

## Material Safety Data Sheet

According to the Controlled Product Regulations

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### 1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Middle Distillate  
Uses : Refinery stream.  
Product Code : 002D2307

Manufacturer/Supplier : Shell Canada Products  
400 - 4th Avenue S.W  
Calgary AB T2P 0J4  
Canada

Telephone : (+1) 8006611600  
Fax : (+1) 4033848345

#### Emergency Telephone Number

: Shell Canada: (+1) 800-661-7378  
CANUTEC (24 hr): (+1) 613-996-6666

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### 2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS No. : 68955-27-1

#### WHMIS Controlled Ingredients

Chemical Identity	CAS No.	Conc. W/W
Distillates (petroleum), petroleum residues vacuum	68955-27-1	100.00 %

Contains hydrogen sulphide, CAS # 7783-06-4.

Hydrogen sulphide may be present both in the liquid and the vapour. Composition is complex and varies with the source of the crude oil.

Heavy Fuel Oils are blends of residual fuels and distillate streams which always require heating before use.

Refer to Chapter 8 for Occupational Exposure Guidelines.

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### 3. HAZARDS IDENTIFICATION



WHMIS Class/Description : Class B3 Combustible Liquid  
Class D2A Other Toxic Effects - Carcinogen  
Class D2A Other Toxic Effects - Embryotoxic/Fetotoxic

Class D2B Other Toxic Effects - Blood, Thymus, Liver.

Health Hazards : Hydrogen sulphide is highly toxic and may be fatal if inhaled.  
Hydrogen sulphide (H<sub>2</sub>S), an extremely flammable and toxic

## Material Safety Data Sheet

### Signs and Symptoms

gas, and other hazardous vapours may evolve and collect in the headspace of storage tanks, transport vessels and other enclosed containers. May dull the sense of smell, so do not rely on odour as an indication of hazard. Harmful by inhalation. Repeated exposure may cause skin dryness or cracking. Harmful: danger of serious damage to health by prolonged exposure in contact with skin. Possibility of organ or organ system damage from prolonged exposure; see Chapter 11 for details. Target organ(s): Blood. Thymus. Liver. May cause cancer. Possible risk of harm to the unborn child.

### Safety Hazards

: H<sub>2</sub>S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H<sub>2</sub>S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H<sub>2</sub>S will accumulate in the body tissue after repeated exposure. Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance.

: Not classified as flammable but will burn. Flammable vapours may be present even at temperatures below the flash point. Therefore it should be treated as a potentially flammable liquid. May ignite on surfaces at temperatures above auto-ignition temperature. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.

### Environmental Hazards

: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

### Additional Information

: This product is intended for use in closed systems only.

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## 4. FIRST AID MEASURES

### General Information

: Vaporisation of H<sub>2</sub>S that has been trapped in clothing can be dangerous to rescuers. Maintain respiratory protection to avoid contamination from the victim to rescuer. Mechanical ventilation should be used to resuscitate if at all possible.

### Inhalation

: Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

### Skin Contact

: Cold product - Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention. Hot product - If contact with hot product, cool the burn area by

Effective Date 2015-02-18

## Material Safety Data Sheet

According to the Controlled Product Regulations

flushing with large amounts of water. Do not attempt to remove anything from the burn area or apply burn creams or ointments. Cover the burn area loosely with a sterile dressing, if available. Transport to the nearest medical facility for additional treatment.

### Eye Contact

: Cold product - Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention. Hot product - If contact with hot product, cool the burn area by flushing with large amounts of water. Do not attempt to remove anything from the burn area or apply burn creams or ointments. Cover the burn area loosely with a sterile dressing, if available. Transport to the nearest medical facility for additional treatment.

### Ingestion

: If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Give nothing by mouth.

### Advice to Physician

: Hydrogen sulphide (H<sub>2</sub>S) - CNS asphyxiant. May cause rhinitis, bronchitis and occasionally pulmonary oedema after severe exposure. CONSIDER: Oxygen therapy. Consult a Poison Control Center for guidance. Exposure to hydrogen sulphide at concentrations above the recommended occupational exposure standard may cause headache, dizziness, irritation of the eyes, upper respiratory tract, mouth and digestive tract, convulsions, respiratory paralysis, unconsciousness and even death. Call a doctor or poison control center for guidance.

## 5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point	: 110 °C / 230 °F (ASTM D-93 / PMCC)
Upper / lower	: Typical 0.50 - 5.00 % (V)
Flammability or Explosion limits	
Auto Ignition temperature	: 350 °C / 662 °F
Hazardous Combustion Products and Specific Hazards	: Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Oxides of nitrogen. Oxides of sulphur. Unidentified organic and inorganic compounds. Flammable vapours may be present even at temperatures below the flash point. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Sinks in fresh water, floats on sea water and may reignite on water surface. Hydrogen sulphide (H <sub>2</sub> S) and toxic sulphur oxides may be given off when this material is heated. Do not depend on sense of smell for warning.
Suitable Extinguishing Media	: Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	: Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to

Effective Date 2015-02-18

According to the Controlled Product Regulations

## Material Safety Data Sheet

- Protective Equipment for Firefighters** : Wear full protective clothing and self-contained breathing apparatus.
- Additional Advice** : Keep adjacent containers cool by spraying with water. If possible remove containers from the danger zone. If the fire cannot be extinguished the only course of action is to evacuate immediately.
- be avoided as water destroys the foam.

