# Safety Data Sheet (CANADA)

## 1. Identification

**Product Identifier**: Lean Oil

**Other Means of Identification**: Absorber oil

**Product use**: In a gas-processing plant, lean oil is used in an absorber to remove heavier hydrocarbons from the natural gas

**Restrictions on use**: Do not use for purposes other than those listed above

**Manufacturer**: Keyera and Affiliates

**Address**: Suite 600, Sunlife Plaza West
144 – 4th Avenue SW
Calgary, AB, T2P 3N4

**SDS Information**: 1-780-449-7910

**Emergency Contact (24 hours)**: 1-613-996-6666 (CANUTEC, Canada)
1-800-424-9300 (CHEMTREC, U.S.)

## 2. Hazards Identification

**GHS Hazards**

| Pictogram | Classification | Hazard Statements |
|---|---|---|
|  | Flammable Liquids – Category 2 | Highly flammable liquid and vapor. |
|  | Skin corrosion/irritation – Category 2 | Causes skin irritation. |
| | Eye damage/irritation – Category 2A | Causes serious eye irritation. |
|  | Specific Target Organ Toxicity, Single Exposure – Category 1 | Causes damage to central nervous system, kidneys, liver, and respiratory system. |
| | Specific Target Organ Toxicity, Single Exposure – Category 2 | May cause damage to nervous system if swallowed. |
| | Specific Target Organ Toxicity, Single Exposure – Category 3 | May cause drowsiness or dizziness.<br>May cause respiratory irritation. |
| | Specific Target Organ Toxicity, Repeated Exposure – Category 1 | Causes damage to nervous system, central nervous system, and/or respiratory system, hematopoietic system, and/or the kidneys through prolonged or repeated exposure. |
| | Specific Target Organ Toxicity, Repeated Exposure – Category 2 | May cause damage to liver through prolonged or repeated exposure. |

| Pictogram | Classification | Hazard Statements |
|---|---|---|
|  | Aspiration hazard – Category 1 | May be fatal if swallowed and enters airways. |
| | Carcinogenicity – Category 1A | May cause cancer. |
| | Germ cell mutagenicity – Category 1B | May cause genetic defects. |
| | Toxic to reproduction – Category 1A | May damage fertility or the unborn child. |

**Other Hazards**

Repeated exposure may cause skin dryness and cracking.

**Signal Word:** Danger

**Precautionary Statements:**

**Prevention**

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources – No smoking.
- Keep container tightly closed.
- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.

- Do not breathe gas/vapors.
- Wash hands thoroughly after handling.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Do not eat, drink or smoke when using this product.
- Use only outdoors or in a well-ventilated area.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.

**Response**

- In case of fire: Use dry chemical, carbon dioxide, water fog or foam to extinguish.

- If inhaled: Remove person to fresh air and keep comfortable for breathing.
- Call a doctor/physician if you feel unwell.

- If ON SKIN (or hair): Take off contaminated clothing. Rinse skin with water (or shower).
- Wash contaminated clothing before reuse.
- If skin irritation occurs: Get medical advice/attention.
- If exposed or concerned: Get medical advice/attention.

- If in eyes: Rinse cautiously with water for several minutes. Remove contact lens, if present and easy to do. Continue rinsing.
- If eye irritation persists: Get medical advice/attention.

- If swallowed: Immediately call a doctor. Do not induce vomiting.

**Storage**

- Store in a well-ventilated place. Keep cool.
- Keep container tightly closed.
- Store locked up.

**Disposal**

- Dispose of contents/container in accordance with applicable local, provincial/state, and federal regulations.

