

**From:** [Sarah McKenzie](#)  
**To:** [Miki Ehrlich](#)  
**Cc:** [Ann Marie Tout](#); [Deon Bridge](#)  
**Subject:** RE: Information on herbicides  
**Date:** Wednesday, June 19, 2013 1:59:19 PM

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No problem, Miki. Yes they are identical.

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**From:** Miki Ehrlich [mailto:mehrlich@mvlwb.com]  
**Sent:** Wednesday, June 19, 2013 1:57 PM  
**To:** Sarah McKenzie  
**Cc:** Ann Marie Tout; Deon Bridge  
**Subject:** RE: Information on herbicides

Thanks for all of this Sarah, this is super helpful. I had not caught the part in Appendix II.

Just to confirm: Are the MSDS sheets you have supplied here identical to the ones that were submitted for the amendment?

Miki

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**From:** Sarah McKenzie [mailto:[Sarah.McKenzie@enbridge.com](mailto:Sarah.McKenzie@enbridge.com)]  
**Sent:** Thursday, June 13, 2013 3:18 PM  
**To:** Miki Ehrlich  
**Cc:** Ann Marie Tout; Deon Bridge  
**Subject:** RE: Information on herbicides

Hi Miki

In the SCP, Appendix A Table 1 addresses herbicides as a potential hazardous material near KP 447.

In the application (Appendix II, Section 7), I described herbicide use as an activity by referring to the July 2012 amendment materials related to herbicide application near KP 447. The proposed activity has not altered from what was submitted to the Board with the LUP amendment at that time. The new Board LUP Guidelines indicate in Section 4.4.5 '*Renewals*' that if information has already been submitted for a previous LUP, the applicant can reference the information in the renewal application. I wasn't very specific though. The herbicides that will be used, MSDS sheets, storage, location of use and purpose, etc, are all equivalent to the information that was submitted with the July 2012 amendment application for MV2006P0018.

Not including the MSDS sheets in the SCP was an oversight - apologies. I have attached a revised copy of the SCP Appendix D for the Registry and e-file, and will update all of our hardcopies with the additional MSDS sheets (for 2-4-D and Clearview™).

Let me know if you need further info,

Sarah

**Sarah McKenzie, M.A., B.Sc.** | Regulatory Advisor | Enbridge Pipelines Inc.  
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Please consider the environment before printing this e-mail.

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**From:** Miki Ehrlich [<mailto:mehrich@mvlwb.com>]  
**Sent:** Tuesday, June 11, 2013 2:46 PM  
**To:** Sarah McKenzie  
**Cc:** 'Tony Morris'  
**Subject:** Information on herbicides

Hi Sarah,

I was wondering if the herbicides that will be used are included in the application anywhere. I quickly flipped through the MSDS sheets in the Spill Plan and could not find them there. They are not specifically mentioned in the spill plan or the application – unless I am missing something!

Could you please let me know where to find this information, or if it has been omitted from the application, please send in the information on what herbicides will be used, MSDS sheets, storage, location of use and purpose, etc.

Thanks!  
Miki

Miki Ehrlich  
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Please note: All correspondence to the Board, including emails, letters, faxes and attachments are public documents and may be posted to the Public Registry.



## MATERIAL SAFETY DATA SHEET

**PRODUCT NAME:** Hydraulic All Season ISO 32  
**UltraLube® Part Numbers:** 10557

mv2013P0011

**HMIS CODE:** H F R P Health – 0      Fire – 1      Reactivity – 0      Personal Protection - B  
**CHEMICAL FAMILY:** GLYCERIDE OIL-Based Fluid      **CAS NUMBER:** NA

### SECTION I - MANUFACTURER'S IDENTIFICATION

**SOURCE:** Environmental Lubricants Manufacturing, Inc.  
**ADDRESS:** 311 B. Avenue, Grundy Center, IA 50638  
**24 HOUR EMERGENCY ASSISTANCE:** Chemtrec: (800) 424-9300  
**GENERAL MSDS ASSISTANCE:** (319) 824-5203  
**DATE PREPARED:** 08/31/2000  
**DATE REVISED:** 11/16/2010

### SECTION II --COMPOSITION/INFORMATION ON INGREDIENTS

| Compound            | CAS #        | OSHA TWA               | OSHA STEL | ACGIH STEL |
|---------------------|--------------|------------------------|-----------|------------|
| Soybean Oil         | 8001-22-7    | 15 mg/m <sup>3</sup> * | ---       | ---        |
| Additives Mixture** | Confidential | ---                    | ---       | ---        |

\* OSHA TWA limit of 15 mg/m<sup>3</sup> is for vegetable oil mist; however SoyFluid™ Hydraulic All Season is resistant to mist formation

\*\*The specific chemical identity is being withheld as a trade secret by the additive supplier.

--- Not established

THE PRECISE COMPOSITION OF THIS PRODUCT IS PROPRIETARY INFORMATION. A MORE COMPLETE DISCLOSURE WILL BE PROVIDED TO A PHYSICIAN IN THE EVENT OF A MEDICAL EMERGENCY.

SARA HAZARD: NONE NOTED (SECNON 311/312) TITLE III SECTION 313 - NOT LISTED

All components of this product are listed on the TSCA registry.

### SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

**BOILING RANGE:** Not applicable

**VAPOR DENSITY:** Exceeds 1.0

**SPECIFIC GRAVITY (H<sub>2</sub>O=1.0):** 0.892

**VAPOR PRESSURE:** Not applicable

**PERCENT VOLATILE BY VOLUME:** ND

**SOLUBILITY IN WATER:** Insoluble

**EVAPORATION RATE:** Not applicable

**APPEARANCE AND ODOR:** Amber oily liquid with faint odor.

**WEIGHT PER GALLON:** 7.44 lbs. at 60°F.



## **PRECAUTIONS**

### **KEEP OUT OF REACH OF CHILDREN**

May irritate eyes. Avoid contact with eyes

## **PERSONAL PROTECTIVE EQUIPMENT**

**Applicators** must wear coveralls and chemical resistant gloves.

**Mixers and Loaders handling concentrated product**, as an extra precaution, should wear coveralls, chemical resistant gloves, goggles, and rubber boots.

**Worker reentry** – Do not enter or allow worker entry to treated area for 12 hours following application.

If this pest control product is to be used on a commodity that may be exported to the U.S. and you require information on acceptable residue levels in the U.S., visit CropLife Canada's web site at [www.croplife.ca](http://www.croplife.ca).

## **SPRAY DRIFT PRECAUTIONS**

Apply only when the potential for drift to areas of human habitation or areas of human activity such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment and sprayer settings.

## **OPERATOR USE PRECAUTIONS**

- Wash hands before eating, drinking, using tobacco or using the washroom.
- Avoid breathing spray mist.
- If herbicide penetrates clothing remove immediately; then wash thoroughly and put on clean clothing.
- Remove personal protective equipment immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing. Follow manufacturer's instructions for cleaning personal protective clothing and equipment. If no such instructions for washables are provided, use detergent and hot water. Keep and wash personal protective equipment separate from household laundry.

## **FIRST AID**

**Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.**

**If swallowed:** Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.

**If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

## **TOXICOLOGICAL INFORMATION**

No specific antidote. Employ supportive care. Treatment should be based on judgment of the physician in response to reactions of the patient.

## **ENVIRONMENTAL HAZARDS**

TOXIC to terrestrial and aquatic plants. Observe terrestrial and aquatic buffer zones specified under DIRECTIONS FOR USE. The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (e.g., sandy soil) and/or the depth to the water table is shallow. To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay. Avoid application when heavy rain is forecast. Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

## **STORAGE**

Do not ship or store with food, feeds, drugs or clothing.

## **DISPOSAL**

### **Recyclable containers:**

Do not reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or municipality for the location of the nearest collection site. Before taking the container to the collection site:

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Make the empty, rinsed container unsuitable for further use.

If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

### **Returnable containers:**

Do not reuse this container for any purpose. For disposal, this empty container may be returned to the point of purchase (distributor/dealer).

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean-up of spills.

## **GENERAL INFORMATION**

ClearView Herbicide, applied as a post emergent, controls annual and perennial broadleaf weeds, invasive plants and shrubs in rangeland, permanent pasture, rights-of-way, industrial and other non-crop areas. Applications should be avoided under cold or dry conditions or other environmental stresses.

**Read all precaution statements before using this product.** For more information contact your local Dow AgroSciences Canada Inc. representative (1-800-667-3852).

For best results, apply ClearView Herbicide to plants that are actively growing at time of application. Do not apply when temperatures exceed 28° C.

## **GENERAL USE PRECAUTIONS**

ClearView Herbicide is selective and highly active against annual and perennial broadleaf weeds, invasive plants and shrubs. This product is recommended for use on areas where loss of broadleaf forage plants, including legumes, can be tolerated. Injury to or loss of desirable plants may result unless the following precautions are observed. Do not apply or drain or flush equipment on or near desirable vegetation or on areas where their roots may extend or in locations where the chemical may be washed or moved into contact with their roots. Do not apply on walks, driveways, tennis courts or other similar areas.

- Do not apply more than 230 grams per hectare of ClearView Herbicide per annual growing season in rangeland, pasture, industrial, and other non-crop areas.
- Only one application per growing season is permitted.

- Areas treated for 24 months of control should be treated no more than every second year.
- Apply ClearView Herbicide with a recommended surfactant.
- ClearView Herbicide cannot be applied on domestic or commercial turf grass.
- Hay cut from treated grass, in the year of application, should only be used on-farm to feed livestock. The manure or compost from animals fed the treated hay should only be used on registered use sites where the loss of broadleaf forage plants, including legumes, can be tolerated. Contact Dow AgroSciences Canada Inc. for additional information on sensitive broadleaf plant species.

### **Tank Mixtures**

Do not mix or apply this product with any other additive, pesticide or fertilizer except as specifically recommended on this label.

### **DIRECTIONS FOR USE**

READ ALL DIRECTIONS CAREFULLY BEFORE APPLYING. FAILURE TO FOLLOW LABEL INSTRUCTIONS MAY RESULT IN ERRATIC WEED CONTROL.

As this product is not registered for the control of pests in aquatic systems, **DO NOT** use to control aquatic pests. **DO NOT** contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

### **Field sprayer application**

**DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) coarse classification. Boom height must be 60 cm or less above the crop or ground.

### **Aerial application**

**DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply when wind speed is greater than 16 km/h at flying height at the site of application. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) coarse classification. To reduce drift caused by turbulent wingtip vortices, the nozzle distribution along the spray boom length **MUST NOT** exceed 65% of the wing- or rotorspan.

### **Buffer zones**

Use of the following spray methods or equipment **DO NOT** require a buffer zone: hand-held or backpack sprayer and spot treatment.

For application to rights-of-way, buffer zones for protection of sensitive terrestrial habitats are not required; however, the best available application strategies which minimize off-site drift, including meteorological conditions (e.g., wind direction, low wind speed) and spray equipment (e.g., coarse droplet sizes, minimizing height above canopy), should be used. Applicators must, however, observe the specified buffer zones for protection of sensitive aquatic habitats.

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands), sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands) and estuarine/marine habitats.

| Method of application | Crop  |   | Buffer Zones (metres) Required for the Protection of: |                       |
|-----------------------|---|---|---|-----------------------|
|                       |   |   | Freshwater Habitat                                    | Terrestrial habitat** |
| Field sprayer*        | Permanent pasture, rangeland, industrial and other non-crop areas |   | 10  | 15                    |
| Aerial                | Permanent pasture, rangeland, industrial and other non-crop areas | Fixed wing (coarse)                           | 175   | 750                   |
|                       |   | Rotary wing (coarse)                          | 150   | 650                   |
|                       |   | Fixed wing (coarse to very coarse)            | 125   | 475                   |
|                       |   | Rotary wing (coarse to very coarse)           | 100   | 325                   |
|                       |   | Fixed wing (very coarse)                      | 100   | 375                   |
|                       |   | Rotary wing (very coarse)                     | 90  | 225                   |
|                       |   | Fixed wing (very coarse to extremely coarse)  | 80  | 250                   |
|                       |   | Rotary wing (very coarse to extremely coarse) | 70  | 175                   |

\*For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy, the labelled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy, the labelled buffer zone can be reduced by 30%.

