SNYDER E 1A

FRACTURING FLUID
Hydraulic Fracturing Fluid Product Component Information Disclosure

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Supplier</th>
<th>Purpose</th>
<th>Ingredients</th>
<th>Chemical Abstract Service Number (CAS #)</th>
<th>Maximum Ingredient Concentration in Additive (% by mass)**</th>
<th>Maximum Ingredient Concentration in HF Fluid (% by mass)**</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>GelLP-10</td>
<td>CST Performance Products Corp.</td>
<td>Gelling Agent</td>
<td>Phosphoric Acid</td>
<td>7664-38-2</td>
<td>5.00%</td>
<td>0.032314%</td>
<td></td>
</tr>
<tr>
<td>GelLP-10</td>
<td>CST Performance Products Corp.</td>
<td>Gelling Agent</td>
<td>Mixed Alkyl Phosphate Ester</td>
<td>Trade Secret</td>
<td>95.00%</td>
<td>0.61%</td>
<td></td>
</tr>
<tr>
<td>Activator XL-46D</td>
<td>CST Performance Products Corp.</td>
<td>Activator</td>
<td>Ferric Sulfate</td>
<td>10028-22-5</td>
<td>40.00%</td>
<td>0.364272%</td>
<td></td>
</tr>
<tr>
<td>Activator XL-46D</td>
<td>CST Performance Products Corp.</td>
<td>Activator</td>
<td>Isopropanolamine</td>
<td>78-96-6</td>
<td>15.00%</td>
<td>0.14%</td>
<td></td>
</tr>
<tr>
<td>Activator XL-46D</td>
<td>CST Performance Products Corp.</td>
<td>Activator</td>
<td>Ammonium Citrate</td>
<td>3012-65-5</td>
<td>15.00%</td>
<td>0.136602%</td>
<td></td>
</tr>
<tr>
<td>Activator XL-46D</td>
<td>CST Performance Products Corp.</td>
<td>Activator</td>
<td>Ferric Ammonium Citrate</td>
<td>1185-57-5</td>
<td>5.00%</td>
<td>0.05%</td>
<td></td>
</tr>
<tr>
<td>BrkLP-10</td>
<td>Clearwater Specialty Chemical</td>
<td>Breaker</td>
<td>Magnesium Oxide</td>
<td>1309-48-4</td>
<td>60.00%</td>
<td>0.438693%</td>
<td></td>
</tr>
<tr>
<td>BrkLP-10</td>
<td>Clearwater Specialty Chemical</td>
<td>Breaker</td>
<td>Petroleum distillates, straight-run middle</td>
<td>64741-44-2</td>
<td>100.00%</td>
<td>0.73%</td>
<td></td>
</tr>
<tr>
<td>Ottawa Sand 30/50</td>
<td>Unimin Corporation</td>
<td>Proppant</td>
<td>Crystalline Silica in the form of Quartz</td>
<td>14808-60-7</td>
<td>99.90%</td>
<td>24.925892%</td>
<td></td>
</tr>
<tr>
<td>Propane</td>
<td>BBOG</td>
<td>Carrier Fluid</td>
<td>Propane</td>
<td>74-98-6</td>
<td>99.00%</td>
<td>72.033424%</td>
<td></td>
</tr>
</tbody>
</table>

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier’s Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration’s (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Unit Description Used for Chemical Storage</th>
<th>Number of Units</th>
<th>Item Number for Unit on Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>GELLP-10</td>
<td>Chemical Addition</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>ACTXL-46</td>
<td>Chemical Addition</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>BRKLP-10</td>
<td>Chemical Addition</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Ottawa Sand 30/50 Mesh</td>
<td>LPG Sand Addition Unit</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Liquid Nitrogen</td>
<td>Flameless Nitrogen Pump</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Liquid Nitrogen</td>
<td>Nitrogen Vessel</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>N2 Compressed Gas</td>
<td>Nitrogen Tube Trailer</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Propane</td>
<td>LPG Storage Tank</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Diesel Fuel</td>
<td>All units (DOT Tanks on Units)</td>
<td>17</td>
<td>2, 3, 4, 7, 8, 9, 10, 12, 13, 15, 16, 17</td>
</tr>
<tr>
<td>Densometer</td>
<td>Manifold Trailer</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Densometer</td>
<td>Iron Trailer</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Start Volume Per Pump Day</td>
<td>Unit of Measure</td>
<td>Volume Per Day to be Pumped</td>
<td>Number of Pump Days</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>760</td>
<td>gal</td>
<td>690</td>
<td>5</td>
</tr>
<tr>
<td>760</td>
<td>gal</td>
<td>690</td>
<td>5</td>
</tr>
<tr>
<td>760</td>
<td>gal</td>
<td>690</td>
<td>5</td>
</tr>
<tr>
<td>220,000</td>
<td>lbs</td>
<td>220,000</td>
<td>5</td>
</tr>
<tr>
<td>247,200</td>
<td>scf</td>
<td>included in N2 Compressed Gas</td>
<td></td>
</tr>
<tr>
<td>776,400</td>
<td>scf</td>
<td>included in N2 Compressed Gas</td>
<td></td>
</tr>
<tr>
<td>211,880</td>
<td>scf</td>
<td>640,000</td>
<td>5</td>
</tr>
<tr>
<td>163,120</td>
<td>gal</td>
<td>128,500</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Material Safety Data Sheet 15/10/2013 - version 2

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade name: GEL LP-10
Trade code: F014092
Chemical description: Product based on mixed alkyl phosphate ester.
Company:
GASFRAC Energy Services Inc. - 1900, 801 - 6 Ave. SW –
Calgary, AB T2P 3W2 – CANADA
Tel: (403) 237-6077 - Fax: (403) 269-3722
Emergency telephone number of the company and/or of an authorised advisory centre:
Phone n. 403-237-6077
The emergency contact shold only be used in the event of chemical emergencies involving a spill, leak, fire exposure or accidental involving chemicals.

EMERGENCY OVERVIEW

WARNING:
Causes skin and eye burns.
Combustible liquid and vapour.
Prolonged or excessive inhalation may cause respiratory tract irritation.
Appearance: Liquid, water white.
Odour: Slight.

HMIS INFORMATION

HAZARD INDEX:
4 = SEVERE
3 = SERIOUS
2 = MODERATE
1 = SLIGHT
0 = MINIMAL
C* Safety glasses, gloves, chemical apron.

2. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredients:

<table>
<thead>
<tr>
<th>n</th>
<th>NAME</th>
<th>CAS</th>
<th>%WEIGHT</th>
<th>OSHA.PEL mg/m3</th>
<th>OSHA.STEAL mg/m3</th>
<th>TLV-STELE mg/m3</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Mixed alkyl phosphate ester</td>
<td>-</td>
<td>70-95%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>Phosphoric acid</td>
<td>7664-38-2</td>
<td>1-5%</td>
<td>-</td>
<td>-</td>
<td>3*</td>
<td>-</td>
</tr>
</tbody>
</table>

*: American Conference of Governmental Industrial Hygienists (ACGIH).

3. HAZARDS IDENTIFICATION

GENERAL PHRASES

WARNING:
Causes skin and eye burns.
Combustible liquid and vapour.
Prolonged or excessive inhalation may cause respiratory tract irritation.
CARCINOGENIC
Not Carcinogenic IARC\NTP\OSHA

4. FIRST AID MEASURES

Contact with skin:
Immediately take off all contaminated clothing.
Areas of the body that have - or are only even suspected of having - come into contact with the product must be rinsed immediately with plenty of running water and possibly with soap.
OBTAIN IMMEDIATE MEDICAL ATTENTION.

Contact with eyes:
Wash immediately and thoroughly with running water, keeping eyelids raised, for at least 10 minutes. Following this, protect the eyes with sterile gauze or a clean, dry, handkerchief. GET MEDICAL ATTENTION.

Do not use eyewash or ointment of any kind (before obtaining an examination or advice from an eye specialist).

**Swallowing:**
Do not under any circumstances induce vomiting. GET MEDICAL ATTENTION IMMEDIATELY.

**Inhalation:**
Ventilate the premises. The patient is to be removed immediately from the contaminated premises to rest in a well ventilated area. GET MEDICAL ATTENTION.

---

### 5. FIRE-FIGHTING MEASURES

**Flash Point:** 151 °F (66 °C)  
**Method:** closed cup

**Osha Flammability:** Combustible liquid

**Lower flammable limit** nil %  
**Upper flammable limit** nil %

**Autoignition temperature** nil F (nil C)

**Recommended extinguishers:**
- Water, CO2, Foam, Chemical powders, according to the materials involved in the fire.

**Extinguishers not to be used:**
- None in particular.

**Risks arising from combustion:**
- Avoid inhaling the fumes.

**Protective equipment:**
- Use protection for the respiratory tract.
- Cool the containers exposed to the fire with water.

---

### 6. ACCIDENTAL RELEASE MEASURES

**Measures for personal safety:**
Use a mask, gloves and protective clothing.

**Environmental measures:**
- Limit leakages with earth or sand.
- If the product has escaped into a water course, into the drainage system, or has contaminated the ground or vegetation, notify the competent authorities.

**Cleaning methods:**
- Rapidly recover the product. To do so, wear a mask and protective clothing.
- If the product is in a liquid form, stop it from entering the drainage system.
- Recover the product for re-use if possible, or for elimination. The product might, where appropriate, be absorbed by inert material.

---

### 7. HANDLING AND STORAGE

**Handling precautions:**
- Avoid contact and inhalation of the vapours/spray/dusts. See, too, paragraph 8 below.
- Do not eat or drink while working.
- Do not smoke while working.

**Incompatible materials:**
- Not known.

**Storage conditions:**
- Adequate ventilation in working area.
- Always keep the containers tightly closed.
- Keep away from heat, sparks, and flame.
- Keep away from unguarded flame, sparks, and heat sources. Avoid direct exposure to sunlight.