## 3. Composition/Information on Ingredients

**Chemical Name**: Lean oil

**Common Name/Synonyms**: Absorber oil

Lean oil refers to the oil from which absorbed C1-C4 gases (methanes, ethanes, propanes and butanes) have been stripped/removed. This product consists mainly of C5-C9 hydrocarbons. It is a liquid at normal temperature and pressure.

| Ingredient Name | Wt. % | CAS No. |
|---|---|---|
| Propane | 0 – 0.5% | 74-98-6 |
| n-Butanes | 0 – 3 % | 106-97-8 |
| Iso-butane | 0 – 0.75% | 75-28-5 |
| n-Pentane | 2 – 6 % | 109-66-0 |
| Iso-Pentane | 1 – 5 % | 78-78-4 |
| C6 total (including hexanes) | 9 – 16 % | |
| Benzene ($C_6H_6$) | 1 – 2 % | 71-43-2 |
| C7 total (including heptanes) | 23 – 43 % | |
| Toluene ($C_7H_8$) | 8 – 11 % | 108-88-3 |
| C8 total (including octanes) | 10 – 35 % | |
| Xylenes ($C_8H_{10}$) | 1 – 3 % | 1330-20-7 |
| Ethylbenzene ($C_8H_{10}$) | 0 - 0.5 % | 100-41-4 |
| C9 total (including nonanes) | 1 – 5 % | |
| 1,2,4-Trimethylbenzene ($C_9H_{12}$) | 0 – 0.5 % | 25551-13-7 |
| C10 – C13 | 1 – 40 % | |

## 4. First Aid Measures

**Immediate Medical Attention and Special Treatment:**
Treat symptomatically and supportively. Refer also to Table below.

| **First Aid**: | |
|---|---|
| Inhalation: | Remove person to fresh air and keep comfortable for breathing. Call a doctor/physician if you feel unwell. |
| Skin: | Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: get medical advice/attention. |
| Eyes: | Rinse cautiously with water for several minutes. Remove contact lens, if present and easy to do. Continue rinsing. If eye irritation persists: get medical advice/attention. |
| Ingestion: | Do not induce vomiting. Immediately call a doctor.<br>**Note to Physician:** Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid, which can cause pneumonitis. |

**Most Important Effects and Symptoms, Acute or Delayed:**
An aspiration hazard: may enter directly into the lungs if swallowed or when vomiting the substance.

Benzene, xylene and ethylbenzene are both toxic to the reproductive system and may damage fertility or the unborn child; Toluene and n-Hexane is suspected of damaging fertility or the unborn child.

| **Exposure Route** | **Health Effects** | **Symptoms of Exposure** |
|---|---|---|
| Inhalation: | May cause respiratory irritation and affect the nervous system and the Central Nervous System CNS. | Coughing, itchy throat, dizziness, drowsiness. |
| Skin: | Causes irritation. Prolonged or frequently repeated contact may cause the defatting of skin.<br>See also exposure (skin) to benzene being carcinogen. | Itchiness, redness. Prolonged or repeated exposure causes dryness and skin cracking. |
| Eyes: | Causes serious eye irritation. | Pain, tears, swelling, redness, and blurred vision. |
| Ingestion: | Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death. | Signs and symptoms of aspiration may include coughing, difficulty breathing, “gurgling” lung sounds when breathing, coughing up phlegm (sputum) that is yellow or green in color or bad smelling, change in voice (hoarseness), skin turning bluish due to lack of oxygen. |

## 5. Fire Fighting Measures

| | |
|---|---|
| **Flammability:**<br>Yes. Extremely flammable liquid and vapor. | **Hazardous Combustion Products:**<br>Carbon monoxide (CO), carbon dioxide ($CO_2$), and acrid smoke. |
| **Explosion:**<br>Sensitive to impact: No | **Sensitive to static discharge:**<br>Yes |

**Extinguishing Media:**
Small Fire: dry chemical or $CO_2$.
Large Fire: water spray or fog.

**Unsuitable Extinguishing Media:**

- Foam.
- Water jet: Do not use straight streams. Water may be ineffective because it may not cool the material below the flashpoint

**Special Protective Equipment for Firefighters:**

- Wear full protective clothing and Self-Contained Breathing Apparatus SCBA with full face-piece.
- Structural firefighters' protective clothing will only provide limited protection.