\*\*Buffer zones for the protection of terrestrial habitats are not required for use on rights-of-way including railroad ballast, rail and hydro rights-of-way, utility easements, roads, and training grounds and firing ranges on military bases.

For tank mixes, consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture and apply using the coarsest spray (ASAE) category indicated on the labels for those tank mix partners.

## **INDUSTRIAL AREAS (INCLUDING RIGHTS-OF-WAY), OTHER NON-CROP AREAS, RANGELAND AND PERMANENT PASTURE**

### **CLEARVIEW HERBICIDE ALONE**

Apply ClearView Herbicide at a rate of 135 – 230 g/ha. Apply when targeted undesirable vegetation is actively growing. Only weeds and brush present at the time of application will be controlled. Removal of competing vegetation may result in new Canada thistle shoots emerging. Apply using aerial equipment with a minimum of 30 litres spray volume/ha or ground equipment with a minimum of 110 L spray volume/ha, that will assure uniform coverage. For better coverage use 50 litres/ha for aerial application and 200 litres/ha for ground application. Follow all instructions under Mixing Methods for surfactant requirements and order of mixing.



**Weeds Controlled or Suppressed with ClearView Herbicide Alone – Seasonal Control**

| <b>Rate of ClearView Herbicide</b> | <b>Controlled Season Long</b>  | <b>Suppression</b>                                |
|------------------------------------|--|---|
| 135 g/ha                           | Ball mustard, bluebur, Canada fleabane, Canada thistle, chickweed, clover, common groundsel, common ragweed, common tansy, corn spurry, cow cockle, dandelion, field scabious, flixweed, green smartweed, hempnettle, horsenettle, kochia*, lady's thumb, musk or nodding thistle, narrow-leaved hawksbeard, oxeye daisy (pre-bud), perennial sow thistle, plumeless thistle, prostrate pigweed, Russian thistle, scentless chamomile, shepherd's purse, spotted knapweed, stinkweed, stork's bill, sweet clover, tall buttercup, tartary buckwheat, volunteer canola**, western snowberry (buckbrush), wild mustard, yellow starthistle | Canada goldenrod, lamb's quarters, wild buckwheat |
| 170 g/ha                           | Plants listed above plus<br>Cudweed, curly dock, fireweed, perennial pepperweed, pussy toes, volunteer alfalfa, western ragweed, Prairie wild rose, wild strawberry  | Absinth wormwood                                  |
| 230 g/ha                           | Plants listed above plus<br>Absinth wormwood, prickly lettuce  | Yarrow  |

\*Non ALS resistant biotypes

\*\*All varieties except ALS resistant canola

**Weeds Controlled or Suppressed up to 12 Months After Application with ClearView Herbicide Alone**

| <b>Rate of ClearView Herbicide</b> | <b>Controlled up to 12 Months</b>                                       | <b>Suppression up to 12 Months</b>  |
|------------------------------------|---|---|
| 135 g/ha                           | Scentless chamomile   | Canada thistle, dandelion   |
| 170 g/ha                           | Plants listed above plus<br>Canada thistle*, dandelion, wild strawberry | Pasture sage (fringed sage), prairie sage, western snowberry (buckbrush), prairie wild rose |
| 200 g/ha                           | Plants listed above plus<br>prairie wild rose                           |   |
| 230 g/ha                           | Pasture sage (fringed sage)   | Silverberry   |

\*Removal of competing vegetation may result in new Canada thistle shoots emerging.

**Weeds Controlled or Suppressed up to 24 Months After Application with ClearView Herbicide Alone**

| <b>Rate of ClearView Herbicide</b> | <b>Controlled up to 24 Months</b>   | <b>Suppression up to 24 Months</b>   |
|------------------------------------|---|--|
| 170 g/ha                           | Wild strawberry   | Canada thistle*, dandelion, pasture sage (fringed sage), prairie wild rose |
| 200 g/ha                           | Plants listed above   | Western snowberry (buckbrush)  |
| 230 g/ha                           | Plants listed above plus<br>Dandelion, pasture sage (fringed sage), prairie wild rose, Canada thistle |  |

\*Removal of competing vegetation may result in new Canada thistle shoots emerging.

### Preharvest/Grazing Intervals

- There is no restriction on livestock or lactating dairy animals grazing in treated areas.
- Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.

### TANK-MIX COMBINATIONS WITH CLEARVIEW HERBICIDE

ClearView Herbicide can be tank mixed with 2,4-D Amine Herbicide to broaden the spectrum of weeds controlled. When a tank mixture is used, follow all precautions, directions for use, and limitations on the tank-mix partner label. Follow all instructions under Mixing Methods for surfactant requirements and mixing order.

#### Tank-Mix Combination - ClearView Herbicide plus 2,4-D Amine Herbicide – Season Long Control

| Components          | Rate  | Season Long Control  |
|---------------------|---|--|
| ClearView Herbicide | 135 g/ha  | <u>Broadleaf Weeds</u><br>Absinth wormwood, annual sowthistle, blue lettuce (top growth), bull thistle (top growth), burdock < 4 leaf, cocklebur, Canada goldenrod, common plantain, goat's beard, gum weed (topgrowth), hawkweed, hoary cress (top growth), lamb's quarters, pasture sage (fringed sage), stinging nettle, wild buckwheat, prickly lettuce<br><br><u>Shrubs</u><br>silverberry (wolf willow)<br><br>Plus all the weeds on the 2,4-D Amine label at 840-1440 g ae/ha (equivalent to 1.5 - 2.6 L/ha of 2,4-D Amine 600) |
| 2,4-D Amine         | 840-1440 g ae/ha<br><br>(equivalent to 1.5 L/ha of 2,4-D Amine 600) |  |

#### Tank-Mix Combination – ClearView Herbicide plus 2,4-D Amine Herbicide – Season Long Control or Suppression

| Components          | Rate  | Season long Plants Controlled  |
|---------------------|---|--|
| ClearView Herbicide | 170 g/ha  | Plants listed above plus<br><br><u>Broadleaf Weeds</u><br>Prairie sage<br><br><u>Shrubs</u><br>Shrubby cinquefoil<br><br>Plus all the weeds on the 2,4-D Amine label at 840-1440 g ae/ha (equivalent to 1.5 - 2.6 L/ha of 2,4-D Amine 600) |
| 2,4-D Amine         | 840-1440 g ae/ha<br><br>(equivalent to 1.5 - 2.6 L/ha of 2,4-D Amine 600) |  |

#### Tank-Mix Combination - ClearView Herbicide plus 2,4-D Amine Herbicide – Controlled up to 12 Months After Application

| Components          | Rate  | Controlled up to 12 Months After Application |
|---------------------|---|--|
| ClearView Herbicide | 135 g/ha  | Canada thistle*, dandelion, wild strawberry  |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to 2.0 L/ha of 2,4-D Amine 600) |  |

\*Removal of competing vegetation may result in new Canada thistle shoots emerging.

| Components          | Rate  | Controlled up to 12 Months After Application   |
|---------------------|---|--|
| ClearView Herbicide | 170 g/ha  | Plants listed above plus<br><br>Shrubby cinquefoil, western snowberry (buckbrush), prairie wild rose<br><br><u>Weeds suppressed at this rate</u><br>Pasture sage |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to 2.0 L/ha of 2,4-D Amine 600) |  |

| Components          | Rate  | Controlled up to 12 Months After Application  |
|---------------------|---|---|
| ClearView Herbicide | 200 g/ha  | Plants listed above plus<br>Prairie sage, pasture sage (fringed sage), silverberry (wolf willow), |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to 2.0 L/ha of 2,4-D Amine 600) |   |

**Tank-Mix Combination - ClearView Herbicide plus 2,4-D Amine Herbicide – Controlled up to 24 Months After Application**

| Components          | Rate  | Controlled up to 24 Months After Application |
|---------------------|---|--|
| ClearView Herbicide | 135 g/ha  | Dandelion, wild strawberry                   |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to 2.0 L/ha of 2,4-D Amine 600) |  |

| Components          | Rate  | Controlled up to 24 Months After Application   |
|---------------------|---|--|
| ClearView Herbicide | 170 g/ha  | Plants listed above plus<br><br>Pasture sage (fringed sage)<br><br><u>Weeds suppressed at this rate</u><br>Canada thistle, prairie wild rose |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to 2.0 L/ha of 2,4-D Amine 600) |  |

| Components          | Rate  | Controlled up to 24 Months After Application   |
|---------------------|---|--|
| ClearView Herbicide | 200 g/ha  | Plants listed above plus<br><br>Canada thistle*, silverberry (wolf willow), western snowberry (buckbrush), prairie wild rose |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to 2.0 L/ha of 2,4-D Amine 600) |  |

\*Removal of competing vegetation may result in new Canada thistle shoots emerging.

| Components          | Rate   | Controlled up to 24 Months After Application |
|---------------------|--|--|
| ClearView Herbicide | 230 g/ha   | Plants listed above plus                     |
| 2,4-D Amine         | 1.1 kg ae/ha<br><br>(equivalent to<br>2.0 L/ha of<br>2,4-D Amine<br>600) | Prairie sage, shrubby cinquefoil             |

#### **Preharvest/Grazing Intervals for ClearView Herbicide tank mixed with 2,4-D Amine 600.**

- There is no restriction on livestock (except lactating dairy animals) grazing in treated areas
- Do not permit lactating dairy animals to graze fields within 7 days after application.
- Do not harvest forage or cut hay within 30 days after application.
- Withdraw meat animals from treated fields at least 3 days before slaughter.
- Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.

#### **TANK-MIX COMBINATION WITH CLEARVIEW HERBICIDE – Non-cropland Uses**

ClearView Herbicide can be tank mixed with glyphosate to broaden the spectrum of weeds controlled on rights-of-way, industrial and other non-crop areas (where bare ground is desirable). When a tank mixture is used, follow all precautions, directions for use, and limitations on the tank-mix partner label.

#### **Tank-Mix Combination – ClearView Herbicide plus Glyphosate Herbicide**

Use 135 – 230 g/ha ClearView Herbicide tank mixed with 0.8 – 4.3 kg ai/ha glyphosate herbicide (Equivalent to 2.25 – 12.0 L/ha Vantage™ Herbicide Solution or 1.69 – 9.0 L/ha of Vantage Plus MAX Herbicide Solution). A surfactant is required. Follow mixing instructions.

#### **MIXING METHODS**

##### **Mixing with Water**

1. Fill the spray tank 3/4 full of clean water
2. Add the required amount of ClearView Herbicide with the agitation running. Pre-slurrying with water may be necessary where there is little or no agitation or an injection system is being used or where herbicide is first added to a tank other than the spray tank.
3. If tank mixing, add the required amount of 2,4-D Amine Herbicide or glyphosate with the agitation running.
4. Add the recommended surfactant (such as AG-SURF, AGRAL<sup>1</sup> 90 or CITOWETT<sup>2</sup> PLUS) at 0.2% v/v or 2 litres per 1000 litres of spray solution.
5. Add antifoaming agent, if required.

#### **APPLICATION METHODS**

##### **Individual Plant Treatments (or Spot/Strip applications)**

Mix ClearView Herbicide with enough water, surfactant and tank-mix partner (if necessary) to make the correct amount of spray solution. Follow the directions provided above for Mixing with Water. Use equipment designed for individual plant or spot/strip application, backpack sprayers or hose and handgun, to spray weeds. Thoroughly and uniformly wet the foliage of all target plants but not to the point of runoff. No aquatic or terrestrial buffer zones are required for individual plant or spot/strip applications. Direct spray away from aquatic habitats and non-target sensitive terrestrial plants. Do NOT apply this product directly to fresh water habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands), estuaries or marine habitats.