**Instructions as regards storage premises:**
- Adequately ventilated premises.

**Packaging suggested:**
### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Precautionary measures:</th>
<th>Give adequate ventilation to the premises where the product is stored and/or handled.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory protection:</td>
<td>Use respiratory protection where ventilation is insufficient or exposure is prolonged.</td>
</tr>
<tr>
<td>Protection for hands:</td>
<td>Use protective gloves that provides comprehensive protection.</td>
</tr>
<tr>
<td>Eye protection:</td>
<td>Use close fitting safety goggles and/or visor conforming.</td>
</tr>
<tr>
<td>Protection for skin:</td>
<td>Use clothing that provides comprehensive protection to the skin.</td>
</tr>
</tbody>
</table>

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid, water white.</td>
</tr>
<tr>
<td>Odour</td>
<td>Alcohol</td>
</tr>
<tr>
<td>pH</td>
<td>&lt; 2.5</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Dispersible</td>
</tr>
<tr>
<td>Specific Gravity (water=1)</td>
<td>0.99 at 68 °F/ 20°C.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Data not available.</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

| Conditions to avoid       | Stable under normal conditions.   |
| Substances to avoid       | Strong oxidising agents and alkalis. Avoid contact with combustible materials. The product could catch fire. |
| Hazardous decomposition products: | Stable under normal conditions. |

### 11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin contact</td>
<td>Causes skin burns.</td>
</tr>
<tr>
<td>Eye contact</td>
<td>Causes eye burns.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Prolonged or excessive inhalation may cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Acute oral toxicity on rats (LD50):</td>
<td>Data not available.</td>
</tr>
</tbody>
</table>

### 12. ECOLOGICAL INFORMATION

Adopt good working practices, so that the product is not released into the environment.

### 13. DISPOSAL CONSIDERATIONS

Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure compete and accurate classification.

### 14. TRANSPORT INFORMATION

| US DOT               | UN 3265 Corrosive liquid,acidic, organic n.o.s (Alkyl phosphate ester, Phosphoric acid), 8, PG III |

Plastic totes.
Incompatible materials:
Aluminium and alloys of copper.
MATERIAL SAFETY DATA SHEET
GEL LP-10

ADR/RID: UN 3265 Corrosive liquid, acidic, organic n.o.s (Alkyl phosphate ester, Phosphoric acid), 8, PG III

IMDG CODE: UN 3265 Corrosive liquid, acidic, organic n.o.s (Alkyl phosphate ester, Phosphoric acid), 8, PG III

IATA/ICAO: UN 3265 Corrosive liquid, acidic, organic n.o.s (Alkyl phosphate ester, Phosphoric acid), 8, PG III

15. REGULATORY INFORMATION

<table>
<thead>
<tr>
<th>n</th>
<th>Name</th>
<th>CAS</th>
<th>TSCA</th>
<th>CERCLA</th>
<th>Sara302</th>
<th>Sara313</th>
<th>SARA Title III Section 311/312</th>
<th>State Regulations:</th>
<th>California Proposition 65:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Mixed alkyl phosphate ester.</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Immediate (acute) health effects. - Fire hazard.</td>
<td>Canadian Regulations: All the ingredients as such or as chemical group are registered in DSL.</td>
<td>Not cited (all components).</td>
</tr>
<tr>
<td>0</td>
<td>Phosphoric acid</td>
<td>7664-38-2</td>
<td>Yes</td>
<td>5,000</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SARA Title III Section 311/312: Immediate (acute) health effects. - Fire hazard.
State Regulations: Canadian Regulations: All the ingredients as such or as chemical group are registered in DSL. Canadian WHMIS Classification: D2B - E: Corrosive liquid - B3 (Combustible Liquid.). California Proposition 65: Not cited (all components).

16. OTHER INFORMATION

Main bibliographic sources:
- ESIS - European chemical Substances Information System - ECB European Chemical Bureau
- SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eighth Edition - Van Nostrand Reinold
- ACGIH - TLVs and BEIs - 2012 edition

The product must be stored, handled and used according to criteria of good industrial practice and to regulations in force. This leaflet is offered for your consideration and guidance only. This leaflet complements the Technical Data Sheet but does not replace it.

The information herein contained is given to the best of our knowledge at the time of issue. Due to the several ways in which the product may be used and the possible interaction with variables not depending on or unknown to the supplier, we also cannot accept any liability whatsoever for any loss or damage however arising from the handling and use of our products.
Material Safety Data Sheet 15/10/2013 - version 2

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
   Trade name: ACTIVATOR XL-46D
   Trade code: F014153
   Chemical description: Product based on ferric sulfate.
   Company:
   GASFRAC Energy Services Inc. - 1900, 801 - 6 Ave. SW. –
   Calgary, AB T2P 3W2 – CANADA
   Tel: (403) 237-6077 - Fax: (403) 269-3722
   Emergency telephone number of the company and/or of an authorised advisory centre:
   Phone n. 403-237-6077
   The emergency contact should only be used in the event of chemical emergencies involving a
   spill, leak, fire exposure or accidental involving chemicals.

EMERGENCY OVERVIEW
   WARNING:
   Causes skin and eye burns.
   Harmful if swallowed.
   Prolonged or excessive inhalation may cause respiratory tract irritation.
   Appearance: Liquid, dark.
   Odour: Amine.

HMIS INFORMATION
HAZARD INDEX: 4 = SEVERE
HEALTH 3 = SERIOUS
FLAMMABILITY 1 = MODERATE
REACTIVITY 1 = SLIGHT
PERSONAL PROT. C = MINIMAL
   C* Safety glasses, gloves, chemical apron.

2. COMPOSITION, INFORMATION ON INGREDIENTS
   Ingredients:
   n NAME CAS %WEIGHT OSHA.PEL mg/m3 OSHA.STEAL mg/m3 OTHER mg/m3 NOTE
   0 Ferric Sulfate. 10028-22-5 30-40% - - - -
   1 Ammonium Citrate. 3012-65-5 5-15% - - - -
   2 Isopropanolamine. 78-96-6 5-15% - - - -
   3 Ferric Ammonium 1185-57-5 1-5% - - - -
      Citrate.
   4 Non-hazardous up to100% - - - -
      components.

3. HAZARDS IDENTIFICATION
   GENERAL PHRASES
   WARNING:
   Causes skin and eye burns.
   Harmful if swallowed.
   Prolonged or excessive inhalation may cause respiratory tract irritation.
   CARCINOGENIC
   Not Carcinogenic IARC\NTP\OSHA

4. FIRST AID MEASURES
   Contact with skin:
   Immediately take off all contaminated clothing.
Areas of the body that have - or are only even suspected of having - come into contact with the product must be rinsed immediately with plenty of running water and possibly with soap. OBTAIN IMMEDIATE MEDICAL ATTENTION.

Contact with eyes:
- Wash immediately and thoroughly with running water, keeping eyelids raised, for at least 10 minutes. Following this, protect the eyes with sterile gauze or a clean, dry, handkerchief.
- GET MEDICAL ATTENTION.
- Do not use eyewash or ointment of any kind (before obtaining an examination or advice from an eye specialist).

Swallowing:
- In the event of accidental ingestion and only if the patient is conscious, rinse mouth with plenty of water without swallowing.
- Do not under any circumstances induce vomiting. GET MEDICAL ATTENTION IMMEDIATELY.

Inhalation:
- Ventilate the premises. The patient is to be removed immediately from the contaminated premises to rest in a well ventilated area. GET MEDICAL ATTENTION.

### 5. FIRE-FIGHTING MEASURES

- **Flash Point:** > 200 °F > 93 °C. Method: closed cup
- **Osha Flammability:** None.
- **Lower flammable limit:** nil %
- **Upper flammable limit:** nil %
- **Autoignition temperature:** nil F (nil C)

**Recommended extinguishers:**
- Water, CO2, Foam, Chemical powders, according to the materials involved in the fire.

**Extinguishers not to be used:**
- None in particular.

**Risks arising from combustion:**
- Avoid inhaling the fumes.
- Protective equipment:
  - Use protection for the respiratory tract.
  - Cool the containers exposed to the fire with water.

### 6. ACCIDENTAL RELEASE MEASURES

**Measures for personal safety:**
- Use a mask, gloves and protective clothing.

**Environmental measures:**
- Limit leakages with earth or sand.
- If the product has escaped into a water course, into the drainage system, or has contaminated the ground or vegetation, notify the competent authorities.

**Cleaning methods:**
- Rapidly recover the product. To do so, wear a mask and protective clothing.
- If the product is in a liquid form, stop it from entering the drainage system.
- Recover the product for re-use if possible, or for elimination. The product might, where appropriate, be absorbed by inert material.

### 7. HANDLING AND STORAGE

**Handling precautions:**
- Avoid contact and inhalation of the vapours/spray/dusts. See, too, paragraph 8 below.
- Do not eat or drink while working.
- Do not smoke while working.

**Incompatible materials:**
- Not known.

**Storage conditions:**
Adequate ventilation in working area.
Always keep the containers tightly closed.
Instructions as regards storage premises:
  Adequately ventilated premises.
Packaging suggested:
  Plastic totes.
Incompatible materials:
  Aluminium and alloys of copper.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION
Precautionary measures:
  Give adequate ventilation to the premises where the product is stored and/or handled.
Respiratory protection:
  Use respiratory protection where ventilation is insufficient or exposure is prolonged.
Protection for hands:
  Use protective gloves that provides comprehensive protection.
Eye protection:
  Use close fitting safety goggles and/or visor conforming.
Protection for skin:
  Use clothing that provides comprehensive protection to the skin.

9. PHYSICAL AND CHEMICAL PROPERTIES
Appearance: Liquid, dark.
Odour: Amine.
\( \text{pH} \): < 2.5
Solubility in water: Soluble.
Specific Gravity (water=1): 1.395 at 68 °F/ 20°C.
Boiling Point Initial 212[°F] 100[°C]

10. STABILITY AND REACTIVITY
Conditions to avoid:
  Stable under normal conditions.
Substances to avoid:
  Strong oxidising agents, alkalis and bases.
Hazardous decomposition products:
  Stable under normal conditions.

11. TOXICOLOGICAL INFORMATION
Skin contact: Causes skin burns.
Eye contact: Causes eye burns.
Inhalation: Prolonged or excessive inhalation may cause respiratory tract irritation.
Ingestion: Harmful if swallowed.
Acute oral toxicity on rats (LD50): > 500 < 2000 mg/kg.*
Extraordinary: Based on components.