**Precautions for Firefighters:**

- If tank, rail car or tank truck is involved in a fire, ISOLATE and consider initial evacuation in all directions for 800 meters (½ mile).
- Move container from fire area if you can do it without risk.
- Cool fire-exposed containers with flooding quantities of water applied from as far a distance as possible, until well after fire is out.
- Stay away from tanks engulfed in fire.
- Containers exposed to fire may explode or vent through pressure-relief devices.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Refer to Guide 128 of the Emergency Response Guidebook (Transport Canada/US Dept. of Transportation).

**Unusual Fire and Explosion Hazards:**

- Due to low electroconductivity of the substance, liquid can accumulate or generate static charge by flow or agitation. Vapors can be ignited by static discharge.
- The highly flammable vapors are heavier than air and may accumulate in low areas and /or spread along ground to distant ignition sources and flash back.
- The product is not soluble in (and floats on top of) water. Using water as an extinguishment may spread the fire rapidly.
- Can release vapors that form explosive mixtures with air.
- Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back to a leak or open container.

## 6. Accidental Release Measures

**Protective Equipment:**

| | |
|---|---|
| Gloves: | Recommended: neoprene and nitrile; insulating gloves (for liquefied gas). Not recommended: polyvinyl chloride PVC. |
| Clothing: | Flame-retardant coverall e.g. Nomex, Proban. Protective apron and trousers worn over coveralls for handling NGL. |
| Respirator: | NIOSH Approved Supplied-Air Respirator or SCBA where large quantities are released, and the exposure level is unknown or where an oxygen-deficient atmosphere may exist. |
| Eye: | Safety glasses with side shields, safety goggles or face shields. |

**Precautions:**

- Do not breathe vapors.
- The highly flammable vapors are heavier than air and may accumulate in low areas and /or spread along ground to distant ignition sources and flash back.
- Ventilate closed spaces before entering.

**Emergency Procedures:**

- Shut off leak source, if it can be done safely.
- Remove all sources of ignition.
- Isolate hazard area.
- Evacuate area of all unnecessary personnel.
  Small spill: will evaporate.
  Large spill: consider downwind evacuation of at least 300 meters (1000 feet)
  If tank, rail car or tank truck is involved in a fire, ISOLATE and consider initial evacuation in all directions for 800 meters (½ mile).
- Keep unnecessary and unprotected personnel from entering.
- Emergency personnel must wear appropriate personal protective equipment.
- Ventilate area of leak or spill.

**Containment and Clean-up:**

- Use non-sparking tools and equipment.
- All equipment used when handling the product must be grounded and transfer of the product bonded.
- Contain and recover liquid if it can be done safely: Collect spillage with an inert material (e.g., vermiculite, dry sand, earth), and place in metal container which can be grounded.
- Do not use combustible materials, such as sawdust, as absorbent.
- If a leak or spill has not ignited, use water spray to disperse the vapors or divert vapor cloud draft. Do not direct water at spill or source of leak.
- Prevent liquid from spreading to sewers, ventilation systems, confined spaces.
- Dispose of contents/container in accordance with applicable local, provincial/state, and federal regulations.
- Refer to Guide 128 of the Emergency Response Guidebook (Transport Canada/US Dept. of Transportation).

## 7. Handling and Storage

**Handling Precautions :**

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Use only outdoors or in a well-ventilated area.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources – No smoking.
- Keep container tightly closed.
- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.
- Avoid breathing gas/vapors.
- Do not eat, drink or smoke when using this product.
- Wash hands thoroughly after handling.
- Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Storage Precautions:**

Locations

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources – No smoking.
- Outside or detached storage is preferred.
- Storage and use areas should be No Smoking areas.
- Storelocked-up.

Containers

- Keep container tightly closed.
- Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

.

Other precautions

- Separate from incompatibles like oxidizers e.g. chlorine gas and oxygen.