### **Invasive Plant Management**

Early detection and control is a key strategy to prevent the spread of invasive plants. Individual plant treatments or spot/strip applications with ClearView Herbicide on invasive species (susceptible species listed under Application Rates) can be effective in an integrated pest management (IPM) plan. To maximize and extend the benefits of weed/brush control by ClearView Herbicide, other vegetation management practices, such as grazing management, fertilization, prescribed fire, mechanical mowing, hand-pulling, biocontrol and other methods, can be used in appropriate sequences and combinations. Consult local agriculture and land management specialists and invasive plant councils for guidance on best management practices for IPM.

### **Aerial Application**

Use ClearView Herbicide alone, or tank mixed with 2,4-D amine herbicide or glyphosate herbicide, as a broadcast treatment by air to control listed broadleaf weeds and woody plants. Apply ClearView Herbicide at the recommended rates in a minimum spray volume of 30 L/ha by air. For better coverage use 50 litres/ha. Follow all instructions under Mixing Methods for surfactant requirements and order of mixing. Refer to the tank-mix partner label for additional instructions, directions for aerial application and precautions.

Consult the labels of the tank-mix partners and observe the largest (most restrictive) buffer zone of the products involved in the tank mixture.

Apply only by fixed-wing or rotary aircraft equipment which has been functionally and operationally calibrated for the atmospheric conditions of the area and the application rates and conditions of this label.

Label rates, conditions and precautions are product specific. Read and understand the entire label before opening this product. Apply only at the rate recommended for aerial application on this label. Where no rate for aerial application appears for the specific use, this product cannot be applied by any type of aerial equipment.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate swath marking devices.

Apply only when meteorological conditions at the treatment site allow for complete and even crop coverage. Apply only under conditions of good practice specific to aerial application as outlined in the *National Aerial Pesticide Application Manual*, developed by the Federal/Provincial/Territorial Committee on Pest Management and Pesticides.

### **Operator Precautions**

Do not allow the pilot to mix chemicals to be loaded onto the aircraft. Loading of premixed chemicals with a closed system is permitted.

It is desirable that the pilot have communication capabilities at each treatment site at the time of application.

The mixer/loaders must wear chemical resistant gloves, coveralls and goggles or face shield during mixing/loading, cleanup and repair. Follow the more stringent label precautions in cases where the operator precautions exceed the generic label recommendations on the existing ground boom label.

All personnel on the job site must wash hands and face thoroughly before eating and drinking. Protective clothing should be laundered regularly.

### **Product Specific Precautions**

Read and understand the entire label before opening this product. If you have questions, call the manufacturer at 1-800-667-3852 or obtain technical advice from the distributor or your provincial agricultural representative. Application of this specific product must meet and/or conform to the following:

Avoid spray drift at the application site. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. Users are responsible for considering all these factors when making decisions.

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications:

1. The distance of the outer most operating nozzles on the boom must not exceed 75% of the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

### **SPRAYER CLEAN-OUT INSTRUCTIONS**

Do not use spray equipment used to apply ClearView Herbicide for other applications to land planted to, or to be planted to susceptible crops or desirable sensitive plants, unless it has been determined that all residue of this herbicide has been removed by thorough cleaning of equipment.

Equipment used to apply ClearView Herbicide should be thoroughly cleaned before using to apply any other chemicals by following the procedure listed below.

1. Rinse and flush application equipment thoroughly after use. Dispose of rinse water in non-cropland area away from water supplies.
2. Rinse a second time, adding 1 litre of household ammonia or tank cleaning agent for every 1000 L of water. Circulate the solution through the entire system so that all internal surfaces are contacted (15 to 20 minutes). Let the solution stand for several hours, preferably overnight.
3. Flush the solution out the spray tank through the boom.
4. Rinse the system twice with clean water, recirculating and draining each time.
5. Nozzles and screens should be removed and cleaned separately.

### **RESISTANCE MANAGEMENT RECOMMENDATIONS**

For resistance management, ClearView Herbicide is a Group 2 and Group 4 herbicide. Any weed population may contain or develop plants naturally resistant to ClearView Herbicide or other Group 2 and Group 4 herbicides. The resistant biotypes may dominate the weed population if these herbicides are used repeatedly in the same area. Other resistance mechanisms that are not linked to site of action, but specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.

To delay herbicide resistance:

- Where possible, rotate the use of ClearView Herbicide or other Group 2 and Group 4 herbicides with different herbicide groups that control the same weeds in a given treatment area.
- Use tank mixtures with herbicides from a different group when such use is permitted.
- Herbicide use should be based on an IPM program that includes scouting, historical information related to herbicide use, cultural, biological and other chemical control practices.
- Monitor treated weed populations for resistance development.
- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.
- For further information or to report suspected resistance, contact Dow AgroSciences Canada Inc. at 1-800-667-3852.

**NOTICE TO USER:** This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

<sup>TM</sup>Trademark of Dow AgroSciences LLC

<sup>1</sup>AGRAL is a registered trademark of a Syngenta Group Company

<sup>2</sup>CITOWETT PLUS is a registered trademark of BASF AG, used under license by BASF Canada Inc.

052610

Label Code: CN-29752-002-E

Replaces: CN-29752-001-E

Specimen Label Notes

Mixing Chart deleted

| Active Ingredient - 2,4-D DMA (Dimethyl amine)   |                             |                              |                  |                      |                     |                        |                           |               |               |
|--|-----------------------------|------------------------------|------------------|----------------------|---------------------|------------------------|---------------------------|---------------|---------------|
| Trade Names - 2,4-D DMA Unsequestered Weed Killer, Weedar 64   |                             |                              |                  |                      |                     |                        |                           |               |               |
| Characteristics  |                             |                              |                  |                      |                     |                        |                           |               |               |
| Group Number<br>(Mode of Action)   | Acute Mammalian<br>Toxicity | LD50 (rats), oral<br>(mg/kg) | Fish<br>Toxicity | Solubility<br>(mg/L) | Half-Life<br>(days) | Soil Sorption<br>(Koc) | Vapour Pressure<br>(mmHg) | Acid<br>(pKa) | Base<br>(pKb) |
| 4  | Low                         | >1000                        | ---              | Infinite             | <7                  | ---                    | 16.5                      | ---           | ---           |
| Herbicide Evaluation Score*  |                             |                              |                  |                      |                     |                        |                           |               |               |
| None   |                             |                              |                  |                      |                     |                        |                           |               |               |
| Dimethyl amine is mostly used in salt form as an active ingredient in such herbicides as 2,4-D DMA Unsequestered Weed Killer, and Weedar 64. It has a low acute toxicity with an average LD50 (oral) in rats of greater than 1000 mg/kg. |                             |                              |                  |                      |                     |                        |                           |               |               |
| Environmental Considerations   |                             |                              |                  |                      |                     |                        |                           |               |               |
| Direct contamination of any body of water with this product may kill fish. Do not contaminate any body of water by direct application, cleaning of equipment or disposal of wastes.  |                             |                              |                  |                      |                     |                        |                           |               |               |
| Recommended Usage  |                             |                              |                  |                      |                     |                        |                           |               |               |
| To be used only in the manufacture of a herbicide which is registered under the Pest Control Products Act  |                             |                              |                  |                      |                     |                        |                           |               |               |
| Vegetation Controlled by Active Ingredient   |                             |                              |                  |                      |                     |                        |                           |               |               |
| Broadleaf weeds in cereal grains, corn, rice, sugarcane, soybeans, turf, non-crop areas, and certain aquatic applications  |                             |                              |                  |                      |                     |                        |                           |               |               |

### References

- Dow Agro Science- 2,4-D DMA product label. Available at [http://pr-rp.pmra-arla.gc.ca/PR\\_SOL/pr\\_web.ve1?p\\_ukid=1337](http://pr-rp.pmra-arla.gc.ca/PR_SOL/pr_web.ve1?p_ukid=1337)
- Nufarm- Weedar product label available at <http://www.cdms.net/LDat/ld08K018.pdf>

\*Based on Enbridge Herbicide Evaluation Worksheet



| Active Ingredient - Aminopyralid  |                           |                           |                     |                             |                   |                     |                        |            |            |
|---|---------------------------|---------------------------|---------------------|-----------------------------|-------------------|---------------------|------------------------|------------|------------|
| Trade Names - Milestone   |                           |                           |                     |                             |                   |                     |                        |            |            |
| Characteristics   |                           |                           |                     |                             |                   |                     |                        |            |            |
| Group Number (Mode of Action)   | Acute Mammalian Toxicity  | LD50 (rats), oral (mg/kg) | Fish Toxicity       | Solubility (mg/L)           | Half-Life (days)  | Soil Sorption (Koc) | Vapour Pressure (mmHg) | Acid (pKa) | Base (pKb) |
| 4   | Low                       | >5000                     | None                | Dispersible                 | Avg 103(32-533)   | ---                 | ---                    | ---        | ---        |
| Herbicide Evaluation Score*   |                           |                           |                     |                             |                   |                     |                        |            |            |
| Aminopyralid is a chemical used as an active ingredient in Group 4 herbicides including Milestone. The product, applied as a post emergant, controls broadleaf weeds and woody plants in rangeland, permanent pasture, industrial and other non-crop areas.(Brook 2008). Formulations of the herbicide have low acute toxicity with an average LD50 (oral) in rats of >5000 mg/kg (wsdot). Aminopyralid shows moderate mobility in the environment and with a moderate potential to leach through soils and contaminate groundwater (WSDOT i) |                           |                           |                     |                             |                   |                     |                        |            |            |
| Environmental Considerations  |                           |                           |                     |                             |                   |                     |                        |            |            |
| A 10 m buffer zone is required between the point of direct application and the closest downwind edge of non-target sensitive terrestrial and aquatic habitats. Buffer zones are not required for application to right-of-ways for protection of sensitive areas.  |                           |                           |                     |                             |                   |                     |                        |            |            |
| Recommended Usage   |                           |                           |                     |                             |                   |                     |                        |            |            |
| Weeds must be actively growing at time of application. Application should be made before the crop canopy prevents thorough coverage of the weeds. For pasture and rangeland applications the herbicide should be applied once per growing season in mid-June or mid-August after the target species have leafed out, but before fall coloration begins. Applications should be avoided under conditions of drought or other environmental stresses.   |                           |                           |                     |                             |                   |                     |                        |            |            |
| Vegetation Controlled by Active Ingredient  |                           |                           |                     |                             |                   |                     |                        |            |            |
| Weed Species Controlled   |                           |                           |                     |                             | Crop              |                     |                        |            |            |
| Leaf Type   | Season                    | Family                    | Common Name         | Scientific Name             |                   |                     |                        |            |            |
| Broadleaf   | Simple perennial          | Aster                     | Absinth wormwood    | <i>Artemisia absinthium</i> | Rangeland         |                     |                        |            |            |
| Broadleaf   | Creeping perennial        | Aster                     | Canada thistle      | <i>Cirsium arvense</i>      | Permanent pasture |                     |                        |            |            |
| Broadleaf   | Annual/winter             | Aster                     | Scentless chamomile | <i>Matricaria perforata</i> | Industrial areas  |                     |                        |            |            |
| Broadleaf   | Biennial/simple perennial | Aster                     | Spotted knapweed    | <i>Centaurea maculosa</i>   | Non-crop areas    |                     |                        |            |            |
| Weed Species Suppressed   |                           |                           |                     |                             |                   |                     |                        |            |            |
| Broadleaf   | Perennial                 | Aster                     | Canada goldenrod    | <i>Solidago canadensis</i>  |                   |                     |                        |            |            |
| Broadleaf   | Creeping perennial        | Aster                     | Common tansy        | <i>Tanacetum vulgare</i>    |                   |                     |                        |            |            |
| Broadleaf   | Simple perennial          | Aster                     | Dandelion           | <i>Taraxacum officinale</i> |                   |                     |                        |            |            |

