

MATERIAL SAFETY DATA SHEET

WHMIS CLASSIFICATION

Class B2 - Flammable Liquid

Class D2A - Toxic Material

Class D2B - Toxic Material

TDG CLASSIFICATION

PIN Number: **UN1267**

Primary Class: **3.2**

Secondary Class: **N/A**

Packing Group: **III**

Shipping Name: **Petroleum Crude Oil and Condensate**

Canutec Emergency Telephone Number: (613) 996-6666

SECTION 1 – PRODUCT IDENTIFICATION

| | | | |
|---------------------|--|---|---|
| Name: | Crude Oil (Sweet) and Condensate (Sweet) | Manufacturer's/ Supplier's Name: | Vero Energy Inc. |
| Use: | Raw petroleum used as a base for hydrocarbon refining. | Address: | 1400 - 333 – 5th Avenue SW Calgary, Alberta T2P 3B6 |
| Description: | Crude oil and condensate are petroleum hydrocarbon products. | Phone Number: | (403) 218-2063 Toll Free 1-866-709-8376 (Vero) |

SECTION 2 – HEALTH HAZARD INFORMATION

| Exposure Limits: <small>(ACGIH-TLVs 1996)</small> | TLV-TWA (8 hour) | TLV-STEL (15 minute) |
|---|-------------------------|-----------------------------|
|---|-------------------------|-----------------------------|

Petroleum Crude Oil: **Not Established**

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|---------------------------|--|---------------------------------------|
| Benzene: | 0.5 PPM / 1.6 mg/m³ | 2.5 PPM / 8 mg/m³ |
| Toluene (skin): | 50 PPM / 188 mg/m³ | |
| Ethylbenzene: | 100 PPM / 434 mg/m³ | 125 PPM / 543 mg/m³ |
| Xylenes: | 100 PPM / 434 mg/m³ | 150 PPM / 651 mg/m³ |
| Cyclopentane: | 600 PPM / 1720 mg/m³ | |
| Cyclohexane: | 100 PPM / 344 mg/m³ | |
| Methylcyclohexane: | 400 PPM / 1610 mg/m³ | |

Inhalation: Irritation of nose, throat and lungs. May cause drowsiness, headache, nausea, dizziness, fatigue, and unconsciousness. Long term exposure to Benzene, Toluene, Ethylbenzene and Xylenes increase the risk of developing serious cancerous blood diseases.

Skin and Eyes: Prolonged exposure to skin may cause dermatitis. Short-term exposure is expected to cause only slight eye irritation, if any.

Ingestion: Ingestion unlikely.

Toxicological Data: **Gasoline**
(acute toxicity)

Oral Toxicity (rats): LD50: 13600 mg/kg (estimated).

Dermal Toxicity (rabbits): LD50: > 5000 mg/kg (estimated).

Benzene

Oral Toxicity (rats): LD50: 930 mg/kg (estimated).

Dermal Toxicity (rabbits): LD50: > 9400 mg/kg (estimated).

Inhalation Toxicity (rats): LC50: 13229 ppm/4hr (estimated).

Other Toxicological Data: Crude oil contains polycyclic aromatic hydrocarbons, several of which have been identified as carcinogenic to experimental animals. Benzene has been suspected to cause leukemia in humans.

SECTION 3 – PREVENTATIVE MEASURES

Eye Protection: Chemical splash goggles, if possible contact with liquid.

Hand Protection: Nitrile or Viton gloves when handling product.

Protective Clothing: Nitrile or Viton clothing, if possible contact with product. Tyvek protective clothing can be used to prevent all body contact.

Ventilation: General ventilation. Local exhaust, if necessary, to control vapours to allowable limits. The use of explosion-proof mechanical ventilation is recommended whenever this product is used in a confined space.

Other Engineering Controls: Use explosion-proof lighting, controls, and/or equipment.

Handling: Handle as extremely flammable liquid. Electrically ground or bond during pumping or transfer to avoid static accumulation. Avoid inhalation of vapours or mists and minimize contact with skin.

Storage: Store in a cool, well-ventilated area away from direct sunlight. Store away from all ignition sources. Storage containers should be grounded or bonded.

Shipping: Ground/bond containers during pumping or transfer to prevent static accumulation.

Leaks or Spills: Evacuate personnel to upwind. Eliminate all ignition sources. Prevent additional discharge product. Wear Air Purifying Respirators and full protective clothing. Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents. Recover using double insulated explosion-proof pumps or vacuum trucks.