## 8. Exposure Controls / Personal Protection

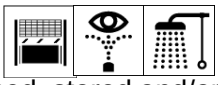
### EXPOSURE LIMITS

Since there is no Occupational Exposure Limits listed for lean oil, the OEL of some major components are listed here.

| | Authority | 15 MINS STEL or Ceiling | 8-HOURS |
|---|---|---|---|
| Butane (all isomers) | Alberta | - | 1000 ppm (2370 mg/m$^3$) |
| | Ontario | - | 800 ppm (1900 mg/m$^3$) |
| | BC | 750 ppm (1778 mg/m$^3$) | 600 ppm (1422 mg/m$^3$) |
| Pentane (all isomers) | Alberta, Ontario | - | 600 ppm (1770 mg/m$^3$) |
| | BC | - | 600 ppm |
| n-Hexane (CAS 110-54-3) | Alberta | - | 50 ppm (176 mg/m$^3$) |
| | BC | - | 20 ppm (skin) |
| | Ontario | - | 50 ppm (skin) |
| Hexane (all other isomers) | Alberta, Ontario | 1000 ppm (3500 mg/m$^3$) | 500 ppm (1760 mg/m$^3$) |
| | BC | - | 200 ppm (680 mg/m$^3$) |
| Heptane (all isomers) | Alberta, Ontario, BC | 500 ppm (2050 mg/m$^3$) | 400 ppm (1640 mg/m$^3$) |
| Octane (all isomers) | Alberta, Ontario, BC | - | 300 ppm (1400 mg/m$^3$) |
| Nonane (all isomers) | Alberta, Ontario, BC | - | 200 ppm (1050 mg/m$^3$) |

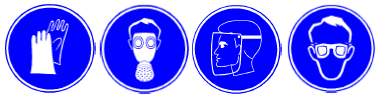
| | | | |
|---|---|---|---|
| Benzene (CAS 71-43-2) | Alberta | 2.5 ppm (8 mg/m$^3$) – skin | 0.5 ppm (1.6 mg/m$^3$) – skin |
| | Ontario, BC | 2.5 ppm – skin | 0.5 ppm – skin |
| Toluene (CAS 108-88-3) | Alberta | - | 50 ppm (188 mg/ m$^3$) |
| | Ontario, BC | - | 20 ppm (75 mg/ m$^3$) |
| Xylene (o-,m-,p- isomers) (CAS 1330-20-7) | Alberta | 150 ppm (650 mg/ m$^3$) | 100 ppm (434 mg/m$^3$) |
| | Ontario, BC | 150 ppm | 100 ppm |
| Methylcyclohexane (CAS 108-87-2) | Alberta, Ontario, BC | - | 400 ppm (1610 mg/m$^3$) |
| Ethylbenzene (CAS 100-41-4) | Alberta | 125 ppm (543 mg/ m$^3$) | 100 ppm (434 mg/ m$^3$) |
| | Ontario, BC | - | 20 ppm (87 mg/ m$^3$) |
| 1,2,4-Trimethylbenzene (all isomers) (CAS 25551-13-7) | Alberta, Ontario, BC | - | 25 ppm (123 mg/ m$^3$) |

## ENGINEERING CONTROLS



- Ventilate area where product is used, stored and/or handled to maintain airborne concentrations below the LEL and OEL, especially in confined spaces.
- Exhaust/ventilate to the outside.
- Supply sufficient replacement air to replace air removed by exhaust systems.
- Ventilation equipment must be explosion proof.
- Ventilation system should be grounded and separate from other exhaust ventilation systems. Adequate make-up air must be provided.
- Emergency eyewash fountain and safety shower must be located in the immediate work area

## PERSONAL PROTECTIVE EQUIPMENT



| | |
|---|---|
| Gloves: | Recommended: neoprene and nitrile;<br>Not recommended: polyvinyl chloride PVC, latex. |
| Clothing: | Flame-retardant coverall e.g. Nomex, Proban.<br>Impervious protective clothing to prevent repeated or prolonged skin contact.<br>Keep contaminated clothing in closed containers. |
| Respirator: | NIOSH Approved Supplied-Air Respirator or SCBA where large concentration is anticipated, and the exposure level is unknown or where an oxygen-deficient atmosphere may exist. |
| Eye: | Safety glasses with side shields, safety goggles or face shields. |