### References

- Crop Protection: 2008 & 2009. Alberta Agriculture and Food, 2008 & 2009: Edmonton, AB.
- Oregon State University. Extension Toxicology Network: Pesticide Information Profiles. 1996. <http://extoxnet.orst.edu/pips/ghindex.html> (accessed June 3, 2008).
- Washington State Department of Transportation (WS DOT i). 2006. Roadside Vegetation Management Herbicide Fact Sheet: Bromacil. Website:
- Government of Alberta 2009 <http://www.agric.gov.ab.ca/app23/herbsel>
- CCOHS MSDS search <http://ccinfoweb.ccohs.ca/msds/search.html>
- Bubar, J.B., McColl, S.J., Hall, L.M., 2000. Weeds of the Prairies. Alberta Agriculture, Food, and Rural Development

\*Based on Enbridge Herbicide Evaluation Worksheet

## Active Ingredient - Metsulfuron-methyl

**Trade Names** - Ally Toss-N-Go, Gropper, and Escort

### Characteristics

| Group Number (Mode of Action) | Acute Mammalian Toxicity | LD50 (rats), oral (mg/kg) | Fish Toxicity   | Solubility (mg/L)   | Half-Life (days)       | Soil Sorption (Koc) | Vapour Pressure (mmHg)      | Acid (pKa) | Base (pKb) |
|-------------------------------|--------------------------|---------------------------|-----------------|---------------------|------------------------|---------------------|-----------------------------|------------|------------|
| 2                             | Low(CP08)                | >5000(CP08)               | Very low(WSDOT) | 270-213,000*(WSDOT) | Avg 30 (14-180)(WSDOT) | ---                 | 2.5x10 <sup>-12</sup> (OSU) | ---        | ---        |

### Herbicide Evaluation Score\*

**30**

Metsulfuron-methyl is a chemical used as an active ingredient in Group 2 herbicides including Ally-Toss-N-Go, Allie, Gropper and Escort. Metsulfuron-methyl herbicides can be used as a selective pre- and post emergence herbicide for broadleaf weeds and some annual grasses (Oregon State University 1996). The herbicides may be used on the following crops: Barley, spring and durum wheat, established creeping red fescue, orchard grass, crested and intermediate wheatgrasses. The herbicide can also be used on western snowberry and wild rose within pasture and rangeland. Formulations of the herbicide have low acute toxicity with an average LD50 (oral) in rats of >5000 mg/kg (Brook 2008). Metsulfuron-methyl has an average half life of 30 days, but may last up to 6 months in silty-loam soils.

### Environmental Considerations

The product should not be applied, drained or flushed from equipment on or near desirable plants, on areas where their roots may extend, in locations where their roots may extend, or in areas where the chemical may be washed or moved onto contact with their roots. The product should not be applied to irrigated land where tail water will be used to irrigate other crop land, or to frozen land where runoff may occur. Usage of this product is not recommended within 15 m of a water body, or an vulnerable habitats (shelterbelts, wetlands, sloughs or dry slough borders, and woodlots). (label gov ab herb. catalog)

### Recommended Usage

Weeds must be actively growing at time of application. Application should be made before the crop canopy prevents thorough coverage of the weeds. For pasture and rangeland applications the herbicide should be applied mid-June and mid-August after the target species have leafed out, but before fall coloration begins. (Brook 2008)

### Vegetation Controlled by Active Ingredient

| Weed Species Controlled |                      |            |                            |                                | Formulation            | Crop                      |
|-------------------------|----------------------|------------|----------------------------|--------------------------------|------------------------|---------------------------|
| Leaf Type               | Season               | Family     | Common Name                | Scientific Name                |                        |                           |
| Broadleaf               | Annual               | Aster      | Annual sunflower           |                                | 3g/ac+MCPA+surfactant  | Barley                    |
| Broadleaf               | Annual/winter annual | Mustard    | Ball mustard               | <i>Neslia paniculata</i>       | Ally3g/ac + surfactant | Spring wheat              |
| Broadleaf               | Annual               | Borage     | Bluebur                    | <i>Lappula squarrosa</i>       | Ally3g/ac + surfactant | Durum wheat               |
| Broadleaf               | Annual/winter annual | Pink       | Chickweed                  | <i>Stellaria media</i>         | Ally3g/ac + surfactant | Creeping red fescue       |
| Broadleaf               | Annual/winter annual | Aster      | Common groundsel           | <i>Senecio vulgaris</i>        | Ally3g/ac + surfactant | Orchard grass             |
| Broadleaf               | Annual               | Pink       | Corn spurry                | <i>Spergula arvensis</i>       | Ally3g/ac + surfactant | Crested wheatgrass        |
| Broadleaf               | Annual               | Pink       | Cow cockle                 | <i>Vaccaria pyramidata</i>     | Ally3g/ac + surfactant | Intermediate wheatgrasses |
| Broadleaf               | Annual/winter annual | Mustard    | Flixweed                   | <i>Descurainia sophia</i>      | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Buckwheat  | Green smartweed            | <i>Polygonum scabrum</i>       | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Mint       | Hemp-nettle                | <i>Galeopsis tetrahit</i>      | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Goosefoot  | Kochia                     | <i>Kochia scoparia</i>         | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Buckwheat  | Lady's Thumb               | <i>Polygonum persicaria</i>    | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Goosefoot  | Lamb's-quarters            | <i>Chenopodium album</i>       | 3g/ac+MCPA+surfactant  |                           |
| Broadleaf               | Annual/winter annual | Aster      | Narrow-leaved hawk's-beard | <i>Crepis tectorum</i>         | Ally3g/ac + surfactant |                           |
| Broadleaf               | Perennial            | Platago    | Common plantain            | <i>Plantago major</i>          | 3g/ac+MCPA+surfactant  |                           |
| Broadleaf               | Annual/winter        | Aster      | Pricky lettuce             | <i>Lactuca scariola</i>        | 3g/ac+MCPA+surfactant  |                           |
| Broadleaf               | Annual               | Amarath    | Prostrate pigweed          | <i>Amaranthus blitoides</i>    | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Amarath    | Redroot pigweed            | <i>Amaranthus retroflexus</i>  | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual/winter        | Aster      | Scentless chamomile        | <i>Matricaria perforata</i>    | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual/winter annual | Mustard    | Shepherd's purse           | <i>Capsella bursa-pastoris</i> | Ally3g/ac + surfactant |                           |
| Broadleaf               | annual/winter annual | Mustard    | Stinkweed                  | <i>Thlaspi arvense</i>         | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual/winter        | Geranium   | Stork's bill               | <i>Erodium cicutarium</i>      | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Buckwheat  | Tartary buckwheat          | <i>Fagopyrum tataricum</i>     | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               |            | Volunteer rapeseed         |                                | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Mustard    | Wild mustard               | <i>Brassica kaber</i>          | Ally3g/ac + surfactant |                           |
| Weed Species Supressed  |                      |            |                            |                                | Formulation            |                           |
| Leaf Type               | Season               | Family     | Common Name                | Scientific Name                |                        |                           |
| Broadleaf               | Annual/winter annual | Aster      | Annual sow-thistle         | <i>Sonchus oleraceus</i>       | Ally3g/ac + surfactant |                           |
| Broadleaf               | Creeping perennial   | Aster      | Canada thistle             | <i>Cirsium arvense</i>         | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Goosefoot  | Lamb's-quarters            | <i>Chenopodium album</i>       | Ally3g/ac + surfactant |                           |
| Broadleaf               | Creeping perennial   | Aster      | Perennial sow-thistle      | <i>Sonchus uliginosus</i>      | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Goosefoot  | Russian thistle            | <i>Salsola pestifer</i>        | Ally3g/ac + surfactant |                           |
| Broadleaf               | Creeping perennial   | Snapdragon | Toadflax                   | <i>Linaria vulgaris</i>        | Ally3g/ac + surfactant |                           |
| Broadleaf               | Annual               | Buckwheat  | Wild buckwheat             | <i>Polygonum convolvulus</i>   | Ally3g/ac + surfactant |                           |

\* Depending on pH: Range from 4.6-9.0

#### References

- Crop Protection: 2008 & 2009. Alberta Agriculture and Food, 2008 & 2009: Edmonton, AB.
- Oregon State University. Extension Toxicology Network: Pesticide Information Profiles. 1996. <http://extoxnet.orst.edu/pips/ghindex.html> (accessed June 3, 2008).
- Washington State Department of Transportation (WS DOT i). 2006. Roadside Vegetation Management Herbicide Fact Sheet: Bromacil. Website:
- Government of Alberta 2009 <http://www.agric.gov.ab.ca/app23/herbsel>
- CCOHS MSDS search <http://ccinfoweb.ccohs.ca/msds/search.html>
- Bubar, J.B., McColl, S.J., Hall, L.M., 2000. Weeds of the Prairies. Alberta Agriculture, Food, and Rural Developmer

\*Based on Enbridge Herbicide Evaluation Worksheet

## SECTION IV - FIRE AND EXPLOSION DATA

**FLAMMABILITY CLASSIFICATION:** Combustible Liquid - Class IIIB.

**FLASH POINT:** 208°C (406°F).

**EXTINGUISHING MEDIA:** CO<sub>2</sub>, dry chemical, sand.

**SPECIAL FIREFIGHTING PROCEDURES:** Avoid use of water as it may spread fire by dispersing oil. Use water to keep fire-exposed containers cool.

## SECTION V - REACTIVITY DATA

**STABILITY:** Product is stable under normal usage conditions.

**CONDITIONS TO AVOID:** High surface area exposure to oxygen can result in polymerization and release of heat.

**INCOMPATIBILITY (MATERIALS TO AVOID):** None

**HAZARDOUS DECOMPOSITIONS OR BY-PRODUCTS:** None

**HAZARDOUS POLYMERIZATION:** Will not occur.

## SECTION VI - HEALTH HAZARD DATA

**THRESHOLD LIMIT VALUE:** As a liquid - none.

**INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:** Excessive inhalation of fluid mist may affect the respiratory system. Oil mist is classified as a nuisance particulate by ACGIH.

**SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE:** Sensitive individuals may experience dermatitis after long exposure of oil on skin.

**HEALTH HAZARDS (ACUTE AND CHRONIC):** Acute: none observed by inhalation. Chronic: none reported.

### EMERGENCY AND FIRST AID PROCEDURES FOR:

- **SKIN CONTACT:** May be removed from skin by washing with soap and warm water.
- **INHALATION:** Expose individual to fresh air source.

## SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Depending on quantity of spill: (a) Small spill - add solid adsorbent, shovel into disposable container and hose down area. Clean area with detergent. (b) Large spill - Squeegee or pump into holding container. Clean area with detergent.

**WASTE DISPOSAL METHOD:** Dispose of in accordance with local, state, and federal regulations.

**SECTION VIII - CONTROL MEASURES**

**RESPIRATORY PROTECTION:** Not normally needed.

**VENTILATION:** Intermittent clean air exchanges recommended, but not required.

**PROTECTIVE GLOVES:** Not normally needed.

**EYE PROTECTION:** Not normally needed.

**SECTION IX - SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:** Store away from flame and fire, AND excessive heat.

**X. STATE R-T-K COMPOSITION INFORMATION (and Canada)**

| <b>Component</b>  | <b>CAS #</b> | <b>DSL</b>   | <b>NDSL</b> |
|-------------------|--------------|--------------|-------------|
| Soybean Oil       |              | 8001-22-7    | ---         |
| Additive Mixture* |              | Confidential | ---         |

\* The specific chemical identity is being withheld by suppliers as trade secret.  
--- Not determined

**XI. SARA TITLE III, SECTION 313 INFORMATION:**

This product does not contain any SARA, Title III, Section 313 chemicals.