12. ECOLOGICAL INFORMATION
Adopt good working practices, so that the product is not released into the environment.

13. DISPOSAL CONSIDERATIONS
Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR
MATERIAL SAFETY DATA SHEET
ACTIVATOR XL-46D

Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

14. TRANSPORT INFORMATION

US DOT
UN 3264, Corrosive liquid, acidic, inorganic n.o.s (Ferric Sulfate), 8, PGII

ADR/RID:
UN 3264, Corrosive liquid, acidic, inorganic n.o.s (Ferric Sulfate)
Class: 8
Packing Group: II
IMDG CODE:
UN 3264, Corrosive liquid, acidic, inorganic n.o.s (Ferric Sulfate)
Class: 8
Packing Group: II
IATA/ICAO:
UN 3264, Corrosive liquid, acidic, inorganic n.o.s (Ferric Sulfate)
Class: 8
Packing Group: II

15. REGULATORY INFORMATION

<table>
<thead>
<tr>
<th>n</th>
<th>Name</th>
<th>CAS</th>
<th>TSCA</th>
<th>CERCLA</th>
<th>Sara302</th>
<th>Sara313</th>
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<tbody>
<tr>
<td>0</td>
<td>Ferric Sulfate.</td>
<td>10028-22-5</td>
<td>Yes</td>
<td>1,000</td>
<td>No</td>
<td>No</td>
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<tr>
<td>1</td>
<td>Ammonium Citrate.</td>
<td>3012-65-5</td>
<td>Yes</td>
<td>5,000</td>
<td>No</td>
<td>No</td>
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<tr>
<td>2</td>
<td>Isopropanolamine.</td>
<td>78-96-6</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<td>3</td>
<td>Ferric Ammonium Citrate.</td>
<td>1185-57-5</td>
<td>Yes</td>
<td>1,000</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Non-hazardous components.</td>
<td>-</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

SARA Title III Section 311/312: Immediate (acute) health effects.
State Regulations:
Canadian Regulations: All the ingredients as such or as chemical group are registered in DSL.
Canadian WHMIS Classification: D2B - E: Corrosive liquid.
California Proposition 65: Not cited (all components).

16. OTHER INFORMATION

Main bibliographic sources:
ESIS - European chemical Substances Information System - ECB European Chemical Bureau
SAX’s DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eighth Edition - Van Nostrand Reinold
ACGIH - TLVs and BEIs - 2012 edition

The product must be stored, handled and used according to criteria of good industrial practice and to regulations in force. This leaflet is offered for your consideration and guidance only. This leaflet complements the Technical Data Sheet but does not replace it. The information herein contained is given to the best of our knowledge at the time of issue. Due to the several ways in which the product may be used and the possible interaction with variables not depending on or unknown to the supplier, we also cannot accept any liability whatsoever for any loss or damage however arising from the handling and use of our products.
Material Safety Data Sheet

BRKLP-10

1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Material name</th>
<th>BRKLP-10</th>
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<tbody>
<tr>
<td>Patent Number</td>
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</tr>
<tr>
<td>Revision date</td>
<td>24-February-2011</td>
</tr>
<tr>
<td>Version No.</td>
<td>7</td>
</tr>
<tr>
<td>CAS #</td>
<td>Mixture</td>
</tr>
<tr>
<td>Product use</td>
<td>Gel Breaker</td>
</tr>
</tbody>
</table>
| Manufacturer information      | Clearwater® Specialty Chemical Co.  
4300 South Street  
Blackfalds, AB T0M 0J0 CA  
Product Safety 210-626-0850  
Chemtrec 800-424-9300/703-527-3887 |
| Emergency                     | Chemtrec 800-424-9300/703-527-3887 |
| Supplier information          | GasFrac Energy Services LP  
1900, 801 - 6 Ave. S.W.  
Calgary, T2P 3W2 CA |
| Supplier emergency telephone number(s) | CHEMTREC 800-424-9300/703-527-3887 |

2. HAZARDS IDENTIFICATION

Emergency Overview

CAUTION

Irritating to eyes. Contact with skin may cause irritation. May be harmful by inhalation. May be harmful if swallowed. Prolonged exposure may cause chronic effects. This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Potential health effects

Routes of exposure

Eye contact. Inhalation.

Eyes

May cause irritation, redness and pain. Avoid contact with eyes.

Skin

This material may be irritating to skin. Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash). Avoid contact with the skin.

Inhalation

May be harmful by inhalation. May cause irritation of respiratory tract. Excessive inhalation of this material causes headache, dizziness, nausea and incoordination. Do not breathe dust/fume/gas/mist/vapours/spray.

Ingestion

May be harmful if swallowed. May be irritating to mouth, throat, and stomach. Aspiration into lungs may occur during ingestion or vomiting, causing lung damage and chemical pneumonia. Do not ingest.

Potential environmental effects

Ecological injuries are not known or expected under normal use.
Chronic effects

Excessive exposures may affect human health, as follows: dizziness, tremors, headache, narcosis.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrolleum distillates, straight-run middle</td>
<td>64741-44-2</td>
<td>65 - 100</td>
</tr>
<tr>
<td>MAGNESIUM OXIDE</td>
<td>1309-48-4</td>
<td>30 - 60</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid procedures

- **Eye contact**
  Immediately flush eyes with plenty of water for at least 15 minutes. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Get medical attention if irritation develops or persists.

- **Skin contact**
  Wash off immediately with soap and plenty of water. Remove and isolate contaminated clothing and shoes. Get medical attention if irritation develops or persists.

- **Inhalation**
  Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.

- **Ingestion**
  Rinse mouth. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth to a victim who is unconscious or is having convulsions. Get medical attention immediately.

Notes to physician
Symptoms may be delayed.

General advice
If you feel unwell, seek medical advice (show the label where possible). Give oxygen or artificial respiration if needed. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

Fire fighting equipment/instructions
Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

Extinguishing media
- Suitable extinguishing media
  Dry chemical, CO2, water spray or regular foam.

Protection of firefighters
- Protective equipment and precautions for firefighters
  Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out.

Flammable properties
Not a fire hazard.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Local authorities should be advised if significant spillages cannot be contained. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep out of low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so.
**Methods for containment**
Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

**Methods for cleaning up**
Large Spills: Dike far ahead of liquid spill for later disposal. Soak up condensate with inert absorbent material and collect in ventilated waste container for disposal. After removal flush contaminated area thoroughly with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean contaminated surface thoroughly.

**Other information**
Never return spills in original containers for re-use. Clean up in accordance with all applicable regulations.

---

### 7. HANDLING AND STORAGE

**Handling**
Use only with adequate ventilation. Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get this material on clothing. Handle and open container with care. Wash thoroughly after handling.

**Storage**
Keep containers tightly closed in a cool, well-ventilated place. Store in a closed container away from incompatible materials. Use care in handling/storage. Store in accordance with local/regional/national/international regulation.

---

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure limits**
ACGIH

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
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<tbody>
<tr>
<td>MAGNESIUM OXIDE</td>
<td>1309-48-4</td>
<td>10 mg/m3</td>
<td>Not established</td>
<td>Not established</td>
</tr>
</tbody>
</table>

**Engineering controls**
Ensure adequate ventilation, especially in confined areas.

**Personal protective equipment**

- **Eye / face protection**
  Safety glasses with side-shields. Wear chemical goggles.

- **Skin protection**
  Protective gloves. Wear suitable protective clothing. Closed-toe shoes recommended.

- **Respiratory protection**
  When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. If exposure may or does exceed occupational exposure limits use a NIOSH-approved respirator to prevent overexposure.

- **General hygiene considerations**
  Avoid contact with eyes. Avoid contact with skin. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

---

### 9. PHYSICAL & CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Slurry</td>
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<tr>
<td><strong>Colour</strong></td>
<td>Grey</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>Oily</td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
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</tr>
<tr>
<td><strong>Physical state</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td><strong>Form</strong></td>
<td>Liquid</td>
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<tr>
<td><strong>pH</strong></td>
<td>Not available</td>
</tr>
<tr>
<td>Property</td>
<td>Value</td>
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<tr>
<td>------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not available</td>
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<tr>
<td>Boiling point</td>
<td>1439 °C (2622.2 °F) estimated</td>
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<tr>
<td>Flash point</td>
<td>&gt; 93.9 °C (&gt; 201 °F)</td>
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<tr>
<td>Evaporation rate</td>
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</tr>
<tr>
<td>Flammability</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability limits in air, upper, % by volume</td>
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</tr>
<tr>
<td>Vapour pressure</td>
<td>Not available</td>
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<td>Vapour density</td>
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<td>Relative density</td>
<td>9.33</td>
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<td>Partition coefficient</td>
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<td>(n-octanol/water)</td>
<td></td>
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<tr>
<td>Auto-ignition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
</tbody>
</table>

### 10. CHEMICAL STABILITY & REACTIVITY INFORMATION

**Chemical stability**
Stable at normal conditions.

**Conditions to avoid**
Avoid high temperatures.

**Incompatible materials**
Strong oxidizing agents. Acids.

**Hazardous decomposition products**
Oxides of carbon.

**Possibility of hazardous reactions**
Will not occur.

### 11. TOXICOLOGICAL INFORMATION

**Acute effects**
Acute LD50: 7905 mg/kg estimated, rat, Oral
Acute LD50: 3162 mg/kg estimated, rat, Dermal

**Sensitisation**
Not expected to be hazardous by WHMIS criteria.

**Local effects**
Irritating to eyes, respiratory system and skin.

**Chronic effects**
Not expected to be hazardous by WHMIS criteria. Chronic exposure may cause headache, confusion, tremors, memory loss, slurred speech and anorexia.

**Carcinogenicity**
Not expected to be hazardous by WHMIS criteria.

**ACGIH - Threshold Limit Values - Carcinogens**
MAGNESIUM OXIDE 1309-48-4 A4 - Not Classifiable as a Human Carcinogen

**Neurological effects**
Hazardous by OSHA criteria. Excessive exposure may cause central nervous system effects such as dizziness, drowsiness or headaches.

**Reproductive effects**
Not expected to be hazardous by WHMIS criteria.

### 12. ECOLOGICAL INFORMATION

**Ecotoxicity**
Ecological injuries are not known or expected under normal use.
Environmental Effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. DISPOSAL CONSIDERATIONS

Disposal instructions

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

Canadian Transportation of Dangerous Goods (TDG) Requirements

Not regulated as hazardous goods.

Canadian Transportation of Dangerous Goods (TDG) Requirements

Not regulated as dangerous goods.

Department of Transportation (DOT) Requirements

Not regulated as hazardous goods.

Department of Transportation (DOT) Requirements

Not regulated as hazardous goods.

IMDG

Not regulated as hazardous goods.