## 9. Physical and Chemical Properties

| | | |
|---|---|---|
| **Chemical Formula:**<br>Not available | **Molecular Weight:**<br>Not available | **Chemical Family:**<br>Hydrocarbon |
| **Appearance:**<br>Dark yellow to brown liquid | **Odor:**<br>Hydrocarbon/ gasoline odor | **Odor Threshold:**<br>Not available |
| **pH:**<br>Not applicable | **Melting/Freezing Point:**<br>Not available | **Boiling Point:**<br>~ 50-55°C (122-131°F) |
| **Boiling Range:**<br>Not available | **Vapor Density:**<br>>1 (air=1) | **Specific Gravity:**<br>~ 0.72-0.73 @STP |
| **Flash Point:**<br><-22°C Closed cup | **Flammability:**<br>Yes | **Evaporation Rate:**<br>Not available |
| **Upper-Lower Explosive Limit:**<br>Not available | **Vapor Pressure:**<br>~ 20-30 kPa @ 37.8°C (100 °F) | **Percent Volatile:**<br>Not available |
| **Soluble in water (@20°C):**<br>Insoluble (negligible solubility) | **Others:**<br>Soluble in organic solvents such as alcohol, ether, chloroform | |
| **Partition Coefficient n-octanol/water:**<br>Not available | **Auto-Ignition Temperature:**<br>Not available | **Decomposition Temp.:**<br>Not available |
| **Viscosity:**<br>Not available | **Henry's Law Constant:**<br>Not available | **Isobaric Heat Capacity:**<br>Not available |

## 10. Stability and Reactivity

**Reactivity:**
Avoid incompatible materials: may react violently with oxidizers.

Avoid heat, sparks, open flames and other sources of ignition. Conditions to avoid: Static discharge, friction. Use only in well ventilated areas.

**Chemical Stability:**
Stable under normal temperatures and pressures.

**Possibility of Hazardous Reactions:**
Polymerization has not been reported to occur under normal temperature and pressure conditions.

**Conditions to Avoid:**
Extreme temperatures and incompatible materials.

**Incompatible Materials:**

- Oxidizers: may react violently with oxidizers such as chlorates, nitrates, peroxides, etc.

**Hazardous Decomposition Products:**

- No decomposition if stored and applied as directed.
- Combustion forms carbon monoxide, carbon dioxide, irritating and toxic fumes/gases.

## 11. Toxicological Information

| Exposure Route | Acute Health Effects | Symptoms of Exposure |
|---|---|---|
| **Inhalation:** | Causes damage to nervous system, central nervous system, kidneys, liver, and respiratory system. | Coughing, itchy throat, dizziness, drowsiness. |
| **Skin:** | Causes irritation. Prolonged or frequently repeated contact may cause the defatting of skin. | Itchiness, redness. Prolonged or repeated exposure causes dryness and skin cracking. |
| **Eye:** | Causes serious eye irritation. | Pain, tears, swelling, redness, and blurred vision. |
| **Ingestion:** | Because of the low viscosity of this substance, it can directly enter the lungs if it is swallowed (this is called aspiration). This can occur during the act of swallowing or when vomiting the substance. Once in the lungs, the substance is very difficult to remove and can cause severe injury to the lungs and death. | Signs and symptoms of aspiration may include coughing, difficulty breathing, "gurgling" lung sounds when breathing, coughing up phlegm (sputum) that is yellow or green in color or bad smelling, change in voice (hoarseness), skin turning bluish due to lack of oxygen. |

**Chronic Exposure:**

**Inhalation:**
Causes damage to nervous system, central nervous system, and/or respiratory system, hematopoietic system, and/or the kidneys through prolonged or repeated exposure. May cause damage to the liver.

**Skin:**
Not known to be a skin-sensitizer. Chronic exposure may cause skin dryness and cracking.

Benzene, one of the component, may cause cancer, and may cause genetic defects. Benzene, toluene, ethylbenzene & xylene are suspected to cause damage to fertility and the unborn child.