**XII. RCRA INFORMATION**

Regulated Waste: No

**XIII. CERCLA INFORMATION**

This product contains no materials with reportable quantities.

**XIV. CALIFORNIA PROPOSITION 65 INFORMATION:**

To the best of our knowledge, this product does not contain any California Proposition 65 designated chemicals.

## **XV. TRANSPORTATION INFORMATION**

**D.O.T. Shipping Name:** Not Regulated

**D.O.T. Hazard Class:** Not Regulated

**D.O.T. UN/NA Number:** None

## **XVI. OTHER INFORMATION**

None

## **SECTION XVII - DISCLAIMER AND/OR COMMENTS**

To the best of our knowledge the information contained herein is accurate and reliable as of the date of this material safety data sheet. However no liability whatsoever is assumed 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 health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** (see Section 16 for Synonyms) **UNLEADED GASOLINE**  
**Product Description:** Hydrocarbons and Additives  
**MSDS Number:** 8522

**Intended Use:** Fuel

### COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
 240 4th Avenue  
 Calgary, ALBERTA. T2P 3M9 Canada  
**24 Hour Environmental / Health Emergency Telephone** 1-866-232-9563  
**Transportation Emergency Phone Number** 1-866-232-9563  
**Product Technical Information** 1-800-268-3183  
**Supplier General Contact** 1-800-567-3776

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

### Reportable Hazardous Substance(s) or Complex Substance(s)

| Name                    | CAS#       | Concentration* | Acute Toxicity   |
|-------------------------|------------|----------------|--|
| GASOLINE                | 86290-81-5 | > 99 %         | None   |
| METHYL-TERT-BUTYL ETHER | 1634-04-4  | 0 - 15%        | Dermal Lethality: LD50 > 10.0 g/kg (Rabbit); Inhalation Lethality: LC50 85 mg/l (Rat); Oral Lethality: LD50 4.0 g/kg (Rat) |

### Hazardous Constituent(s) Contained in Complex Substance(s)

| Name          | CAS#     | Concentration* | Acute Toxicity  |
|---------------|----------|----------------|---|
| BENZENE       | 71-43-2  | 0 - 1.5%       | None  |
| CUMENE        | 98-82-8  | 0 - 1%         | Dermal Lethality: LD50 10.6 g/kg (Rabbit); Inhalation Lethality: LC50 8000 ppm (Rat); Oral Lethality: LD50 1.4 g/kg (Rat) |
| CYCLOHEXANE   | 110-82-7 | 0 - 1%         | Dermal Lethality: LD50 > 2000 mg/kg (Rabbit); Inhalation Lethality: LC50 > 19.1 mg/l (Rat)                                |
| ETHYL BENZENE | 100-41-4 | 0 - 3%         | Inhalation Lethality: LC50 17.8 mg/l (Rat); Oral Lethality: LD50 3.5 g/kg (Rat)   |
| n-Hexane      | 110-54-3 | 0 - 3%         | Dermal Lethality: LD50 > 2000 mg/kg (Rabbit); Inhalation Lethality: LC50 > 17.6 mg/l (Rat)                                |
| NAPHTHALENE   | 91-20-3  | 0 - 1%         | Dermal Lethality: LD50 >  |

|         |           |         |  |
|---------|-----------|---------|--|
|         |           |         | 2500 mg/kg (Rat);<br>Inhalation Lethality: LC50 ><br>0.4 mg/l (Rat); Oral Lethality:<br>LD50 622 mg/kg (Mouse) |
| TOLUENE | 108-88-3  | 0 - 20% | None   |
| XYLENES | 1330-20-7 | 0 - 10% | Oral Lethality: LD50 > 5000<br>mg/kg (Rat)   |

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

NOTE: The concentration of the components shown above may vary substantially. In certain countries, benzene content may be limited to lower levels. Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present. Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane, and isopentane. The reportable component percentages, shown in the composition/information on ingredients section, are based on API's evaluation of a typical gasoline mixture.

**SECTION 3 HAZARDS IDENTIFICATION**

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

**PHYSICAL/CHEMICAL EFFECTS**

FLAMMABLE. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

**HEALTH EFFECTS**

May cause cancer. Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage. Exposure to benzene is associated with cancer (acute myeloid leukaemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders (see Section 11).

**Target Organs:** Blood and/or blood-forming organs |

**NFPA Hazard ID:** Health: 1 Flammability: 3 Reactivity: 0  
**HMIS Hazard ID:** Health: 1\* Flammability: 3 Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

**SECTION 4 FIRST AID MEASURES**

**INHALATION**

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**SKIN CONTACT**

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the

appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

#### EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

#### INGESTION

Seek immediate medical attention. Do not induce vomiting.

#### NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. This light hydrocarbon material, or a component, may be associated with cardiac sensitisation following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.

### SECTION 5 FIRE FIGHTING MEASURES

#### EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

#### FIRE FIGHTING

**Fire Fighting Instructions:** Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Extremely Flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger.

**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

#### FLAMMABILITY PROPERTIES

**Flash Point [Method]:** -40°C (-40°F) [ASTM D-92]

**Flammable Limits (Approximate volume % in air):** LEL: 1.4 UEL: 7.6

**Autoignition Temperature:** >250°C (482°F)

### SECTION 6 ACCIDENTAL RELEASE MEASURES

#### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

#### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if



required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H<sub>2</sub>S, or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to aromatic hydrocarbons are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

## SPILL MANAGEMENT

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

## ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

## SECTION 7

## HANDLING AND STORAGE

### HANDLING

Avoid breathing mists or vapour. Avoid contact with skin. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put petrol into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapour and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American

Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

## STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

| Substance Name          | Form    | Limit/Standard |                       |         | Note | Source   |
|-------------------------|---------|----------------|-----------------------|---------|------|----------|
| BENZENE                 |         | STEL           | 1 ppm                 |         |      | Supplier |
| BENZENE                 |         | TWA            | 0.5 ppm               |         |      | Supplier |
| BENZENE                 |         | STEL           | 2.5 ppm               |         | Skin | ACGIH    |
| BENZENE                 |         | TWA            | 0.5 ppm               |         | Skin | ACGIH    |
| CUMENE                  |         | TWA            | 50 ppm                |         |      | ACGIH    |
| CYCLOHEXANE             |         | TWA            | 100 ppm               |         |      | ACGIH    |
| ETHYL BENZENE           |         | TWA            | 20 ppm                |         |      | ACGIH    |
| GASOLINE                |         | STEL           | 200 ppm               |         |      | Supplier |
| GASOLINE                |         | TWA            | 100 ppm               |         |      | Supplier |
| GASOLINE                | Vapour. | TWA            | 300 mg/m <sup>3</sup> | 100 ppm |      | Supplier |
| GASOLINE                |         | STEL           | 500 ppm               |         |      | ACGIH    |
| GASOLINE                |         | TWA            | 300 ppm               |         |      | ACGIH    |
| METHYL-TERT-BUTYL ETHER |         | TWA            | 50 ppm                |         |      | ACGIH    |
| n-Hexane                |         | TWA            | 50 ppm                |         | Skin | ACGIH    |
| NAPHTHALENE             |         | STEL           | 15 ppm                |         | Skin | ACGIH    |
| NAPHTHALENE             |         | TWA            | 10 ppm                |         | Skin | ACGIH    |
| TOLUENE                 |         | TWA            | 20 ppm                |         |      | ACGIH    |
| XYLENES                 |         | STEL           | 150 ppm               |         |      | ACGIH    |
| XYLENES                 |         | TWA            | 100 ppm               |         |      | ACGIH    |

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

## ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Half-face filter respirator

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If prolonged or repeated contact is likely, chemical-resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

|                  |   |
|------------------|---|
| <b>SECTION 9</b> | <b>PHYSICAL AND CHEMICAL PROPERTIES</b> |
|------------------|---|

**Note:** Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

## GENERAL INFORMATION

**Physical State:** Liquid  
**Colour:** Clear (May Be Dyed)  
**Odour:** Petroleum/Solvent  
**Odour Threshold:** N/D

## IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

**Relative Density (at 15 °C):** 0.73

**Flash Point [Method]:** -40°C (-40°F) [ASTM D-92]  
**Flammable Limits (Approximate volume % in air):** LEL: 1.4 UEL: 7.6  
**Autoignition Temperature:** >250°C (482°F)  
**Boiling Point / Range:** 35°C (95°F) - 210°C (410°F)  
**Vapour Density (Air = 1):** 3.2 at 101 kPa  
**Vapour Pressure:** > 26.6 kPa (200 mm Hg) at 20°C | 76 kPa (570 mm Hg) at 38 °C - 103 kPa (772.5 mm Hg) at 38°C  
**Evaporation Rate (n-butyl acetate = 1):** > 10  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** > 3  
**Solubility in Water:** Negligible  
**Viscosity:** <1 cSt (1 mm<sup>2</sup>/sec) at 40°C  
**Oxidizing Properties:** See Hazards Identification Section.

**OTHER INFORMATION**

**Freezing Point:** N/D  
**Melting Point:** N/A

**SECTION 10 STABILITY AND REACTIVITY**

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Avoid heat, sparks, open flames and other ignition sources.

**MATERIALS TO AVOID:** Halogens, Strong Acids, Alkalies, Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**SECTION 11 TOXICOLOGICAL INFORMATION**

**ACUTE TOXICITY**

| <u>Route of Exposure</u>                    | <u>Conclusion / Remarks</u>   |
|---|---|
| <b>Inhalation</b>                           |   |
| Toxicity (Rat): LC50 > 5000 mg/m3           | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation: No end point data for material. | Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components. |
| <b>Ingestion</b>                            |   |
| Toxicity (Rat): LD50 > 2000 mg/kg           | Minimally Toxic. Based on test data for structurally similar materials.   |
| <b>Skin</b>                                 |   |
| Toxicity (Rabbit): LD50 > 2000 mg/kg        | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation: No end point data for material. | Mildly irritating to skin with prolonged exposure. Based on test data for structurally similar materials.   |
| <b>Eye</b>                                  |   |
| Irritation: Data available.                 | May cause mild, short-lasting discomfort to eyes. Based on test   |

|  |
|--|
| data for structurally similar materials. |
|--|

## CHRONIC/OTHER EFFECTS

### For the product itself:

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapours in the same boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats, male and female mice, or in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. In 1991, The U.S. EPA determined that the male rat kidney is not useful for assessing human risk. Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema. Very high exposure (confined spaces / abuse) to light hydrocarbons may result in abnormal heart rhythm (arrhythmias). Concurrent high stress levels and/or co-exposure to high levels of hydrocarbons (above occupational exposure limits), and to heart-stimulating substances like epinephrine, nasal decongestants, asthma drugs, or cardiovascular drugs may initiate arrhythmias.