IMDG

Not regulated as dangerous goods.

IATA

Not regulated as hazardous goods.

IATA

Not regulated as dangerous goods.

15. REGULATORY INFORMATION

Canadian regulations

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR. All components of this product are on the Canadian DSL list.

WHMIS status

Controlled

WHMIS Classification

D2B - Other Toxic Effects-TOXIC

WHMIS labeling

International regulations

ACGIH - Threshold Limit Values - Carcinogens

MAGNESIUM OXIDE 1309-48-4 A4 - Not Classifiable as a Human Carcinogen
### Inventory status

<table>
<thead>
<tr>
<th>Country(s) or region</th>
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<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
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</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>yes</td>
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<tr>
<td>Europe</td>
<td>European Inventory of New and Existing Chemicals (EINECS)</td>
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<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>no</td>
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<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
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<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
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<td>New Zealand</td>
<td>New Zealand Inventory</td>
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<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
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<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>yes</td>
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</tbody>
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A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).

### 16. OTHER INFORMATION

#### HMIS® ratings

- **Health:** 2
- **Flammability:** 1
- **Physical Hazard:** 0
- **Personal Protection:** B

#### NFPA ratings

- **Health:** 2
- **Flammability:** 1
- **Instability:** 0

#### Prepared by

Product Stewardship  
515 Post Oak Blvd  
Houston, TX 77027  
+1-713-968-2306

#### Disclaimer

THIS PRODUCT'S HEALTH AND SAFETY INFORMATION IS PROVIDED TO ASSIST OUR CUSTOMERS IN ASSESSING COMPLIANCE WITH HEALTH, SAFETY AND ENVIRONMENTAL REGULATIONS. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US, AND IS BELIEVED TO BE ACCURATE, ALTHOUGH NO GUARANTEE OR WARRANTY IS PROVIDED OR IMPLIED BY THE COMPANY IN THIS RESPECT. SINCE THE USE OF THIS PRODUCT IS WITHIN THE EXCLUSIVE CONTROL OF THE USER, IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE CONDITIONS OF SAFE USE. SUCH CONDITIONS MUST COMPLY WITH ALL GOVERNMENTAL REGULATIONS.

#### Issue date

24-February-2011

#### Revised sections

MATERIAL SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

UNIMIN CORPORATION
258 Elm Street
New Canaan, CT 06840

Emergency Telephone Number
(203) 966-8880

Telephone Number for Information
(203) 966-8880

PRODUCT NAME: Crystalline Silica in the form of Quartz – various grades

SYNONYMS: Quartz, Crystalline Silica, Silicon Dioxide

Date Prepared: May 2009

SECTION 2: HAZARDS IDENTIFICATION

This product is a chemically inert, non-combustible mineral.

EMERGENCY OVERVIEW
WARNING!
Lung injury and cancer hazard. Do not breathe dust. May cause delayed lung injury. Long term exposure can cause silicosis. Silicosis is a respiratory disease, which can result in delayed, disabling and sometimes fatal lung injury. IARC and NTP have determined that crystalline silica inhaled from occupational sources can cause cancer in humans. Risk of injury is dependent on the duration and level of exposure. A single exposure will not result in serious adverse effects. See "Health Hazards" in Section 11 for detailed information. See exposure limit presentation in Section 8 for further information.

Avoid creating dust when handling, using or storing. Use only with adequate ventilation to keep exposure below recommended exposure limits.

EU Classification of Substance/Preparation: Harmful (Xn) R48/20

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS# / EINECS #</th>
<th>Component Description</th>
<th>Percentage</th>
<th>EU Classification (67/548/EEC)</th>
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</thead>
<tbody>
<tr>
<td>14808-60-7 / 238-878-4</td>
<td>Crystalline Silica in the form of Quartz</td>
<td>87 - 99.9%</td>
<td>Xn R48/20</td>
</tr>
</tbody>
</table>

Refer to section 16 for further information on EU Classification.

See Section 8 for occupational exposure limit information

SECTION 4: FIRST AID MEASURES

Gross Inhalation: Remove victim to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult have qualified personnel administer oxygen. Get prompt medical attention.

Skin Contact: No first aid should be needed since dermal contact with this product does not affect the skin. Wash exposed skin with soap and water before breaks and at the end of the shift.

Eye Contact: Flush the eyes immediately with large amounts of running water, lifting the upper and lower lids occasionally. If irritation persists or for imbedded foreign body, get immediate medical attention.

Ingestion: If large amounts are swallowed, get immediate medical attention.
SECTION 5: FIREFIGHTING MEASURES

Extinguishing Media: This product will not burn but is compatible with all extinguishing media. Use any media that is appropriate for the surrounding fire.

Special Fire Fighting Procedures: None required with respect to this product. Firefighters should always wear self-contained breathing apparatus for fires indoors or in confined areas.

Unusual Fire and Explosion Hazards: None.

Hazardous Combustion Products: None.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Wear appropriate protective equipment. If uncontaminated, collect using dustless method (HEPA vacuum or wet method) and place in appropriate container for use. If contaminated: a) use appropriate method for the nature of contamination, and b) consider possible toxic or fire hazards associated with the contaminating substances. Collect for appropriate disposal.

SECTION 7: HANDLING AND STORAGE

Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Silica may be in the air without a visible dust cloud. Use normal precautions against bag breakage or spills of bulk material. Avoid creation of respirable dust. Do not use as a dry abrasive blasting agent. ANSI/AIHA Z9.4:1997 recommends that silica sand be prohibited as an abrasive blasting agent for use in fixed location abrasive-blast enclosures. Use good housekeeping in storage and use areas to prevent accumulation of dust in work area.

To reduce the risk of developing silicosis, lung cancer and other adverse health effects, the ACGIH recommends that the industrial hygienist use every means available to keep exposures below the recommended TLV. NIOSH recommends reducing airborne exposure levels as low as possible below NIOSH's recommended exposure limit, substituting less hazardous materials when feasible, using appropriate respiratory protection when source controls cannot keep exposures below the recommended limit and making medical examinations available to exposed workers.

Use adequate ventilation and dust collection. To minimize exposure, wear a respirator approved for silica dust when using, handling, storing or disposing of this product or bag. Refer to the most recent standards of ANSI (Z88.2), OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic. Maintain, clean and fit test respirators in accordance with OSHA regulations. Maintain and test ventilation and dust collection equipment. Launder clothing that has become dusty. Empty containers (bags, bulk containers, storage tanks, etc.) retain silica residue and must be handled in accordance with the provisions of this Material Safety Data Sheet. WARN and TRAIN employees in accordance with state and federal regulations.

WARN YOUR EMPLOYEES (AND YOUR CUSTOMERS AND USERS IN CASE OF RESALE) BY POSTING, AND OTHER MEANS, OF THE HAZARDS AND OSHA AND ANY OTHER APPLICABLE REGULATORY PRECAUTIONS TO BE USED. PROVIDE TRAINING FOR YOUR EMPLOYEES ABOUT OSHA PRECAUTIONS.


Additional information on silica hazards and precautionary measures can be found at the following websites:

NIOSH Joint Campaign on Silicosis Prevention [http://www.cdc.gov/niosh/topics/silica/#campaign](http://www.cdc.gov/niosh/topics/silica/#campaign)
SECTION 8: EXPOSURE CONTROLS/PERS...
Ventilation: Use local exhaust as required to maintain exposures as far as possible below applicable occupational exposure limits. See also ACGIH "Industrial Ventilation - A Manual for Recommended Practice" (current edition). Control of exposure to dust must be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general or local exhaust ventilation and substitution of less toxic materials).

Respiratory Protection: When effective engineering controls are not feasible, or while they are being implemented, appropriate respiratory protection must be used. Use appropriate respiratory protection for respirable particulates based on consideration of airborne workplace concentrations and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (Z88.2), OSHA (29 CFR 1910.134), MSHA (30 CFR Parts 56 and 57) and NIOSH Respirator Decision Logic.

Gloves: Protective gloves recommended.

Eye Protection: Safety glasses or goggles recommended.

Other Protective Equipment/Clothing: As appropriate for the work environment. Dusty clothing should be laundered before reuse.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: White powder, odorless.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>4046°F / 2230°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>2930°F / 1610°C</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Negligible</td>
</tr>
<tr>
<td>Percent Volatile</td>
<td>0%</td>
</tr>
<tr>
<td>Autoignition Temp</td>
<td>Will not burn</td>
</tr>
<tr>
<td>Specific Gravity (water=1)</td>
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</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash Point (Method Used)</td>
<td>Fully oxidized, will not burn</td>
</tr>
<tr>
<td>Flammable Limits</td>
<td>LEL: Not applicable</td>
</tr>
<tr>
<td></td>
<td>UEL: Not applicable</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: None

Incompatibility: Powerful oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, etc.

Hazardous Decomposition Products: Silica will dissolve in hydrofluoric acid producing a corrosive gas, silicon tetrafluoride.

Hazardous Polymerization: Will not occur,

Conditions to Avoid: None

SECTION 11: TOXICOLOGICAL INFORMATION

HEALTH HAZARDS:

Inhalation: Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects:

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling and sometimes fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop mycobacterial infections (tuberculous and non-tuberculous) and fungal infections. Inhalation of air with a very high concentration of respirable silica dust can cause the most serious forms of silicosis in a matter of
months or a few years. Some epidemiologic studies have concluded that there is significant risk of developing silicosis even at airborne exposure levels that are equal to the recommended NIOSH REL, the ACGIH TLV, the OSHA PEL, and the MSHA Exposure Limit.

Cancer Status: The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program classifies respirable crystalline silica as "known to be a human carcinogen". Refer to the Eleventh Report on Carcinogens (2005). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

Other Data with Possible Relevance to Human Health:

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) rheumatoid arthritis, systemic lupus, erythematosus, sarcoidosis, chronic bronchitis, chronic obstructive pulmonary disease (COPD), emphysema, chronic kidney disease and end-stage renal disease.

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768, 1997, and see also NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica, April 2002 (see Section 7 for NIOSH Hazard Review Website).

Skin Contact: No adverse effects expected.

Eye Contact: Contact may cause mechanical irritation and possible injury.

Ingestion: No adverse effects expected for normal, incidental ingestion.

Chronic Health Effects: See "Inhalation" subsection above with respect to silicosis, cancer status and other data with possible relevance to human health.