**Medical Conditions Aggravated by Exposure:**
Possibly asthma.

| **Sensitization**: No | **Teratogenicity:** No | **Mutagenicity:** Yes | **Irritancy:** Yes | **Aspiration Hazard:** Yes |
|---|---|---|---|---|

**Reproductive Toxicology:**
Yes. Suspected of damaging fertility or the unborn child.

| **Carcinogenicity:** | **Target Organs:** |
|---|---|
| Yes: benzene<br>ACGIH: A1 – confirmed human carcinogen<br>IARC: Group 1 – carcinogenic to human<br>NIOSH: potential occupational carcinogen<br>NTP: Known human carcinogen<br>Ethylbenzene is possibly carcinogenic to humans (IARC, Gp 2B) | Single exposure: nervous system, central nervous system, kidneys, liver and respiratory system.<br>Chronic exposure: nervous system, central nervous system, and/or respiratory system, hematopoietic system, and/or the kidneys. |

**Lethality Tests:**

| Chemical Name | CAS No. | LD50 | LC50 |
|---|---|---|---|
| Isobutane | 75-28-5 | Not available | Rat, inhalation: 658 mg/L 4 hrs<br>Rat, inhalation: 570,000 ppm 15 mins<br>Mouse, inhalation: 52 mg/L 1 hr |
| n-Butane | 106-97-8 | Not available | Rat, inhalation: 658 mg/L 4 hrs<br>Mouse, inhalation: 680 mg/L 2 hrs |
| iso-Pentane | 78-78-4 | Not available | Rat, inhalation: 280 g/m$^3$ 4 hrs |
| n-Pentane | 109-66-0 | Rabbit, dermal: 3000 mg/kg<br>Mouse, oral: 5000 mg/kg | Rat, inhalation: 364 mg/L 4 hrs |
| n-Hexane | 110-54-3 | Adult rats 29700 mg/kg | Rat & Mice, inhalation: 48000 ppm 4 hrs |
| Heptane | 142-82-5 | Mouse, iv 222 mg/kg | Rat inhalation: 103 g/cu m/4 hrs |
| Benzene | 71-43-2 | Rabbit, dermal:>8200 mg/kg<br>Rat, oral: 810 mg/kg | Rat, inhalation: 44.66 mg/L 4 hrs |
| Toluene | 108-88-3 | Rabbit, dermal: 12000 mg/kg<br>Rat, oral: 2600 mg/kg | Rat, inhalation: 12.5 mg/L 4 hrs |
| Xylene (o-,m-,p-Isomers) | 1330-20-7 | Rabbit, dermal: >4350 mg/kg<br>Rat, oral: 3500 mg/kg | Rat, inhalation, vapor: 29.08 mg/L 4 hrs |
| Methylcyclohexane | 108-87-2 | Rat oral >5000 mg/kg | Rat, inhalation: >23.3 mg/L 4 hrs |
| Ethylbenzene | 100-41-4 | Rat, oral: 3500 mg/kg<br>Rabbit, dermal: >5000 mg/kg | Rat, inhalation: 17.2 mg/L 4 hrs |
| 1, 2, 4 – Trimethylbenzene | 25551-13-7 | Rat, oral 5600-8970 mg/kg | Rat, inhalation: 10200 mg/m$^3$ 4 hrs |

## 12. Ecological Information

| | |
|---|---|
| **Persistence & Degradability:**<br>Not expected to persist in the environment. | **Bioaccumulative Potential:**<br>No. |
| **Mobility:**<br>No data available. | **Other Adverse Effects:**<br>See below. |

**Terrestrial Fate:**

- Photolysis and hydrolysis are not expected to be important in soil.
- Not expected to bioaccumulate.
- The lighter, volatile components will evaporate leaving heavier components to undergo slow biodegradation in the soil.
- Spills may contaminate groundwater depending on the level of groundwater table and local geology.