### Contains:

**BENZENE:** Caused cancer (acute myeloid leukemia and myelodysplastic syndrome), damage to the blood-producing system, and serious blood disorders in human studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus and cancer in laboratory animal studies. **CUMENE:** Repeated inhalation exposure of cumene vapour produced damage in the kidney of male rats only. These effects are believed to be species specific and are not relevant to humans. **GASOLINE UNLEADED:** Carcinogenic in animal tests. Chronic inhalation studies resulted in liver tumours in female mice and kidney tumours in male rats. Neither result considered significant for human health risk assessment by the United States EPA and others. Did not cause mutations in-vitro or in-vivo. Negative in inhalation developmental studies and reproductive tox studies. Inhalation of high concentrations in animals resulted in reversible central nervous system depression, but no persistent toxic effect on the nervous system. Non-sensitizing in test animals. Caused nerve damage in humans from abusive use (sniffing). **METHYL TERTIARY BUTYL ETHER (MTBE):** Carcinogenic in animal tests. Inhalation exposure to high concentrations resulted in higher than expected mortality in male mice due to urinary tract obstructions and female mice displayed benign liver tumours. Inhalation exposure to high concentrations resulted in higher than expected mortality in male rats due to progressive kidney damage as well as increased benign and malignant kidney tumours, and benign testicular tumours. Did not cause mutations in-vitro or in-vivo. Rabbits exposed to high vapour concentrations did not have any offspring with adverse developmental effects. Mice exposed to high vapour concentrations (maternally toxic) had offspring with embryo/fetal toxicity and birth defects. Rats exposed to high vapour concentrations did not display any treatment-related effects in a two generation reproduction study. The significance of the animal findings at high exposures are not believed to be directly related to potential human health hazards in the workplace. **NAPHTHALENE:** Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain. **N-HEXANE:** Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown. **TOLUENE :** Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects. **ETHYLBENZENE:** Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

**XYLENES:** High exposures to xylenes in some animal studies have been reported to cause health effects on the developing embryo/fetus. These effects were often at levels toxic to the mother. The significance of these findings to humans has not been determined.

**CMR Status:**

| Chemical Name           | CAS Number | List Citations |
|-------------------------|------------|----------------|
| BENZENE                 | 71-43-2    | 1, 4, 5        |
| CUMENE                  | 98-82-8    | 4              |
| CYCLOHEXANE             | 110-82-7   | 4              |
| ETHYL BENZENE           | 100-41-4   | 3, 4           |
| GASOLINE                | 86290-81-5 | 3, 4           |
| METHYL-TERT-BUTYL ETHER | 1634-04-4  | 4              |
| n-Hexane                | 110-54-3   | 4              |
| NAPHTHALENE             | 91-20-3    | 3, 4           |
| TOLUENE                 | 108-88-3   | 4              |
| XYLENES                 | 1330-20-7  | 4              |

--REGULATORY LISTS SEARCHED--

1 = IARC 1  
 2 = IARC 2A

3 = IARC 2B  
 4 = ACGIH ALL

5 = ACGIH A1  
 6 = ACGIH A2

**SECTION 12 ECOLOGICAL INFORMATION**

The information given is based on data available for the material, the components of the material, and similar materials.

**ECOTOXICITY**

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

**MOBILITY**

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

**PERSISTENCE AND DEGRADABILITY**

**Biodegradation:**

Majority of components -- Expected to be inherently biodegradable

**Atmospheric Oxidation:**

More volatile component -- Expected to degrade rapidly in air

**BIOACCUMULATION POTENTIAL**

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

## SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

### DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

### REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

## SECTION 14 TRANSPORT INFORMATION

### LAND (TDG)

**Proper Shipping Name:** GASOLINE  
**Hazard Class & Division:** 3  
**UN Number:** 1203  
**Packing Group:** II  
**Marine Pollutant:** Yes  
**Special Provisions:** 17

Footnote: Marine Pollutant designation is applicable only if shipped over water.

### LAND (DOT)

**Proper Shipping Name:** GASOLINE  
**Hazard Class & Division:** 3  
**ID Number:** 1203  
**Packing Group:** II  
**ERG Number:** 128  
**Label(s):** 3  
**Transport Document Name:** UN1203, GASOLINE, 3, PG II

### SEA (IMDG)

**Proper Shipping Name:** MOTOR SPIRIT or GASOLINE or PETROL  
**Hazard Class & Division:** 3  
**EMS Number:** F-E, S-E  
**UN Number:** 1203  
**Packing Group:** II  
**Label(s):** 3  
**Transport Document Name:** UN1203, MOTOR SPIRIT or GASOLINE or PETROL, 3, PG II, (-40°C c.c.)

### AIR (IATA)

**Proper Shipping Name:** MOTOR SPIRIT or GASOLINE or PETROL

**Hazard Class & Division:** 3  
**UN Number:** 1203  
**Packing Group:** II  
**Label(s) / Mark(s):** 3  
**Transport Document Name:** UN1203, GASOLINE, 3, PG II

|                   |                               |
|-------------------|-------------------------------|
| <b>SECTION 15</b> | <b>REGULATORY INFORMATION</b> |
|-------------------|-------------------------------|

**WHMIS Classification:** Class B, Division 2: Flammable Liquids Class D, Division 2, Subdivision A: Very Toxic Material

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**Complies with the following national/regional chemical inventory requirements:** AICS, DSL, ENCS, KECI, PICCS, TSCA

**The Following Ingredients are Cited on the Lists Below:**

| Chemical Name           | CAS Number | List Citations |
|-------------------------|------------|----------------|
| BENZENE                 | 71-43-2    | 6              |
| CUMENE                  | 98-82-8    | 6              |
| CYCLOHEXANE             | 110-82-7   | 6              |
| ETHYL BENZENE           | 100-41-4   | 6              |
| METHYL-TERT-BUTYL ETHER | 1634-04-4  | 6              |
| n-Hexane                | 110-54-3   | 6              |
| NAPHTHALENE             | 91-20-3    | 6              |
| TOLUENE                 | 108-88-3   | 6              |
| XYLENES                 | 1330-20-7  | 6              |

--REGULATORY LISTS SEARCHED--

|              |             |              |
|--------------|-------------|--------------|
| 1 = TSCA 4   | 3 = TSCA 5e | 5 = TSCA 12b |
| 2 = TSCA 5a2 | 4 = TSCA 6  | 6 = NPRI     |

|                   |                          |
|-------------------|--------------------------|
| <b>SECTION 16</b> | <b>OTHER INFORMATION</b> |
|-------------------|--------------------------|

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:  
 Section 11: Additional Health Information was modified.  
 Composition: Component table was modified.



Section 08: Exposure Limits Table was modified.  
Section 04: First Aid Notes was modified.  
Section 11: Chronic Tox - Component - WHMIS was modified.  
Section 04: Pre-existing medical conditions which may be aggravated by exposure - Header was deleted.  
Section 09: Phys/Chem Properties Note was modified.  
Section 09: Boiling Point C(F) was modified.  
Section 08: Comply with applicable regulations phrase was modified.  
Section 09: VAPOUR PRESSURE was modified.  
Section 09: Vapour Pressure was modified.  
Hazard Identification: Health Hazards was modified.  
Section 11: Dermal Irritation Test Data was modified.  
Section 11: Inhalation Irritation Test Data was modified.  
Section 06: Accidental Release-Spill Management-Land was modified.  
Section 09: Relative Density - Header was modified.  
Section 09: Flash Point C(F) was modified.  
Section 09: Autoignition Temperature was modified.  
Section 09 Viscosity was modified.  
Section 04: First Aid Pre-existing Medical Conditions was deleted.  
Section 14: Transport Document Name was modified.  
Section 15: National Chemical Inventory Listing - Header was modified.  
Section 15: National Chemical Inventory Listing was modified.  
Composition: Component table was modified.  
Section 16: Land Spill was modified.  
Section 14: TDG Footnote was added.  
Section 11: Other Health Effects was modified.  
Section 15: Canadian List Citations Table was modified.  
Section 01: Company Contact Methods Sorted by Priority was modified.  
Section 11: Tox List Cited Table was modified.  
Section 06: Protective Measures was modified.

**SYNONYMS:** GASOLINE REGULAR UNLEADED RUL87 LDCA DYED, ESSO EXTRA MIDGRADE GASOLINE, GASOLINE REGULAR UNLEADED RUL87 LDCA, EXXON MIDGRADE GASOLINE, ESSO PREMIUM GASOLINE, ESSO MIDGRADE GASOLINE, ESSO REGULAR GASOLINE, GASOLINE MIDGRADE UNLEADED MUL89 DCA, EXXON REGULAR GASOLINE, GASOLINE MIDGRADE UNLEADED MUL89, EXXON PREMIUM GASOLINE, GASOLINE REGULAR UNLEADED RUL87 DYED, GASOLINE MIDGRADE UNLEADED MUL89 DCA DYED, GASOLINE REGULAR UNLEADED RUL87, GASOLINE PREMIUM UNLEADED PUL91, GASOLINE RBOB BLENDSTOCK P91, GASOLINE RBOB BLENDSTOCK R87, GASOLINE MIDGRADE UNLEADED MUL89 LDCA, GASOLINE MIDGRADE UNLEADED MUL89 LDCA DYED, GASOLINE REGULAR UNLEADED RUL87 DCA, GASOLINE PREMIUM UNLEADED PUL91 DCA DYED, GASOLINE REGULAR UNLEADED RUL87 DCA DYED, GASOLINE PREMIUM UNLEADED PUL91 DCA, GASOLINE PREMIUM UNLEADED PUL91 LDCA, GASOLINE PREMIUM UNLEADED PUL91 LDCA DYED, ISOCTANE, UNLEADED AUTOMOTIVE GASOLINE

-----  
**PRECAUTIONARY LABEL TEXT:**

WHMIS Classification: Class B, Division 2: Flammable Liquids Class D, Division 2, Subdivision A: Very Toxic Material

**HEALTH HAZARDS**

May cause cancer. Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage. May cause central nervous system depression.

**Target Organs:** Blood and/or blood-forming organs |

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**PHYSICAL HAZARDS**

FLAMMABLE. Material can accumulate static charges which may cause an ignition. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited.

**PRECAUTIONS**

Avoid breathing mists or vapour. Avoid contact with skin. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.

**FIRST AID**

**Inhalation:** Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**Eye:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Oral:** Seek immediate medical attention. Do not induce vomiting.

**Skin:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

**FIRE FIGHTING MEDIA**

Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**SPILL/LEAK**

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

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Prepared by: Imperial Oil Limited, IH and Product Safety

# MATERIAL SAFETY DATA SHEET

|                  |   |
|------------------|---|
| <b>SECTION 1</b> | <b>PRODUCT AND COMPANY IDENTIFICATION</b> |
|------------------|---|

## PRODUCT

**Product Name:** EASYMIX 2-CYCLE MOTOR OIL  
**Product Description:** Base Oil and Additives  
**MSDS Number:** 2858  
**Intended Use:** Two cycle engine oil

## COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
240 4th Avenue  
Calgary, ALBERTA. T2P 3M9 Canada  
**24 Hour Environmental / Health Emergency** 519-339-2145  
**Telephone**  
**Transportation Emergency Phone Number** 519-339-2145  
**Product Technical Information** 1-800-268-3183  
**Supplier General Contact** 1-800-567-3776

|                  |   |
|------------------|---|
| <b>SECTION 2</b> | <b>COMPOSITION / INFORMATION ON INGREDIENTS</b> |
|------------------|---|

## Reportable Hazardous Substance(s) or Complex Substance(s)

| Name                          | CAS#       | Concentration* | Acute Toxicity  |
|-------------------------------|------------|----------------|---|
| HYDROTREATED LIGHT DISTILLATE | 64742-47-8 | 20 - 30%       | Dermal Lethality: LD50 > 3000 mg/kg (Rabbit); Oral Lethality: LD50 > 5000 mg/kg (Rat) |

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

|                  |                               |
|------------------|-------------------------------|
| <b>SECTION 3</b> | <b>HAZARDS IDENTIFICATION</b> |
|------------------|-------------------------------|

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

## PHYSICAL/CHEMICAL EFFECTS

Combustible. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

## HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. Breathing of high vapour concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness.

**NFPA Hazard ID:** Health: 0 Flammability: 2 Reactivity: 0  
**HMIS Hazard ID:** Health: 0 Flammability: 2 Reactivity: 0

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

|                  |                           |
|------------------|---------------------------|
| <b>SECTION 4</b> | <b>FIRST AID MEASURES</b> |
|------------------|---------------------------|

**INHALATION**

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**SKIN CONTACT**

Wash contact areas with soap and water.