Medical Conditions Aggravated by Exposure: Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to respirable quartz dust.

Signs and Symptoms of Exposure: Exposure to dust may cause mucous membrane and respiratory irritation, cough, sore throat, nasal congestion, sneezing and shortness of breath. However, there may be no immediate signs or symptoms of exposure to hazardous concentrations of respirable crystalline silica (quartz). See "Inhalation" subsection above for symptoms of silicosis. The absence of symptoms is not necessarily indicative of safe conditions.

Acute Toxicity Values: Silica: LD50 oral rat >22,500 mg/kg.

SECTION 12: ECOLOGICAL INFORMATION

Silica: LC50 carp >10,000 mg/L/72 hr. This product is not expected to present an environmental hazard.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Silica is not classified as a hazardous waste under US EPA RCRA regulations. If uncontaminated, dispose as an inert, non-metallic mineral. If contaminated, dispose in accordance with all applicable local, state/provincial and federal regulations in light of the contamination present. Local regulations may be more stringent than regional and
national requirements. It is the responsibility of the waste generator to determine the toxicity and physical characteristics of
the material to determine the proper waste identification and disposal in compliance with applicable regulations.

SECTION 14: TRANSPORT INFORMATION

U.S. DOT HAZARD CLASSIFICATION
Proper Shipping Name: Not Regulated
Technical Name: N/A
UN Number: N/A
Hazard Class/Packing Group: N/A
Labels Required: None
DOT Packaging Requirements: N/A
Exceptions: N/A

SECTION 15: REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

SARA 313 This Product Contains the Following Chemicals Subject to Annual Release Reporting Requirements Under the
SARA Section 313 (40 CFR 372): None

CERCLA Section 103 Reportable Quantity: None

California Proposition 65: This product contains crystalline silica (respirable) which is known to the State of California to
cause cancer.

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or exempt from
premanufacture notification requirements.

European Inventory of Commercial Chemical Substances: All of the components of this product are listed on the EINECS
Inventory or exempt from notification requirements. (The EINECS number for Quartz: 238-878-4)

European Community Labeling: Harmful Xn
Contains crystalline silica, quartz (238-878-4)
R48/20 Harmful: Danger of serious damage to health by prolonged exposure by inhalation.
S22 Do not breathe dust
S38 In case of insufficient ventilation, wear suitable respiratory equipment.

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances
List or exempt from notification requirements.

Canadian WHMIS Classification: Class D, Division 2, Subdivision A (Very Toxic Material causing other Toxic Effects)

This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS
contains all of the information required by the CPR.

Japan METI: All of the components of this product are existing chemical substances as defined in the Chemical Substance
Control Law.

Australian Inventory of Chemical Substances: All of the components of this product are listed on the AICS inventory or
exempt from notification requirements.

Australian National Occupational Health & Safety Commission Status: Hazardous according to the criteria of Australian
National Occupational Health & Safety Commission -Harmful (Xn) R48/20 Harmful: Danger of serious damage to health by
prolonged exposure by inhalation.
Korea: All of the components of this product are listed on the ECL inventory or exempt from notification requirements.

Philippines: All of the components of this product are listed on the PICCS inventory or exempt from notification requirements.

16: OTHER INFORMATION

EU Classes and Risk Phrases for Reference (See Sections 2 and 3)
Xn Harmful
R48/20 Harmful: Danger of serious damage to health by prolonged exposure by inhalation.
S22 Do not breathe dust
S38 In case of insufficient ventilation, wear suitable respiratory equipment.

NFPA Hazard Rating:  
Health: 1 Fire: 0 Reactivity: 0

HMIS Hazard Rating:  
Health: * Fire: 0 Reactivity: 0
* Warning - Chronic health effect possible - inhalation of silica dust may cause lung injury/disease (silicosis). Take appropriate measures to avoid breathing dust. See Section 3.

References:
- Registry for Toxic Effects of Chemical Substances (RTECS), 2006
- Patty's Industrial Hygiene and Toxicology
- NIOSH Hazard Review – Health Effects of Occupational Exposure to Respirable Crystalline Silica, April 2002
- NTP Eleventh Report on Carcinogens, 2005
- Hazardous Substances Data Bank (HSDB), 2006
- Documentation of the TLV – Silica, Crystalline: α-Quartz and Cristobalite, American Conference of Governmental Industrial Hygienists, 2006

Revision Summary: Switched Sections 2 and 3. Updated websites in Section 7.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data the Unimin Corporation believes reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside the control of Unimin Corporation, no warranties, expressed or implied, are made and no liability is assumed in connection with any use of this information. Any use of these data and information must be determined by the user to be in accordance with federal, state and local laws and regulations.
MATERIAL SAFETY DATA SHEET
NITROGEN, REFRIGERATED LIQUID

1. PRODUCT AND COMPANY INFORMATION

Product: Liquid Nitrogen
Trade Name: Liquid Nitrogen
Chemical Name: Nitrogen
Common Name: Liquefied Nitrogen
Formula: N₂
Manufacturer's Name: Ferus Gas Industries Inc.
Manufacturer's Address: Suite 916-401-9 Avenue S.W.
Calgary, Alberta Canada T2P-3C5
Supplier's Name: Ferus Gas Industries Inc.
Supplier's Address: Suite 916-401-9 Avenue S.W.
Calgary Alberta Canada T2P-1G9

24 Hr Emergency Phone Numbers: Ferus Transportation 1-403-340-2990
Toll Free 1-877-923-3787
CANUTEC (collect) 1-613-996-6666

Production Identification Number: UN 1977
WHMIS Classification: A
TDG Classification: 2.2

2. COMPOSITION/INFORMATION ON INGREDIENTS

EXPOSURE LIMITS¹:

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>% VOLUME</th>
<th>8-HOUR OCCUPATIONAL EXPOSURE LIMIT¹</th>
<th>15-MINUTE or CEILING (c) OCCUPATIONAL EXPOSURE LIMIT²</th>
<th>LD(50) (Route-Species)</th>
<th>LC(50) (Route-Species)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>&gt;99%</td>
<td>Simple Asphyxiant</td>
<td>Simple Asphyxiant</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CAS: 7727-37-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Refer to individual state or provincial regulations, as applicable, for limits which may be more stringent than those listed here.
² As listed in the Occupational Health and Safety Act, Regulation and Code of Alberta under OHS Code Schedule 1 (Table 2 Occupational exposure limits for chemical substances).
3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER! Odourless, colourless, non-flammable gas. Simple Asphyxiant – This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Contents under pressure. Contact with product may cause frostbite or freezing burns to exposed tissues. Use and store below 52°C. Self-Contained Breathing Apparatus and appropriate protective clothing may be required by rescue workers.

4. FIRST AID MEASURES

GENERAL: Always remove victim(s) from the source of contamination. Take a copy of label and MSDS to physician or other health professional with victim(s).

EYES: Never introduce ointment or oil into the eyes without medical advice! In case of freezing or cryogenic "burns" caused by rapidly evaporating liquid, DO NOT WASH THE EYES WITH HOT OR EVEN TEPID WATER! Remove victim from the source of contamination. Open eyelids wide to allow liquid to evaporate. If pain is present, refer the victim to an ophthalmologist for treatment and follow up. If the victim cannot tolerate light, protect the eyes with a light bandages. Do not apply any pressure.

SKIN: For dermal contact or frostbite: Remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic “burn” has resulted in blistering of the dermal surface or deep tissue freezing.

INGESTION: A physician should see the patient promptly if the cryogenic “burn” has resulted in blistering of the dermal surface or deep freezing.

INHALATION: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF- CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious person should be moved to an uncontaminated area, and if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.
5. FIRE OR EXPLOSION HAZARDS

FLASH POINT (test method): Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS IN AIR: LOWER: Not applicable. UPPER: Not applicable.

CONDITIONS OF FLAMMABILITY: Nitrogen is non flammable product and will not burn. Heat of fire can build up pressure in cylinders and vessels causing them to rupture. No part of the container should be subjected to a temperature higher than 52°C. Liquid Nitrogen containers are equipped with pressure relief devices to avoid rupture.

EXTINGUISHING MEDIA: Nitrogen cannot catch fire therefore; use the appropriated media for the surrounding area. Nitrogen will expand within the container as it is heated and begin to vent gas through the venting device. Responders may cool the container with water ensuring not to spray directly into the venting devices or product as the water will freeze rapidly and compromise the operation of the venting devices.

SPECIAL FIRE FIGHTING PROCEDURES:
WARNING! Extremely cold liquid and gas under pressure
Evacuate all personnel from danger area. Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. Immediately spray containers with water from maximum distance until cool, taking care not to direct spray into vents on top of containers. Do not discharge sprays into liquid nitrogen; it will freeze water rapidly. Shut off flow if you can do so without risk. Self-contained breathing apparatus may be required by rescue workers.

HAZARDOUS COMBUSTION PRODUCTS: Not applicable.

EXPLOSION SENSITIVITY TO MECHANICAL IMPACT: Not applicable.

EXPLOSION SENSITIVITY TO STATIC DISCHARGE: Not applicable.
6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
WARNING! Extremely cold liquid and gas under pressure. Asphyxiating. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Liquid causes severe frostbite, a burn like injury. Shut off flow if you can do so without risk. Avoid contact with spilled liquid and allow it to evaporate. Ventilate area of leak or move container to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces ensuring at least 19.5% oxygen in the atmosphere, before allowing reentry.

7. HANDLING AND STORAGE

ELECTRICAL CLASSIFICATION: Non-hazardous.
This liquefied gas is non-corrosive and may be used with all common structural materials. Use only in well-ventilated areas. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder or vessels by any means to increase the discharge rate of product.

Stationary customer site vessels should be operated in accordance with the manufacturer’s and Ferus’s instructions. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operations problem with the vessel, contact the closest Ferus location immediately for assistance.

Liquid Nitrogen is delivered into stationary vacuum jacketed vessels at the customer’s location. Consult manufacturer’s instructions.

STORAGE PRECAUTIONS: Store and use with adequate ventilation. Do not store at temperatures exceeding 52°C. Do not store in a confined space or near sources of heat, ignition and direct sunlight. Also ensure containers are not in a heavily trafficked area or near an emergency exit. Cryogenic containers are equipped with a pressure relief device and a pressure controlling valve. Under normal condition, these containers will periodically vent product. Use adequate pressure relief devices in systems and piping to prevent pressure buildup; entrapped liquid can generate extremely high pressures when vaporized by warming.