**Aquatic Fate:**

- As condensate is lighter than, and insoluble in water, spills will spread on the water surface and the majority of lighter components up to C5 will evaporate. The heavier components may form sediment in the water systems.
- Hydrolysis is not expected to be an important environmental fate process since the alkanes lack functional groups that hydrolyze under environmental conditions.
- Some components have been identified as hazardous to the aquatic environment under GHS (Globally Harmonized System): Acute Hazard category 2, as toxic to aquatic life: hexane, benzene, toluene, xylenes, ethylbenzene, and 1,2,4-trimethylbenzene.
- Isopentane and n-pentane have been identified as hazardous to the aquatic environment under GHS (Globally Harmonized System): Chronic Hazard category 2, as toxic to aquatic life with long-lasting effects.
- Besides being toxic to aquatic organisms, the condensate film on the water surface may affect oxygen transfer and deplete the water of oxygen necessary for aquatic life.

**Atmospheric Fate:**

- If released to air, the lighter components butanes & pentanes will eveaporate into the atmosphere.
- The Volatile Organic Compound (VOC) components such as butanes and pentanes have the potential to partake in photochemical reactions to produce ozone pollutant.

**Eco Toxicity Tests:**

| Chemical Name | CAS No. | | |
|---|---|---|---|
| n-Pentane | 109-66-0 | Fish | Oncorhynchus mykiss LC50: 9.87 mg/L 96 hrs<br>Pimephales promelas LC50: 11.59 mg/L 96 hrs<br>Lepomis macrochirus LC50: 9.99 mg/L 96 hrs |
| | | Invertebrate | Daphnia magna EC50: 9.74 mg/L 48 hrs |
| iso-Pentane | 78-78-4 | Invertebrate | Daphnia magna EC50: 2.3 mg/L 48 hrs |
| Hexane | 110-54-3 | Fish | Pimephales promelas LC50: 96 h 2.1 - 2.98 mg/L flow-through |
| n-Heptane | 142-82-5 | Fish | Cichlid fish LC50: 96 h 375 mg/L |
| Octane | 111-65-9 | Invertebrate | EC50 48 h water flea 0.38 mg/L |

**Eco Toxicity Tests (continue):**

| Chemical Name | CAS No. | | |
|---|---|---|---|
| Benzene | 71-43-2 | Fish | Oncorhynchus mykiss LC50: 5.3 mg/L 96 hrs flow-through<br><br>Pimephales promelas LC50: 10.7-14.7 mg/L 96 hrs flow-through<br><br>Lepomis macrochirus LC50: 22.4 mg/L 96 hrs static<br>Lepomis macrochirus LC50: 70000-142000 ug/L 96 hrs static<br><br>Precilla reticulata LC50: 28.6 mg/L 96 hrs static |
| | | Algae | Pseudokirchneriella subcapitata EC50: 29 mg/L 72 hrs. |
| | | Invertebrate | Daphnia magna EC50: 8.76-15.6 mg/L 48 hrs static<br>Daphnia magna EC50: 10 mg/L 48 hrs. |
| Toluene | 108-88-3 | Fish | Oncorhynchus mykiss LC50: 5.89-7.81 mg/L 96 hrs flow-through<br>Oncorhynchus mykiss LC50: 14.1-17.16 mg/L 96 hrs static<br>Oncorhynchus mykiss LC50: 5.8 mg/L 96 hrs semi-static<br><br>Pimephales promelas LC50: 15.22-19.05 mg/L 96 hrs flow-through (1 day old)<br>Pimephales promelas LC50: 12.6 mg/L 96 hrs static<br><br>Lepomis macrochirus LC50: 11.0-15.0 mg/L 96 hrs static<br>Oryzias latipes LC50: 54 mg/L 96 hrs static<br><br>Precilla reticulata LC50: 28.2 mg/L 96 hrs semi-static<br>Precilla reticulata LC50: 50.87-70.34 mg/L 96 hrs static |
| | | Algae | Pseudokirchneriella subcapitata EC50: >433 mg/L 72 hrs |
| | | Invertebrate | Daphnia magna EC50: 5.46-9.83 mg/L 48 hrs static |
| Xylene (o-,m-,p-Isomers) | 1330-20-7 | Fish | Oncorhynchus mykiss LC50: 13.5-17.3 mg/L 96 hrs<br>Oncorhynchus mykiss LC50: 2.661-4.093 mg/L 96 hrs static<br><br>Pimephales promelas LC50: 13.4 mg/L 96 hrs flow-through<br>Pimephales promelas LC50: 23.53-29.97 mg/L 96 hrs static<br><br>Lepomis macrochirus LC50: 13.1-16.5 mg/L 96 hrs flow-through<br>Lepomis macrochirus LC50: 19 mg/L 96 hrs<br>Lepomis macrochirus LC50: 7.711-9.591 mg/L 96 hrs static<br><br>Cyprinus carpio LC50: 780 mg/L 96 hrs semi-static<br>Cyprinus carpio LC50: >780 mg/L 96 hrs<br><br>Precilla reticulata LC50: 30.26-40.75 mg/L 96 hrs static |
| | | Invertebrate | Water flea EC50: 3.82 mg/L 48 hrs<br>Gammarus lacustris LC50: 0.6 mg/L 48 hrs |