**EYE CONTACT**

Flush thoroughly with water. If irritation occurs, get medical assistance.

**INGESTION**

First aid is normally not required. Seek medical attention if discomfort occurs.

|                  |                               |
|------------------|-------------------------------|
| <b>SECTION 5</b> | <b>FIRE FIGHTING MEASURES</b> |
|------------------|-------------------------------|

**EXTINGUISHING MEDIA**

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

**FIRE FIGHTING**

**Fire Fighting Instructions:** Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Combustible.

**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

**FLAMMABILITY PROPERTIES**

**Flash Point [Method]:** >65C (149F) [ASTM D-92]

**Flammable Limits (Approximate volume % in air):** LEL: N/D UEL: N/D

**Autoignition Temperature:** N/D

|                  |                                    |
|------------------|------------------------------------|
| <b>SECTION 6</b> | <b>ACCIDENTAL RELEASE MEASURES</b> |
|------------------|------------------------------------|

## NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

## SPILL MANAGEMENT

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces. Recover by pumping or with suitable absorbent.

**Water Spill:** Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

## ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

## SECTION 7

## HANDLING AND STORAGE

### HANDLING

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator.

### STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

## SECTION 8

## EXPOSURE CONTROLS / PERSONAL PROTECTION

| Substance Name   | Form        | Limit/Standard |                        |         | Note | Source   |
|--|-------------|----------------|------------------------|---------|------|----------|
| HYDROTREATED LIGHT DISTILLATE                            | Vapour.     | TWA            | 1200 mg/m <sup>3</sup> | 184 ppm |      | Supplier |
| HYDROTREATED LIGHT DISTILLATE [total hydrocarbon vapour] | Non-Aerosol | TWA            | 200 mg/m <sup>3</sup>  |         | Skin | ACGIH    |

**Exposure limits/standards for materials that can be formed when handling this product:** When mists / aerosols can occur, the following are recommended: 5 mg/m<sup>3</sup> - ACGIH TLV, 10 mg/m<sup>3</sup> - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

## ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective

equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.  
Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

|                  |   |
|------------------|---|
| <b>SECTION 9</b> | <b>PHYSICAL AND CHEMICAL PROPERTIES</b> |
|------------------|---|

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

### GENERAL INFORMATION

**Physical State:** Liquid  
**Colour:** Green  
**Odour:** Characteristic  
**Odour Threshold:** N/D

### IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

**Relative Density (at 15 C):** 0.86  
**Flash Point [Method]:** >65C (149F) [ ASTM D-92]  
**Flammable Limits (Approximate volume % in air):** LEL: N/D UEL: N/D  
**Autoignition Temperature:** N/D  
**Boiling Point / Range:** 150C (302F) - 615C (1139F)  
**Vapour Density (Air = 1):** N/D  
**Vapour Pressure:** 4.2 kPa (31.5 mm Hg) at 20°C  
**Evaporation Rate (n-butyl acetate = 1):** < 1  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** > 3.5  
**Solubility in Water:** Negligible  
**Viscosity:** [N/D at 40°C ]  
**Oxidizing Properties:** See Hazards Identification Section.

### OTHER INFORMATION

**Freezing Point:** N/D  
**Melting Point:** N/A  
**Pour Point:** -39°C (-38°F)  
**DMSO Extract (mineral oil only), IP-346:** < 3 %wt

|                   |                                 |
|-------------------|---------------------------------|
| <b>SECTION 10</b> | <b>STABILITY AND REACTIVITY</b> |
|-------------------|---------------------------------|

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Heat, sparks, flame, and build up of static electricity.

**MATERIALS TO AVOID:** Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

|                   |                                  |
|-------------------|----------------------------------|
| <b>SECTION 11</b> | <b>TOXICOLOGICAL INFORMATION</b> |
|-------------------|----------------------------------|



### ACUTE TOXICITY

| Route of Exposure                    | Conclusion / Remarks  |
|--------------------------------------|---|
| <b>Inhalation</b>                    |   |
| Toxicity (Rat): LC50 > 5000 mg/m3    | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation: No end point data.       | Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components. |
| <b>Ingestion</b>                     |   |
| Toxicity (Rat): LD50 > 2000 mg/kg    | Minimally Toxic. Based on test data for structurally similar materials.   |
| <b>Skin</b>                          |   |
| Toxicity (Rabbit): LD50 > 2000 mg/kg | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation (Rabbit): Data available. | Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.   |
| <b>Eye</b>                           |   |
| Irritation (Rabbit): Data available. | May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.  |

### CHRONIC/OTHER EFFECTS

**For the product itself:**

Vapour/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness and other central nervous system effects including death.

**Contains:**

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

Additional information is available by request.

**CMR Status:** None.

| Chemical Name                 | CAS Number | List Citations |
|-------------------------------|------------|----------------|
| HYDROTREATED LIGHT DISTILLATE | 64742-47-8 | 4              |

--REGULATORY LISTS SEARCHED--

1 = IARC 1  
 2 = IARC 2A

3 = IARC 2B  
 4 = ACGIH ALL

5 = ACGIH A1  
 6 = ACGIH A2

### SECTION 12

### ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

### ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

## MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

## PERSISTENCE AND DEGRADABILITY

### Biodegradation:

Majority of components -- Expected to be inherently biodegradable

### Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

## SECTION 13

## DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

## DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

## REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

## SECTION 14

## TRANSPORT INFORMATION

**LAND (TDG):** Not Regulated for Land Transport

## LAND (DOT)

**Proper Shipping Name:** COMBUSTIBLE LIQUID, N.O.S. (Hydrotreated Light Distillate )

**Hazard Class & Division:** COMBUSTIBLE LIQUID

**ID Number:** NA1993

**Packing Group:** III

**ERG Number:** 128

**Label(s):** NONE

**Transport Document Name:** COMBUSTIBLE LIQUID, N.O.S. (Hydrotreated Light Distillate), COMBUSTIBLE LIQUID, NA1993, PG III

Footnote: This material is not regulated under 49 CFR in a container of 450 litre/119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

**SEA (IMDG):** Not Regulated for Sea Transport according to IMDG-Code

**AIR (IATA):** Not Regulated for Air Transport

|                   |                               |
|-------------------|-------------------------------|
| <b>SECTION 15</b> | <b>REGULATORY INFORMATION</b> |
|-------------------|-------------------------------|

**WHMIS Classification:** Class B, Division 3: Combustible Liquids

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**Complies with the following national/regional chemical inventory requirements:** AICS, KECI, TSCA, DSL  
**Special Cases:**

| Inventory | Status             |
|-----------|--------------------|
| ELINCS    | Restrictions Apply |
| ENCS      | Not determined     |
| IECSC     | Not determined     |
| PICCS     | Not determined     |

**The Following Ingredients are Cited on the Lists Below:**

| Chemical Name                      | CAS Number | List Citations |
|------------------------------------|------------|----------------|
| DIPROPYLENE GLYCOL<br>METHYL ETHER | 34590-94-8 | 1              |

--REGULATORY LISTS SEARCHED--

1 = TSCA 4  
 2 = TSCA 5a2

3 = TSCA 5e  
 4 = TSCA 6

5 = TSCA 12b  
 6 = NPRI

|                   |                          |
|-------------------|--------------------------|
| <b>SECTION 16</b> | <b>OTHER INFORMATION</b> |
|-------------------|--------------------------|

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:

Section 04: First Aid Eye - Header was modified.

Section 04: First Aid Ingestion - Header was modified.

Section 06: Notification Procedures - Header was modified.

Section 11: Acute Toxicity Table Header was modified.  
Section 14: DOT Technical Name - All was modified.  
Section 09: Colour was modified.  
Section 11: Inhalation - Header was modified.  
Section 09: Evaporation Rate - Header was modified.  
Section 09: Vapour Pressure - Header was modified.  
Section 07: Handling and Storage-Handling was modified.  
Section 07: Handling and Storage-Storage Phrases was modified.  
Hazard Identification: Physical/Chemical Hazard was modified.  
Section 11: Inhalation Lethality Test Data was modified.  
Section 05: Hazardous Combustion Products was modified.  
Section 06: Accidental Release- Spill Management- Water was modified.  
Section 09 Viscosity was modified.  
Section 14: Sea (IMDG) - Header was modified.  
Section 14: Air (IATA) - Header was modified.  
Section 14: LAND (TDG) - Header was modified.  
Section 14: LAND (TDG) Default was modified.  
Section 14: Sea (IMDG) - Default was modified.  
Section 14: Air (IATA) - Default was modified.  
Section 15: National Chemical Inventory Listing - Header was modified.  
Section 15: National Chemical Inventory Listing was modified.  
Hazard Identification: Hazards Note was modified.  
Section 16: Health Hazards - Header was modified.  
Section 16: Physical Hazards - Header was modified.  
Section 16: CA Prepared by - Header was modified.  
Section 16: Water Spill was modified.  
Section 16: Physical Hazards additional was modified.  
Section 16: First Aid Inhalation - Header was modified.  
Section 16: Precautions was modified.  
Section 16: Precautionary Label Text - Header was modified.  
Section 09: Oxidizing Properties was modified.  
Section 13: Regulatory Disposal Information - Header was modified.

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#### **PRECAUTIONARY LABEL TEXT:**

WHMIS Classification: Class B, Division 3: Combustible Liquids

#### **HEALTH HAZARDS**

May cause central nervous system depression.

#### **PHYSICAL HAZARDS**

Combustible. Material can accumulate static charges which may cause an ignition.

#### **PRECAUTIONS**

Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.

#### **FIRST AID**

**Inhalation:** Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**Eye:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Skin:** Wash contact areas with soap and water.

**FIRE FIGHTING MEDIA**

Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

**SPILL/LEAK**

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Recover by pumping or with suitable absorbent.

**Water Spill:** Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Report spills as required to appropriate authorities. Seek the advice of a specialist before using dispersants.

**Use**

Not intended or suitable for use in or around a household or dwelling.

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Prepared by: Imperial Oil Limited, IH and Product Safety

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** (see Section 16 for Synonyms) **LIGHT DISTILLATE**  
**Product Description:** Petroleum Distillates  
**MSDS Number:** 8529  
**Intended Use:** Fuel/solvent/blend stock

### COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
 240 4th Avenue  
 Calgary, ALBERTA. T2P 3M9 Canada  
**24 Hour Environmental / Health Emergency Telephone** 519-339-2145  
**Transportation Emergency Phone Number** 519-339-2145  
**Product Technical Information** 1-800-268-3183  
**Supplier General Contact** 1-800-567-3776

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

### Reportable Hazardous Substance(s) or Complex Substance(s)

| Name                                      | CAS#       | Concentration* | Acute Toxicity  |
|---|------------|----------------|---|
| KEROSENE, STRAIGHT RUN                    | 8008-20-6  | 0 - 100%       | Dermal Lethality: LD50 > 2000 mg/kg (Rabbit);<br>Inhalation Lethality: LC50 > 5.0 mg/l (Rat); Oral Lethality: LD50 > 5000 mg/kg (Rat) |
| LIGHT ATMOSPHERIC GAS OIL                 | 64741-44-2 | 0 - 100%       | None  |
| LIGHT HYDROCRACKED DISTILLATE (PETROLEUM) | 64741-77-1 | 0 - 100%       | None  |

### Hazardous Constituent(s) Contained in Complex Substance(s)

| Name        | CAS#    | Concentration* | Acute Toxicity  |
|-------------|---------|----------------|---|
| NAPHTHALENE | 91-20-3 | < 1%           | Dermal Lethality: LD50 > 20 g/kg (Rabbit); Oral Lethality: LD50 0.49 g/kg (Rat) |

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

### PHYSICAL/CHEMICAL EFFECTS

Combustible. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

### HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. Breathing of high vapour concentrations may cause dizziness, light-headedness, headache,

nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. High-pressure injection under skin may cause serious damage.