## 6. ACCIDENTAL RELEASE MEASURES

- Protective Measures** : May Ignite on surfaces at temperatures above auto-ignition temperature. Do not breathe fumes, vapour. Do not operate electrical equipment. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Clean Up Methods** : For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. Shovel into a suitable clearly marked container for disposal or reclamation in accordance with local regulations.
- Additional Advice** : Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained. Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

## 7. HANDLING AND STORAGE

- General Precautions** : Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Properly

Effective Date 2015-02-18

According to the Controlled Product Regulations

## Material Safety Data Sheet

dispose of any contaminated rags or cleaning materials in order to prevent fires. Prevent spillages. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.

Maintenance and Fuelling Activities - Avoid inhalation of vapours and contact with skin.

### Handling

- : The inherent toxic and olfactory (sense of smell) fatiguing properties of hydrogen sulphide require that air monitoring alarms be used if concentrations are expected to reach harmful levels such as in enclosed spaces, heated transport vessels and spill or leak situations. If the air concentration exceeds 50 ppm, the area should be evacuated unless respiratory protection is in use. Avoid prolonged or repeated contact with skin. When using do not eat or drink. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Earth all equipment.

### Storage

- : Drum and small container storage: Drums should be stacked to a maximum of 3 high. Use properly labelled and closeable containers. Prevent ingress of water. Tank storage: Tanks must be specifically designed for use with this product. Bulk storage tanks should be diked (bunded). Locate tanks away from heat and other sources of ignition. Tanks should be fitted with heating coils. Ensure heating coils are always covered with product (minimum 15 cm).

### Product Transfer

- : Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling.

### Recommended Materials

- : For containers, or container linings use mild steel, stainless steel. Aluminium may also be used for applications where it does not present an unnecessary fire hazard. Examples of suitable materials are: high density polyethylene (HDPE) and Viton (FKM), which have been specifically tested for compatibility with this product. For container linings, use amine-adduct cured epoxy paint. For seals and gaskets use: graphite, PTFE, Viton A, Viton B.

### Unsuitable Materials

- : Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However, some may be suitable for glove materials.

### Container Advice

- : Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

### Additional Information

- : Ensure that all local regulations regarding handling and storage facilities are followed.

Effective Date 2015-02-18

## Material Safety Data Sheet

According to the Controlled Product Regulations

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

#### Occupational Exposure Limits

Material	Source	Type	ppm	mg/m <sup>3</sup>	Notation
Hydrogen Sulphide	ACGIH	TWA	1 ppm		
	ACGIH	STEL	5 ppm		

Consult local authorities for acceptable exposure limits within their jurisdiction.

#### Biological Exposure Index (BEI) - See reference for full details

No biological limit allocated.

- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Use sealed systems as far as possible. Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended. Eye washes and showers for emergency use.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. All respiratory protection equipment and use must be in accordance with local regulations.
- Hand Protection** : Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended. Suitability and durability of a glove is dependent on usage, e.g. frequency and

## Material Safety Data Sheet

According to the Controlled Product Regulations

Eye Protection	: Chemical splash goggles (chemical monogoggles).
Protective Clothing	: Chemical resistant gloves/gauntlets, boots, and apron (where risk of splashing).
Monitoring Methods	: Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Environmental Exposure Controls	: Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Dark brown. Viscous liquid.
Odour	: Hydrocarbon.
Odour threshold	: Data not available
pH	: Data not available
Initial Boiling Point and Boiling Range	: 127 - 550 °C / 261 - 1,022 °F
Freezing Point	: Data not available
Vapour pressure	: 0.2 - 7.91 hPa at 120 °C / 248 °F
Specific gravity	: Data not available
Density	: 0.981 - 1.028 g/cm³ at 15.00 °C / 59.00 °F
Water solubility	: Negligible.
n-octanol/water partition coefficient (log Pow)	: Data not available
Kinematic viscosity	: 6.1 mm²/s at 120 °C / 248 °F
Vapour density (air=1)	: Data not available
Evaporation rate (nBuAc=1)	: Data not available

### 10. STABILITY AND REACTIVITY

Stability	: Stable under normal conditions of use.
Conditions to Avoid	: Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid	: Strong oxidising agents.
Hazardous Decomposition Products	: Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or

## Material Safety Data Sheet

According to the Controlled Product Regulations

<b>Hazardous Polymerisation</b>	: No
<b>Sensitivity to Mechanical Impact</b>	: No
<b>Sensitivity to Static Discharge</b>	: Yes