## 13. Disposal Considerations

**Waste Disposal:**

- Dispose of waste material at an approved waste treatment/disposal facility in accordance with applicable local, provincial, and federal regulations.

## 14. Transport Information

**TDG (CANADA) CLASSIFICATION**

**PROPER SHIPPING NAME:** Petroleum Distillates, N.O.S. **or** Petroleum Products, N.O.S.
**CLASS:** 3 **UN NUMBER:** UN1268
**PACKING GROUP:** II **LABEL/PLACARD:**


**TDG SPECIAL PROVISION:** 91, 92

**MARINE POLLUTANT:** Yes.

## 15. Regulatory Information

**CANADA**

| | Propane | iButane | nButane | iPentane | nPentane | nHexane | nHeptane | nNonane |
|---|---|---|---|---|---|---|---|---|
| CAS | 74-98-6 | 75-28-5 | 106-97-8 | 78-78-4 | 109-66-0 | 110-54-3 | 142-82-5 | 111-84-2 |
| DSL | yes | yes | yes | yes | yes | yes | no | no |
| NPRI | yes | yes | yes | yes | yes | yes | no | no |
| E2 | yes | yes | yes | yes | yes | no | no | no |

| | Benzene | Toluene | Methyl-cyclohexane | Xylenes | Ethylbenzene | 1,2,4-Trimethylbenzene |
|---|---|---|---|---|---|---|
| CAS | 71-43-2 | 108-88-3 | 108-87-2 | 1330-20-7 | 100-41-4 | 25551-13-7 |
| DSL | yes | yes | no | yes | yes | yes |
| NPRI | yes | yes | no | yes | yes | yes |
| E2 | yes | yes | no | yes | yes | no |

## 16. Other Information

Prepared for: Keyera Health and Safety
Issue Date/ Revision No: September 30, 2015/ Revision #2

| Revisions: | Dates: | Main Changes |
|---|---|---|
| • Original: | January 3, 2011 | |
| • 1st revision: | January 31, 2014 | Reformat |
| • 2nd revision | September 30, 2015 | GHS/WHMIS-2015 format |

### Glossary

**ACGIH** – American Conference of Governmental Industrial Hygiene
**DOT** – US Department of Transportation
**DSL –** Domestic Substance List (Canada)
**E2** – Environmental Emergencies (Canada)
**GHS** – Globally Harmonized System
**IARC** – International Agency for Research on Cancer
**IDLH** – Immediately Dangerous to Life and Health
**NIOSH –** National Institute for Occupational Safety & Health
**NPRI** – National Pollutant Release Inventory (Canada)
**NTP** – National Toxicology Program
**OSHA –** Occupational Safety & Health Administration of the US Depart of Labour
**PEL –** Permissible Exposure Limit
**SARA –** Superfund Amendments and Reauthorization Act of 1986
**STEL** – Short Term Exposure Limit
**TRI** – US Toxic Release Inventory
**TSCA** – Toxic Substance Control Act
**TWA** – Time Weighed Average

### Disclaimer of Expressed and Implied Warranties

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**~ End of Safety Data Sheet ~**