HANDLING PRECAUTIONS: Never allow any unprotected part of your body to touch un-insulated pipes or vessels containing cryogenic fluids. Flesh will stick to the extremely cold metal and will tear when you try to pull free. Use the properly specific, rated, tested and certified equipment when handling or working near the product. Only use transfer lines designed and compatible for cryogenic use.
8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST – Use a local exhaust system, if necessary, to prevent oxygen deficiency. Oxygen levels should be maintained above 19.5%.
MECHANICAL (general) – General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.
SPECIAL – None.
OTHER – None.

EYE/FACE PROTECTION: CSA (standard Z94.3-99 or Z94.3-02) approved safety glasses and full face shields are required to be utilized at all times when working with and/or around this product.

SKIN PROTECTION: Protective gloves of any material appropriate for the job. Insulated gloves are recommended for cryogenic liquids as well as long sleeve shirts and trousers.

RESPIRATORY PROTECTION: Use air supplied respirators where local or general exhaust ventilation is inadequate. CSA (standard Z94.4-02) approved supplied air/self contained air respirators must be used in confined spaces, oxygen deficient atmospheres and rescue situations where oxygen levels are below 19.5%.

OTHER/GENERAL PROTECTION: Safety shoes.

9. PHYSICAL AND CHEMICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICAL STATE</td>
<td>Liquid</td>
<td></td>
</tr>
<tr>
<td>MOLECULAR WEIGHT</td>
<td>28.01</td>
<td>g/mol</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (Air = 1)(1.1013 bar and 21°C)</td>
<td>0.967</td>
<td>g/L</td>
</tr>
<tr>
<td>VAPOUR PRESSURE (at 20°C)</td>
<td>N/A</td>
<td>bar</td>
</tr>
<tr>
<td>LIQUID DENSITY (at 21.1°C)</td>
<td>808.607</td>
<td>kg/m³</td>
</tr>
<tr>
<td>VAPOR DENSITY (at 21.1°C)</td>
<td>1.153</td>
<td>kg/m³</td>
</tr>
<tr>
<td>EVAPORATION RATE (nBuAc=1)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>BOILING POINT</td>
<td>-195.86</td>
<td>ºC</td>
</tr>
<tr>
<td>FREEZING POINT</td>
<td>-209.95</td>
<td>ºC</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>COEFFICIENT WATER/OIL DISTRIBUTION(Gas @ 15°C)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SPECIFIC VOLUME (1.013 bar and 21 °C)</td>
<td>0.862</td>
<td>m³/kg</td>
</tr>
</tbody>
</table>
Safety Data Sheet
Nitrogen, Refrigerated Liquid
Document # SAFF-ALL-N2LMSDS-050627

ODOUR AND APPEARANCE: Liquid Nitrogen is a colorless, odorless cryogenic liquid.

ODOUR THRESHOLD: Not applicable. Odorless.

10. REACTIVITY AND STABILITY DATA

CHEMICAL STABILITY: Normally stable in gaseous state. With cryogenic liquid, when exposed to air, oxygen in the air may condense into the Liquid Nitrogen. Liquid Nitrogen contaminated with oxygen may present the same hazards as Liquid Oxygen and could react violently with organic materials, such as oil and grease.

INCOMPATIBLE MATERIALS: Titanium is the only element that will burn in Nitrogen. Lithium reacts slowly with Nitrogen at ambient temperatures. Also, use of Liquid Nitrogen in cryogenic grinding of fatty materials can lead to an explosion. If Liquid Nitrogen and magnesium powder are mixed a very violent reaction will occur when lit with a fuse, forming magnesium nitride.

CONDITIONS OF REACTIVITY TO AVOID: Non-reactive at low and ambient temperature. Contact with incompatible materials. Exposure of cryogenic containers to high temperatures or direct flame can cause the container to rupture or burst. Liquid spillage can cause embrittlement of Non-cryogenic metals.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

11. TOXICOLOGICAL INFORMATION

Nitrogen is a non-toxic, simple asphyxiant. Initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

ROUTES OF ENTRY: The most significant routes of over-exposure for this gas are by inhalation, and contact with the cryogenic liquid.

-INHALATION: Nitrogen being an asphyxiant, high concentrations of this gas can cause an oxygen-deficient environment. An individual breathing in this atmosphere may experience symptoms which include headaches, ringing in the ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur.

-SKIN CONTACT: Skin coming contact with the liquid can result in severe cryogenic burns or dermatitis (red, cracked irritated skin), depending upon concentration and duration of exposure. Contact with the undiluted liquid will cause frostbite, ulceration of the skin (which may be delayed in appearance for several hours), blistering and pain.

-INGESTION: None.

-EYE CONTACT: Contact of the liquid with the eyes can cause pain, redness, severe cryogenic burns and prolonged exposure could cause blindness.
EFFECTS OF ACUTE EXPOSURE TO PRODUCT: The main health hazard associated with the release of Nitrogen gas is the inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness and nausea. The skin of a victim of over-exposure may have a blue color. At high concentrations, unconsciousness or death may occur. Also, contact with cryogenic liquid or rapidly expanding gases may cause frostbite. Frostbite may cause the affected area to turn white or grayish-yellow.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT: Chronic exposure to oxygen deficient atmospheres (below 18% oxygen) may affect the heart and nervous system.

OTHER EFFECTS OF OVEREXPOSURE: Not available.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None known.

TERATOGENICITY: Nitrogen is not reported to cause teratogenic effects in humans.

CARCINOGENICITY: Nitrogen is not carcinogenic.

MUTAGENICITY: Nitrogen is not reported to cause mutagenic effects in humans.

REPRODUCTIVE TOXICITY: Not listed.

IRRITANCY OF PRODUCT: Contact with the cryogenic liquid or rapidly expanding gases can cause frostbite and damage to exposed skin and eyes.

SENSITIZATION TO PRODUCT: Nitrogen is not a sensitizer.

NAME OF TOXICOLOGICAL SYNERGISTIC PRODUCTS: None.

12. ECOLOGICAL INFORMATION

Nitrogen is naturally occurring in the atmosphere. No adverse ecological effects expected. Nitrogen does not contain any Class I or Class II ozone depleting chemicals. Liquid spills have caused frost damage to vegetation. Nitrogen is not listed as a marine pollutant by DOT.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.
14. TRANSPORTATION INFORMATION

<table>
<thead>
<tr>
<th>PROPER SHIPPING NAME:</th>
<th>Nitrogen, refrigerated liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHIPPING LABEL(S):</td>
<td>Non-flammable, non-corrosive, non-</td>
</tr>
<tr>
<td></td>
<td>poisonous gas</td>
</tr>
<tr>
<td>PRIMARY CLASS:</td>
<td>2.2</td>
</tr>
<tr>
<td>PACKING GROUP:</td>
<td>N/A</td>
</tr>
<tr>
<td>UN NUMBER:</td>
<td>1977</td>
</tr>
<tr>
<td>ERG (2004) NUMBER:</td>
<td>120</td>
</tr>
</tbody>
</table>

SPECIAL TRANSPORT INFORMATION: Containers should be in a secure position when transported, and in a well-ventilated vehicle. Containers transported in an enclosed, non-ventilated vehicle can present a serious safety hazard.

OTHER TRANSPORT INFORMATION: Ensure that drivers are aware of load characteristics, and through TDG training, know what to do in the event of an accident or emergency. Ensure all shipment are moved within applicable regulations.

15. REGULATORY INFORMATION

WHMIS CLASSIFICATION: A (compressed gas)

HMIS RATINGS:

<table>
<thead>
<tr>
<th>Health Hazard (Blue)</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability Hazard (Red)</td>
<td>0</td>
</tr>
<tr>
<td>Physical Hazard (Yellow)</td>
<td>2</td>
</tr>
</tbody>
</table>

CANADIAN DOMESTIC SUBSTANCES LIST: Nitrogen is listed on the DSL inventory.

CANADIAN ENVIRONMENTAL PROTECTION ACT: Nitrogen is not listed on the CEPA priorities substances list.

OTHER CANADIAN REGULATIONS: This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

U.S. TOXIC SUBSTANCE CONTROL ACT: Nitrogen is listed on the US Toxic Substances Control Act (TSCA) inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.
16. OTHER INFORMATION

PREPARED BY: Mark Trevitt
Ferus Gas Industries
Gulf Canada Square, Suite 916, 401-9th Ave SW
Calgary, Alberta T2P 3C5
1-403-517-8777

APPROVED BY: Brent Jones
Ferus Gas Industries
Gulf Canada Square, Suite 916, 401-9th Ave SW
Calgary, Alberta T2P 3C5
1-403-517-8777 ext. 251

PREPARATION DATE: 25/01/05
REVISION DATE: 27/06/05
EXPIRY DATE: 27/06/08

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

(1) Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purposes(s).

(2) Ferus Gas Inc. asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.  Emergency Contact:
150 Allen Road Suite 302 CHEMTREC 1-800-424-9300
Basking Ridge, New Jersey 07920 Calls Originating Outside the US:
Information: 1-800-416-2505 703-527-3887 (Collect Calls Accepted)

SUBSTANCE: NITROGEN, COMPRESSED GAS

TRADE NAMES/SYNONYMS:
MTG MSDS 67; DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2; MAT16625; RTECS QW9700000

CHEMICAL FAMILY: inorganic, gas

CREATION DATE: Jan 24 1989
REVISION DATE: Sep 13 2007

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: NITROGEN, COMPRESSED GAS
CAS NUMBER: 7727-37-9
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: gas
ODOR: odorless
MAJOR HEALTH HAZARDS: difficulty breathing
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma
LONG TERM EXPOSURE: no information is available
SKIN CONTACT:
SHORT TERM EXPOSURE: no information on significant adverse effects
LONG TERM EXPOSURE: no information on significant adverse effects
EYE CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: no information on significant adverse effects
INGESTION:
SHORT TERM EXPOSURE: ingestion of a gas is unlikely
LONG TERM EXPOSURE: ingestion of a gas is unlikely

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash exposed skin with soap and water.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Pressurized containers may rupture or explode if exposed to sufficient heat.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.
6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.

7. HANDLING AND STORAGE


8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
NITROGEN, COMPRESSED GAS:
NITROGEN:
ACGIH (simple asphyxiant)

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Eye protection not required, but recommended.

