at about 0.1 ppm. Irritation of eyes, nose and throat occurs. Hydrogen sulphide may cause loss of sense of smell at about 100 ppm H<sub>2</sub>S. At higher concentrations lung irritation, drowsiness, unconsciousness, respiratory failure, and possible death can occur. Eye contact may cause irritation and swelling. Rapidly expanding gas or vaporized liquid may cause frostbite to skin and eyes. Evidence exists that propane and butane may cause drowsiness and even unconsciousness at concentrations far below those required for oxygen deficiency, for example 10% LEL and above.

**Effects of Chronic Exposure:** H<sub>2</sub>S may cause fatigue, headache, dizziness, and bronchitis.

**Sensitization to Product:** No.

**Exposure Limits of Product:** 10 ppm (H<sub>2</sub>S OEL)

**Irritancy:** Skin and eyes

**Synergistic Materials:** None reported

**Carcinogenicity:** N.Av.

**Reproductive Effects:** N.Av.

**Teratogenicity:** N.Av.

**Mutagenicity:** N.Av.

## SECTION 7 – PREVENTIVE MEASURES

**Personal Protective Equipment:** Use positive pressure self-contained breathing apparatus or supplied air breathing apparatus when entering areas where overexposure may occur.

**Gloves:** Insulated gloves

**Respiratory:** SCBA or SABA

**Eye:** Full facepiece SCBA or SABA

**Footwear:** As per safety policy

**Clothing:** As per fire protection policy

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

**Leaks & Spills:** If safe to do so, stop gas flow. Remove all ignition sources. Provide clearing ventilation if possible. Prevent from entering confined spaces. Use appropriate personal protective equipment. Contact applicable regulatory authorities.

**Waste Disposal:** Controlled burning or venting in accordance with regulatory requirements.

**Handling Procedures & Equipment:** Avoid inhalation. Avoid contact with liquid or liquid cooled equipment. 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:** See Special Provision 38 in TDG Regulations regarding means of containment.

## SECTION 8 – FIRST AID MEASURES

**Skin:** If freeze burn occurs, gently bathe affected area in warm water (38 – 43 deg. C.) Do not rub. Get medical attention.

**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:** Ensuring own safety, remove victim to fresh air. Give oxygen, artificial respiration, or CPR if needed. Seek immediate medical attention.

**Ingestion:** N.App.

## SECTION 9 – PREPARATION DATE OF MSDS

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

Phone Number: 1-403-766-2000

Preparation Date: April 16, 2012 Expiry Date: April 16, 2015