Waste Disposal: Dispose in approved contaminated waste landfill site or licenses waste reclaimer facility. Check with applicable jurisdictions for specific disposal requirements.

SECTION 4 – FIRST AID MEASURES

Inhalation: Evacuate victim to fresh air. Give artificial respiration if breathing stopped. Get medical attention immediately.

Skin Contact: Remove contaminated clothing. Soap and water wash. Launder clothing before reuse. Discard saturated leather articles.

Eye Contact: If contact with liquid, flush eyes with warm water for at least 15 minutes. Get medical assessment if eyes are inflamed.

Ingestion:

NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Quickly transport victim to an emergency care facility.

SECTION 5 – HAZARDOUS INGREDIENTS

| Components | % (Volume) | CAS Number |
|---|------------|--|
| Complex Mixture of aliphatic and aromatic hydrocarbons: | | |
| C2-C6 | 35.6% | |
| C7-C10 | 51% | |
| C11+ | 13.4% | |
| Petroleum Crude Oil/Condensate | 100 | 8002-05-9 |
| Specific Hazardous Compounds | | |
| Benzene | 0.1 – 1 | 71-43-2 |
| Toluene | 0.1 – 1 | 108-88-3 |
| Ethylbenzene | 0.1 – 1 | 100-41-4 |
| Xylene | 1 – 2 | 1330-20-7 95-47-6 108-38-3 106-42-3 |
| Cyclopentane | 0.1 – 1 | 287-92-3 |
| Cyclohexane | 0.1 – 1 | 110-82-7 |
| Methylcyclohexane | 1 – 6 | 108-87-2 |
| H2S | 0 | 7783-06-4 |
| C02 | Trace | 124-38-9 |

SECTION 6 – PHYSICAL DATA

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| Physical State: | Liquid. | Evaporation Rate: (n-butyl acetate = 1) | Not Established. |
| Odour and Appearance: | Dark brown liquid with petroleum odour. | Boiling Point: | -12 – 442°C. (varies). |
| Odour Threshold: (PPM): | Not Established. | pH: | Not Applicable. |
| Density: (@15°C) | 688.4 kg/m3. | Solubility in Water: | Negligible. |

SECTION 7 – REACTIVITY DATA

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| Stability: | Stable under normal storage and use. |
| Incompatibility with Other Substances: | Strong oxidizing agents such as chlorine, peroxides, nitrates, sulfuric acid, nitric acid, etc. |
| Conditions to Avoid: | Excessive heat, sources of ignition and build-up of static electricity. |
| Hazardous Decomposition Products: | Carbon Monoxide (CO), Carbon Dioxide (CO ₂) and oxides of Nitrogen. |

SECTION 8 – FIRE AND EXPLOSION DATA

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| Flashpoint and Method Used: | < 4°C (COC) (varies with crude oil and condensate). |
| Autoignition Temperature: | > 260°C (varies with crude oil and condensate). |
| Flammable Limits in Air: (% by Volume) | Lower – Not Established Upper – Not Established |
| Sensitivity to Impact: | Not Applicable. |
| Sensitivity to Static Discharge: | May accumulate static charges during transfer of liquid from one container to another creating an ignition source. |
| Fire and Explosion Hazards: | Material will ignite very easily by flame or spark at normal temperatures. Vapours are heavier than air and may travel considerable distances to sources of ignition and flash back. |
| Extinguishing Agents: | CAUTION: This product has a very low flash point: Use of water spray when fighting fire may be inefficient. SMALL FIRES: Dry chemical, CO ₂ , water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. |
| Fire Fighting Procedures: | Isolate fuel source. SCBA and full protective equipment should be used for all fires. Stop flow and contain spill. Use water spray or fog to cool fire exposed containers and to protect personnel. Isolate all sources of ignition. Cover fire with extinguishing agent. Do not use water jet. |
| Hazardous Combustion Products: | Smoke, Carbon Monoxide (CO), Carbon Dioxide (CO ₂), metal oxides, and oxides of Nitrogen. |

SECTION 9 – PREPARATION INFORMATION

Prepared by: SDS Consulting Corporation

Issued by: Vero Energy Inc.
1400 - 333 – 5th Avenue SW
Calgary, Alberta
T2P 3B6

Telephone Number: (403) 218-2063
Toll Free
1-866-709-8376 (Vero)

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Supersedes: Not Applicable

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