CLOTHING: Protective clothing is not required.

GLOVES: Protective gloves are not required.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: colorless
ODOR: odorless
TASTE: tasteless
MOLECULAR WEIGHT: 28.0134
MOLECULAR FORMULA: N2
BOILING POINT: -321 F (-196 C)
FREEZING POINT: -346 F (-210 C)
VAPOR PRESSURE: 760 mmHg @ -196 C
VAPOR DENSITY (air=1): 0.967
SPECIFIC GRAVITY: Not applicable
DENSITY: 1.2506 g/L
WATER SOLUBILITY: 1.6% @ 20 C
PH: Not applicable
VOLATILITY: 100%
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not applicable
VIScosity: 0.01787 cP @ 27 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: liquid ammonia
Slightly Soluble: alcohol

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.
CONDITIONS TO AVOID: Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.
INCOMPATIBILITIES: metals, oxidizing materials
HAZARDOUS DECOMPOSITION:
Thermal decomposition products: oxides of nitrogen
POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

Not available

12. ECOLOGICAL INFORMATION

Not available
13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Nitrogen, compressed
ID NUMBER: UN1066
HAZARD CLASS OR DIVISION: 2.2
LABELING REQUIREMENTS: 2.2

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Nitrogen, compressed
UN NUMBER: UN1066
CLASS: 2.2

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.


SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes


STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: A.

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Listed on inventory.

16. OTHER INFORMATION

MSDS SUMMARY OF CHANGES
8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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Material Safety Data Sheet

**WHMIS (Pictograms):**
- A, B-1

**WHMIS (Classification):**
- TDG (Pictograms)

## Section 1. Chemical Product and Company Identification

**Product Name:** PROPANE

**Synonym:** Propane HD-5, Propane commercial, Liquified Petroleum Gas (LPG), C3H8, CGSB Propane Grade 1, CGSB Propane Grade 2, odourized propane, stenched orooane, automotive orooane.

**Manufacturer:** PETRO-CANADA
- P.O. Box 2844
- Calgary, Alberta T2P 3E3

**Material Uses:** Propane is used as a fuel gas, refrigerant, automotive fuel and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks.

**Manufacturer:** Petro-Canada: 403-296-3000
- P.O. Box 2844
- Calgary, Alberta T2P 3E3

**Poison Control Centre:** Consult local telephone directory for emergency number(s).

## Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>% (v/v)</th>
<th>TLV-TWA (NI)</th>
<th>STEL</th>
<th>CEILING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) HD-5 Propane Propane</td>
<td>74-98-6</td>
<td>&gt;90</td>
<td>2500 ppm</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td>2) Commercial Propane Propane</td>
<td>74-98-6</td>
<td>&gt;75</td>
<td>2500 ppm</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td>3) Both grades may contain: Ethane</td>
<td>74-84-0</td>
<td>&lt;5</td>
<td>600 ppm</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td></td>
<td>Butane+</td>
<td>106-97-6</td>
<td>&lt;5</td>
<td>600 ppm</td>
<td>Not established</td>
</tr>
</tbody>
</table>

**Manufacturer:** Not applicable

**Recommendation:** Consult local, state, provincial or territory authorities for acceptable exposure limits.

## Section 3. Hazards Identification

**Potential Health Effects:** The product is contained under pressure. Do not puncture, incinerate or heat container as contents may explode. Flammable gas. Exercise caution when handling this material. Propane may displace oxygen and cause asphyxiation.

Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Contact with gas or liquified gas may cause burns and frostbite to eyes and skin.

Ingestion is not an expected route of exposure. For more information, refer to Section 11.

## Section 4. First Aid Measures

**Eye Contact:** IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.

**Skin Contact:** Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.

**Inhalation:** Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.

**Ingestion:** Ingestion is not an applicable route of exposure for gases.

**Note to Physician:** Not available

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**LPG EMERGENCY RESPONSE ASSISTANCE PLAN®**

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Appendix D – Page 1
**Section 5. Fire-fighting Measures**

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Flammable Limits</th>
<th>Auto-Ignition Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1 - flammable gas (NFPA)</td>
<td>Lower: 2.1%; Upper: 9.5%; (NFPA)</td>
<td>450°C (842°F), (NFPA)</td>
</tr>
</tbody>
</table>

**Fire Hazards in Presence of Various Substances**

- Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapours may generate static charge causing ignition. May accumulate in confined spaces.

**Products of Combustion**

- Carbon oxides (CO, CO2), acrid smoke and irritating vapours as products of incomplete combustion.

**Fire Fighting Media and Instructions**

- NAERG2000, GUIDE 115, Flammable Gas: CAUTION: This product has a low flash point. Use of water spray when fighting fire may be inefficient. SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions. If considered initial evacuation for 1600 meters (1 mile) in all directions. DO NOT extinguish a leaking gas flame unless leak can be stopped. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. Self-contained breathing apparatus (SCBA) will be required if approaching the fire from downwind, or to enter enclosed areas or buildings. Handle damaged cylinders with extreme care.

**Section 6. Accidental Release Measures**

**Material Release or Spill**


**Section 7. Handling and Storage**

**Handling**

EXTREMELY FLAMMABLE GAS. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Ensure all equipment is grounded/bonded. Avoid confined spaces and areas with poor ventilation. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours. Wear proper personal protective equipment (See Section 6). Rapid escape of vapour may generate static charge causing ignition. Use spark-proof electrical equipment. Do not allow escaping compressed gas or liquid to come in contact with skin or eyes as it can cause frostbite.

**Shipping**

- SPECIAL PRECAUTIONS: Sludges and tank scale from propane storage tanks, trucks and rail cars, and filters/scrubbers may contain naturally occurring radioactive material (NORM) in the form of lead 210. Similarly, equipment used for the transfer of propane such as product pipelines, pumps and compressors, may have detectable levels of radioactive lead 210 on inner surfaces. Workers involved in cleaning, repair or other maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities. Suitable codes of practice should be developed for these activities, detailing appropriate occupational hygiene and disposal practices.

**Storage**

- Store away from incompatible and reactive materials (See section 5 and 10). Store away from heat and sources of ignition. Store in flammable material. Compressed gases should be stored in a separate safety storage cabinet or room. Avoid direct sunlight. Keep container tightly closed. Store in dry, cool, well-ventilated area.

**Section 8. Exposure Controls/Personal Protection**

**Engineering Controls**

For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work station.

**Personal Protection**

- **The selection of personal protective equipment varies, depending upon conditions of use.**

  - **Eyes**
    - Eye protection (i.e. safety glasses, safety goggles, and/or face shield) should be based on the condition of use. As a minimum, safety glasses with side shields should be worn when handling this material.

  - **Body**
    - Wear appropriate clothing to prevent skin contact. As a minimum, long sleeves and trousers should be worn.

  - **Respiratory**
    - Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) or where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

  - **Hands**
    - Wear appropriate chemically protective gloves. Wear insulated gloves to prevent frostbite.

  - **Foot**
    - Wear appropriate footwear to prevent product from coming in contact with feet and skin.
Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State and Appearance</td>
<td>Gas at room temperature; liquid when stored under pressure.</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless.</td>
</tr>
<tr>
<td>Odour</td>
<td>Propane is an odourless gas. Odorized propane will contain up to 28 g ethyl mercaptan per 1000 L of propane.</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>Odour is not an adequate warning to prevent overexposure to propane. Prolonged exposure to mercaptans can cause olfactory desensitization.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>-42°C (-44°F)</td>
</tr>
<tr>
<td>Density</td>
<td>508 kg/m³ @ 15°C (59°F)</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>10763 mmHg (1435 kPa) @ 38°C (100°F).</td>
</tr>
<tr>
<td>Vapour Density</td>
<td>1.56 (a=1)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Pour Point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Softening Point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Dropping Point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Slightly soluble in water.</td>
</tr>
<tr>
<td>Dispersion Properties</td>
<td>Not available.</td>
</tr>
<tr>
<td>Density</td>
<td>Oil / Water Dist. Coefficient</td>
</tr>
<tr>
<td>Ionicity (in water)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Physical State</td>
<td>The product is stable under normal handling and storage conditions.</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Will not occur under normal working conditions.</td>
</tr>
<tr>
<td>Decomposition Products</td>
<td>May release CO₂, acrid smoke and irritating vapours when heated to decomposition.</td>
</tr>
<tr>
<td>Incompatible Substances /</td>
<td>Reactive with oxidizing agents.</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Decomposition Products</td>
</tr>
</tbody>
</table>

Section 10. Stability and Reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogenicity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Stability</td>
<td>The product is stable under normal handling and storage conditions.</td>
</tr>
<tr>
<td>Reproductive Toxicity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Mutagenic</td>
<td>This product is not known to contain any components that &gt;= 0.1% that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.</td>
</tr>
<tr>
<td>Teratogenicity/Embryotoxicity</td>
<td>This product is not known to contain any components at &gt;= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.</td>
</tr>
<tr>
<td>Carcinogenicity (ACGIH)</td>
<td>This product is not known to contain any chemicals at reportable quantities that are listed as Group A1 or A2 carcinogens by ACGIH.</td>
</tr>
<tr>
<td>Carcinogenicity (IARC)</td>
<td>This product is not known to contain any chemicals at reportable quantities that are listed as Group 1, 2A, or 2B carcinogens by IARC.</td>
</tr>
</tbody>
</table>

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Appendix D – Page 3
This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.

Carcinogenicity (IRIS): This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.

Carcinogenicity (OSHA): This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.

Section 12. Ecological Information

Environmental Fate Not available Persistence/ Bioaccumulation Potential Not available

BODs and COD Not available Products of Biodegradation Not available

Additional Remarks No additional remark.

Section 13. Disposal Considerations

Waste Disposal Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information


Section 15. Regulatory Information

Other Regulations This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

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

Please contact Product Safety for more information.

DSD/DPD (Europe) Not evaluated. HCS (U.S.A.) CLASS: Flammable gas.

ADR (Europe) (Pictograms) NON EVALUÉ POUR LE TRANSPORT EUROPÉEN. HCS (U.S.A.) CLASS: Compressed gas.

DOT (U.S.A.) (Pictograms) HCS (U.S.A.) CLASS: Toxic gas.