### 11. TOXICOLOGICAL INFORMATION

<b>Basis for Assessment</b>	: Information given is based on product data, a knowledge of the components and the toxicology of similar products.
<b>Acute Oral Toxicity</b>	: Low toxicity: LD50 >2000 mg/kg , Rat.
<b>Acute Dermal Toxicity</b>	: Low toxicity: LD50 >2000 mg/kg , Rabbit.
<b>Acute Inhalation Toxicity</b>	: Moderately toxic: LC50 >2 - 20 mg/l , 4 h , Rat.
<b>Skin Irritation</b>	: Expected to be slightly irritating. Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis. Contact with hot material can cause thermal burns which may result in permanent skin damage.
<b>Eye Irritation</b>	: Expected to be slightly irritating. Hot product may cause severe eye burns and/or blindness.
<b>Respiratory Irritation</b>	: Inhalation of vapours or mists may cause irritation to the respiratory system.
<b>Sensitisation</b>	: Not expected to be a sensitisier.
<b>Repeated Dose Toxicity</b>	: May cause damage to organs or organ systems through prolonged or repeated exposure. Blood. Liver. Thymus.
<b>Mutagenicity</b>	: Positive in in-vitro, but negative in in-vivo mutagenicity assays.
<b>Carcinogenicity</b>	: Causes cancer in laboratory animals.
<b>Reproductive and Developmental Toxicity</b>	: Causes foetotoxicity at doses which are maternally toxic.

### 12. ECOLOGICAL INFORMATION

Fuels are typically made from blending several refinery streams. Ecotoxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

<b>Acute Toxicity</b>	: Expected to be very toxic:LL/EL/IL50 < 1 mg/l(to aquatic organisms)(LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).
<b>Fish</b>	: Harmful: LL/EL/IL50 10-100 mg/l
<b>Aquatic Invertebrates</b>	: Toxic: LL/EL/IL50 1-10 mg/l
<b>Algae</b>	: Very toxic: LL/EL/IL50 < 1 mg/l
<b>Microorganisms</b>	: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
<b>Chronic Toxicity</b>	
<b>Fish</b>	: NOEC/NOEL > 0.01 - <=0.1 mg/l
<b>Aquatic Invertebrates</b>	: NOEC/NOEL > 0.1 - <=1.0 mg/l
<b>Mobility</b>	: Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. Large volumes may

## Material Safety Data Sheet

According to the Controlled Product Regulations

penetrate soil and could contaminate groundwater. Sinks in fresh water, but will float on sea water and form a slick. Contains volatile constituents.

**Persistence/degradability** : The volatile constituents will oxidize rapidly by photochemical reactions in air. Major constituents are inherently biodegradable.

**Bioaccumulation** : Contains constituents with the potential to bioaccumulate.

**Other Adverse Effects** : Films formed on water may affect oxygen transfer and damage organisms.

## 13. DISPOSAL CONSIDERATIONS

**Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

**Container Disposal** : Send to drum recoverer or metal reclaimer. Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums. Do not pollute the soil, water or environment with the waste container. Comply with any local recovery or waste disposal regulations.

**Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

## 14. TRANSPORT INFORMATION

### Canadian Road and Rail Shipping Classification

UN/NA Number UN 3082  
Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Technical name Distillates (petroleum), petroleum residues vacuum

Class Division 9

Packing group III

Shipping Description ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Distillates (petroleum), petroleum residues vacuum), Class 9, UN 3082, PG III

Additional Information MARPOL Annex 1 rules apply for bulk shipments by sea.

Middle Distillate  
Version 1.1

Effective Date 2015-02-18

According to the Controlled Product Regulations

## Material Safety Data Sheet

Transport classifications shown will be implemented for all transports by 1 July 2011.

### 15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Class/Description :** Class B3 Combustible Liquid  
Class D2A Other Toxic Effects - Carcinogen  
Class D2A Other Toxic Effects - Embryotoxic/Fetotoxic  
Class D2B Other Toxic Effects - Blood, Thymus, Liver.

#### Inventory Status

**DSL** : All components listed.  
**TSCA** : All components listed.

### 16. OTHER INFORMATION

**Additional Information** : This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.

**MSDS Version Number** : 1.1

**MSDS Effective Date** : 2015-02-18

**MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.

**MSDS Regulation** : The content and format of this (M)SDS is in accordance with the Controlled Product Regulations.

**MSDS Prepared By** : Shell Product Stewardship; 1-800-661-1600  
**Uses and Restrictions** : This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

**MSDS Distribution** : The information in this document should be made available to all who may handle the product.

#### Disclaimer

: The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

**Middle Distillate  
Version 1.1**

**Effective Date 2015-02-18**

**Material Safety Data Sheet**

**According to the Controlled Product Regulations**

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11/11

Print Date 2015-02-18

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