HMIS (U.S.A.) Health Hazard 1 Fire Hazard 4 Reactivity 0 Personal Protection H

NFPA (U.S.A.) Health Hazard Rating 0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme

Section 16. Other Information

References Available upon request. * Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous Goods by Road (Europe)
ASTM - American Society for Testing and Materials
BCD - Biological Oxygen Demand in 5 days
CANS/GAS B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CENICAL - Comprehensive Environmental Response, Compensation and Liability Act
CPR - Code of Federal Regulations
CER - Chemicals Hazard Information and Packaging Approved Supply List
COP - Controlled Products Regulations
DOT - Department of Transport
DSLCL - Dangerous Substances Classification and Labelling (Europe)

Continued on Next Page Internet: www.petro-canada.ca/msds

Available in French

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Appendix D – Page 4
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSD/DPD</td>
<td>Dangerous Substances or Dangerous Preparations Directives (Europe)</td>
</tr>
<tr>
<td>DSL</td>
<td>Domestic Substance List</td>
</tr>
<tr>
<td>EEC/CEU</td>
<td>European Economic Community/European Union</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>EPICRA</td>
<td>Emergency Planning and Community Right to Know Act</td>
</tr>
<tr>
<td>FDA</td>
<td>Food and Drug Administration</td>
</tr>
<tr>
<td>FFRA</td>
<td>Federal Insecticides, Fungicides and Rodenticide Act</td>
</tr>
<tr>
<td>HCS</td>
<td>Hazardous Communication System</td>
</tr>
<tr>
<td>HMIS</td>
<td>Hazardous Material Information System</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>TDG</td>
<td>Transportation Dangerous Goods (Canada)</td>
</tr>
<tr>
<td>TDLoTGLo</td>
<td>Lowest Published Toxic Dose/Concentration</td>
</tr>
<tr>
<td>TLM</td>
<td>Median Tolerance Limit</td>
</tr>
<tr>
<td>TLV-TWA</td>
<td>Threshold Limit Value-Time Weighted Average</td>
</tr>
<tr>
<td>TSCA</td>
<td>Toxic Substances Control Act</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>USP</td>
<td>United States Pharmacopoeia</td>
</tr>
<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Material Information System</td>
</tr>
</tbody>
</table>

For Copy of MSDS
Internet: www.petro-canada.ca/msds

Fuels & Solvents:
Western Canada, Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228
Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385

For Product Safety Information: (905) 804-4752

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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1. Product and company identification

Product name: DIESEL FUEL

Synonym: Seasonal Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, D50, D60, P40, P50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special, Biodiesel blend, B1, B2, B5, Diesel Low Cloud (LC).

Code: W104, W293

Material uses: Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining diesels, marine diesels, MDO and naval distillates may have a higher flash point requirement.

Manufacturer: PETRO-CANADA
P.O. Box 2844
150 – 6th Avenue South-West
Calgary, Alberta
T2P 3E3

In case of emergency:
- Petro-Canada: 403-296-3000
- Canutec Transportation: 613-996-6666
- Poison Control Centre: Consult local telephone directory for emergency number(s).

2. Hazards identification

Physical state: Bright oily liquid.

Odour: Mild petroleum oil like.

WHMIS (Canada):
- Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
- Class D-2A: Material causing other toxic effects (Very toxic).
- Class D-2B: Material causing other toxic effects (Toxic).

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview: WARNING!

COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Combustible liquid. Severely irritating to the skin. Irritating to eyes. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapour or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation: Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include: weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

Ingestion: Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.

Skin: Severely irritating to the skin.

Eyes: Irritating to eyes.

Potential chronic health effects

Chronic effects: No known significant effects or critical hazards.

Carcinogenicity: Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.
2. Hazards identification

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure: Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.

See toxicological information (Section 11)

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrotreated Renewable Diesel/ Fuels, diesel/ Fuel Oil No. 1/ Fuel Oil No. 2</td>
<td>64742-81-0/ 68334-30-5/ 8008-20-6/ 68476-30-2</td>
<td>95 - 100</td>
</tr>
<tr>
<td>Alkanes, C10 – 20 Branched and Linear (R100)</td>
<td>928771-01-1</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Fatty acids methyl esters</td>
<td>67784-80-9/ 73891-99-3</td>
<td>0 - 5</td>
</tr>
</tbody>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First-aid measures

Eye contact: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product: Combustible liquid

Extinguishing media

Suitable: Use dry chemical, CO₂, water spray (fog) or foam.

Not suitable: Do not use water jet.

Special exposure hazards: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Products of combustion: Carbon oxides (CO, CO₂), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H₂S), smoke and irritating vapours as products of incomplete combustion.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
5. Fire-fighting measures

Special remarks on fire hazards: Flammable in presence of open flames, sparks and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.

Special remarks on explosion hazards: Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Runoff to sewer may create fire or explosion hazard.

6. Accidental release measures

Personal precautions: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up:

Small spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

Handling: Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.
8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuels, diesel</td>
<td>ACGIH TLV (United States). Absorbed through skin. TWA: 100 mg/m³, (Inhalable fraction and vapour) 8 hour(s).</td>
</tr>
<tr>
<td>Fuel oil No. 2</td>
<td>ACGIH TLV (United States). Absorbed through skin. TWA: 100 mg/m³, (Inhalable fraction and vapour) 8 hour(s).</td>
</tr>
<tr>
<td>Hydrotreated Renewable Diesel</td>
<td>ACGIH TLV (United States). Absorbed through skin. TWA: 200 mg/m³ 8 hour(s).</td>
</tr>
<tr>
<td>Fuel oil No. 1</td>
<td>ACGIH TLV (United States). Absorbed through skin. TWA: 200 mg/m³ 8 hour(s).</td>
</tr>
</tbody>
</table>

Consult local authorities for acceptable exposure limits.

**Recommended monitoring procedures**: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

**Engineering measures**: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Hygiene measures**: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Personal protection**

**Respiratory**: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

**Hands**: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: nitrile, neoprene, polyvinyl alcohol (PVA), Viton®. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

**Eyes**: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

**Skin**: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Environmental exposure controls**: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
9. Physical and chemical properties

Physical state: Bright oily liquid.

Flash point:
- Diesel fuel and other distillate fuels: Closed cup: $\geq 40^\circ C$ ($\geq 104^\circ F$)
- Marine Diesel/MDO/Naval Distillate: Closed Cup: $\geq 60^\circ C$ ($\geq 140^\circ F$)
- Mining Diesel: Closed Cup: $\geq 52^\circ C$ ($\geq 126^\circ F$)

Auto-ignition temperature: $225^\circ C$ ($437^\circ F$)

Flammable limits:
- Lower: 0.7%
- Upper: 6%

Colour: Clear to yellow (This product may be dyed red for taxation purposes).

Odour: Mild petroleum oil like.

Odour threshold: Not available.

pH: Not available.

Boiling/condensation point: 150 to 371°C (302 to 699.8°F)

Melting/freezing point: Not available.

Relative density:
- 0.80 to 0.88 kg/L @ 15°C (59°F)

Vapour pressure: 1 kPa (7.5 mm Hg) @ 20°C (68°F).

Vapour density: 4.5 [Air = 1]

Vapour pressure:
- Not available.

Vapour density:
- Not available.

Viscosity:
- Diesel fuel: 1.3 - 4.1 cSt @ 40°C (104°F)
- Marine Diesel/MDO/Naval Distillate: 1.3 - 4.4 cSt @ 40°C (104°F)

Pour point: Not available.

Solubility: Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

10. Stability and reactivity

Chemical stability: The product is stable.

Hazardous polymerisation: Under normal conditions of storage and use, hazardous polymerisation will not occur.

Materials to avoid: Reactive with oxidising agents and acids.

Hazardous decomposition products: May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

11. Toxicological information

Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuels, diesel</td>
<td>LD50 Dermal</td>
<td>Mouse</td>
<td>24500 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7500 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Fuel oil No. 2</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Fuel oil No. 1</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Hydrotreated Renewable Diesel</td>
<td>LC50 Inhalation</td>
<td>Rabbit</td>
<td>&gt;5000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>Vapour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;2000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LC50 Inhalation</td>
<td>Rabbit</td>
<td>&gt;5000 mg/m³</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>Vapour</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion/Summary: Not available.

Chronic toxicity: Not available.

Irritation/Corrosion: Not available.

Sensitiser: Not available.
11. Toxicological information

**Conclusion/Summary**: Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

**Carcinogenicity**

**Conclusion/Summary**: Not available.

**Mutagenicity**

**Conclusion/Summary**: Not available.

**Teratogenicity**

**Conclusion/Summary**: Not available.

**Reproductive toxicity**

**Conclusion/Summary**: Not available.

**Classification**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>EPA</th>
<th>NIOSH</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuels, diesel</td>
<td>A3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fuel oil No. 1</td>
<td>A3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fuel oil No. 2</td>
<td>A3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hydrotreated Renewable Diesel</td>
<td>A3</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Ecological information**

**Environmental effects**: No known significant effects or critical hazards.

**Aquatic ecotoxicity**

**Conclusion/Summary**: Not available.

**Biodegradability**

**Conclusion/Summary**: Not available.

13. Disposal considerations

**Waste disposal**: The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

<table>
<thead>
<tr>
<th>Regulatory information</th>
<th>UN number</th>
<th>Proper shipping name</th>
<th>Classes</th>
<th>PG*</th>
<th>Label</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDG Classification</td>
<td>UN1202</td>
<td>DIESEL FUEL</td>
<td>3</td>
<td>III</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>DOT Classification</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
14. Transport information

PG*: Packing group

15. Regulatory information

**United States**

**HCS Classification**: Combustible liquid

Irritating material

**Canada**

**WHMIS (Canada)**:

Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

Class D-2A: Material causing other toxic effects (Very toxic).

Class D-2B: Material causing other toxic effects (Toxic).

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

**International regulations**

Canada inventory: All components are listed or exempted.

United States inventory (TSCA 8b): All components are listed or exempted.

Europe inventory: All components are listed or exempted.

16. Other information

**Label requirements**

COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

**Hazardous Material Information System (U.S.A.)**

Health 2

Flammability 2

Physical hazards 0

Personal protection 2

**National Fire Protection Association (U.S.A.)**

Flammability 2

Health 2

Instability 0

Special

**References**

Available upon request.

**Date of printing**


**Date of issue**

28 June 2013

**Date of previous issue**


**Responsible name**

Sécurité de produit - KKB

Indicates information that has changed from previously issued version.

**For Copy of (M)SDS**

Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

**Notice to reader**
16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.