**Target Organs:** Skin |

|                        |            |                 |               |
|------------------------|------------|-----------------|---------------|
| <b>NFPA Hazard ID:</b> | Health: 2  | Flammability: 2 | Reactivity: 0 |
| <b>HMIS Hazard ID:</b> | Health: 2* | Flammability: 2 | Reactivity: 0 |

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

#### **SECTION 4 FIRST AID MEASURES**

##### **INHALATION**

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

##### **SKIN CONTACT**

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

##### **EYE CONTACT**

Flush thoroughly with water. If irritation occurs, get medical assistance.

##### **INGESTION**

Seek immediate medical attention. Do not induce vomiting.

##### **NOTE TO PHYSICIAN**

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

##### **PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE**

Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

#### **SECTION 5 FIRE FIGHTING MEASURES**

##### **EXTINGUISHING MEDIA**

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

##### **FIRE FIGHTING**

**Fire Fighting Instructions:** Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed

spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Combustible. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

## FLAMMABILITY PROPERTIES

**Flash Point [Method]:** 40C (104F) [ ASTM D-93]

**Flammable Limits (Approximate volume % in air):** LEL: N/D UEL: N/D

**Autoignition Temperature:** N/D

## SECTION 6

## ACCIDENTAL RELEASE MEASURES

### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

### SPILL MANAGEMENT

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

**Water Spill:** Stop leak if you can do so without risk. Eliminate sources of ignition. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

### ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.



**SECTION 7 HANDLING AND STORAGE**

**HANDLING**

Avoid all personal contact. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Loading/Unloading Temperature:** ND

**Transport Temperature:** N/D

**Transport Pressure:** N/D

**Static Accumulator:** This material is a static accumulator.

**STORAGE**

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

**Storage Temperature:** N/D

**Storage Pressure:** N/D

**SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION**

| Substance Name                                      | Form            | Limit/Standard |           |  | Note | Source   |
|---|-----------------|----------------|-----------|--|------|----------|
| KEROSENE, STRAIGHT RUN                              | Stable Aerosol. | TWA            | 5 mg/m3   |  |      | Supplier |
| KEROSENE, STRAIGHT RUN                              | Vapour.         | TWA            | 200 mg/m3 |  |      | Supplier |
| KEROSENE, STRAIGHT RUN [as total hydrocarbon vapor] | Non-Aerosol     | TWA            | 200 mg/m3 |  | Skin | ACGIH    |
| LIGHT ATMOSPHERIC GAS OIL                           | Stable Aerosol. | TWA            | 5 mg/m3   |  |      | Supplier |
| LIGHT ATMOSPHERIC GAS OIL                           | Vapour.         | TWA            | 200 mg/m3 |  |      | Supplier |
| LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)           | Stable Aerosol. | TWA            | 5 mg/m3   |  |      | Supplier |
| LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)           | Vapour.         | TWA            | 200 mg/m3 |  |      | Supplier |
| NAPHTHALENE   |                 | STEL           | 15 ppm    |  | Skin | ACGIH    |
| NAPHTHALENE   |                 | TWA            | 10 ppm    |  | Skin | ACGIH    |

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

## ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

|                  |   |
|------------------|---|
| <b>SECTION 9</b> | <b>PHYSICAL AND CHEMICAL PROPERTIES</b> |
|------------------|---|

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

## GENERAL INFORMATION

**Physical State:** Liquid  
**Colour:** Pale Yellow  
**Odour:** Petroleum/Solvent  
**Odour Threshold:** N/D

## IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

**Relative Density (at 15 C):** 0.85  
**Flash Point [Method]:** 40C (104F) [ ASTM D-93]  
**Flammable Limits (Approximate volume % in air):** LEL: N/D UEL: N/D  
**Autoignition Temperature:** N/D  
**Boiling Point / Range:** 180C (356F) - 320C (608F)  
**Vapour Density (Air = 1):** N/D  
**Vapour Pressure:** [N/D at 20°C] | < 1 kPa (7.5 mm Hg) at 38C  
**Evaporation Rate (n-butyl acetate = 1):** < 1  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** N/D  
**Solubility in Water:** Negligible  
**Viscosity:** 1.7 cSt (1.7 mm<sup>2</sup>/sec) at 40°C  
**Oxidizing Properties:** See Hazards Identification Section.

## OTHER INFORMATION

**Freezing Point:** N/D  
**Melting Point:** N/A  
**Pour Point:** -39°C (-38°F)

## SECTION 10 STABILITY AND REACTIVITY

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Avoid heat, sparks, open flames and other ignition sources.

**MATERIALS TO AVOID:** Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

### ACUTE TOXICITY

| Route of Exposure                             | Conclusion / Remarks  |
|---|---|
| <b>Inhalation</b>                             |   |
| Toxicity (Rat): LC50 > 5000 mg/m <sup>3</sup> | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation: No end point data.                | Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components. |
| <b>Ingestion</b>                              |   |
| Toxicity (Rat): LD50 > 2000 mg/kg             | Minimally Toxic. Based on test data for structurally similar materials.   |

|                                      |   |
|--------------------------------------|---|
| <b>Skin</b>                          |   |
| Toxicity (Rabbit): LD50 > 2000 mg/kg | Minimally Toxic. Based on test data for structurally similar materials.                                       |
| Irritation (Rabbit): Data available. | Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials. |
| <b>Eye</b>                           |   |
| Irritation (Rabbit): Data available. | May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.      |

**CHRONIC/OTHER EFFECTS**

**For the product itself:**

Vapour/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness and other central nervous system effects including death. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

**Contains:**

**KEROSENE:** Carcinogenic in animal tests. Lifetime skin painting tests produced tumours, but the mechanism is due to repeated cycles of skin damage and restorative hyperplasia. This mechanism is considered unlikely in humans where such prolonged skin irritation would not be tolerated. Did not cause mutations in-vitro. Inhalation of vapours did not result in reproductive or developmental effects in laboratory animals. Inhalation of high concentrations in animals resulted in respiratory tract irritation, lung changes and some reduction in lung function. Non-sensitizing in animal tests. **MIDDLE DISTILLATES WITH CRACKED STOCKS:** Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function. **NAPHTHALENE:** Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

Additional information is available by request.

**CMR Status:**

| Chemical Name          | CAS Number | List Citations |
|------------------------|------------|----------------|
| KEROSENE, STRAIGHT RUN | 8008-20-6  | 4              |
| NAPHTHALENE            | 91-20-3    | 3, 4           |

--REGULATORY LISTS SEARCHED--

1 = IARC 1  
 2 = IARC 2A

3 = IARC 2B  
 4 = ACGIH ALL

5 = ACGIH A1  
 6 = ACGIH A2

**SECTION 12 ECOLOGICAL INFORMATION**

The information given is based on data available for the material, the components of the material, and similar materials.

**ECOTOXICITY**

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects

in the aquatic environment.

## MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

## PERSISTENCE AND DEGRADABILITY

### Biodegradation:

Majority of components -- Expected to be inherently biodegradable

### Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

## BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

## SECTION 13

## DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

## DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

## REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

## SECTION 14

## TRANSPORT INFORMATION

## LAND (TDG)

**Proper Shipping Name:** FUEL OIL (Kerosene)

**Hazard Class & Division:** 3

**UN Number:** 1202

**Packing Group:** III

**Marine Pollutant:** Yes

---

Footnote: Marine Pollutant designation is applicable only if shipped over water.

#### LAND (DOT)

**Proper Shipping Name:** DIESEL FUEL  
**Hazard Class & Division:** 3  
**ID Number:** 1993  
**Packing Group:** III  
**ERG Number:** 128  
**Label(s):** None  
**Transport Document Name:** UN1993, DIESEL FUEL, 3, PG III

Footnote: The flash point of this material is greater than 38°C/100°F. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid. This material is not regulated under 49 CFR in a container of 450 litre/119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

#### SEA (IMDG)

**Proper Shipping Name:** HEATING OIL, LIGHT  
**Hazard Class & Division:** 3  
**EMS Number:** F-E, S-E  
**UN Number:** 1202  
**Packing Group:** III  
**Marine Pollutant:** Yes  
**Label(s):** 3  
**Transport Document Name:** UN1202, HEATING OIL, LIGHT, 3, PG III, (40°C c.c.), MARINE POLLUTANT

#### AIR (IATA)

**Proper Shipping Name:** HEATING OIL, LIGHT  
**Hazard Class & Division:** 3  
**UN Number:** 1202  
**Packing Group:** III  
**Label(s) / Mark(s):** 3, EHS  
**Transport Document Name:** UN1202, HEATING OIL, LIGHT, 3, PG III

|                   |
|-------------------|
| <b>SECTION 15</b> |
|-------------------|

|                               |
|-------------------------------|
| <b>REGULATORY INFORMATION</b> |
|-------------------------------|

**WHMIS Classification:** Class B, Division 3: Combustible Liquids Class D, Division 2, Subdivision B: Toxic Material

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**NATIONAL CHEMICAL INVENTORY LISTING:** DSL, TSCA

**Special Cases:**

| Inventory | Status         |
|-----------|----------------|
| AICS      | Not determined |
| EINECS    | Not determined |
| ENCS      | Not determined |
| IECSC     | Not determined |
| KECI      | Not determined |
| PICCS     | Not determined |

**The Following Ingredients are Cited on the Lists Below:**

| Chemical Name | CAS Number | List Citations |
|---------------|------------|----------------|
| NAPHTHALENE   | 91-20-3    | 1, 5, 6        |

--REGULATORY LISTS SEARCHED--

1 = TSCA 4  
 2 = TSCA 5a2

3 = TSCA 5e  
 4 = TSCA 6

5 = TSCA 12b  
 6 = NPRI

**SECTION 16 OTHER INFORMATION**

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:

- Section 04: First Aid Eye - Header was modified.
- Section 04: First Aid Ingestion - Header was modified.
- Section 06: Notification Procedures - Header was modified.
- Section 11: Acute Toxicity Table Header was modified.
- Section 09: Colour was modified.
- Section 09: Physical State was modified.
- Section 11: Inhalation - Header was modified.
- Section 09: Evaporation Rate - Header was modified.
- Section 09: Vapour Pressure - Header was modified.
- Section 07: Handling and Storage-Handling was modified.
- Section 07: Handling and Storage-Storage Phrases was modified.
- Hazard Identification: Physical/Chemical Hazard was modified.
- Section 11: Inhalation Lethality Test Data was modified.
- Section 05: Hazardous Combustion Products was modified.
- Section 06: Accidental Release-Spill Management-Land was modified.
- Section 09 Viscosity was modified.
- Section 14: Label(s) was modified.

Section 15: National Chemical Inventory Listing - Header was modified.  
Hazard Identification: Hazards Note was modified.  
Section 16: Health Hazards - Header was modified.  
Section 16: Physical Hazards - Header was modified.  
Section 16: CA Prepared by - Header was modified.  
Composition: Component table was modified.  
Section 08: Exposure Limits Table was modified.  
Section 16: Land Spill was modified.  
Section 16: Physical Hazards additional was modified.  
Section 16: Precautions was modified.  
Section 16: Precautionary Label Text - Header was modified.  
Section 09: Oxidizing Properties was modified.  
Section 15: Canadian List Citations Table was modified.  
Section 11: Tox List Cited Table was modified.  
Section 13: Regulatory Disposal Information - Header was modified.  
Section 14: Transport Document Name was added.  
Section 14: Transport Document Name was added.  
Section 14: Marine Pollutant - Header was added.  
Section 14: Marine Pollutant was added.  
Section 14: Marine Pollutant - Header was added.  
Section 14: Marine Pollutant was added.  
Section 14: Transport Document Name was added.  
Section 14: TDG Technical Name - All was added.  
Section 14: TDG Technical Name - Close parenthesis was added.  
Section 14: TDG Technical Name - Open parenthesis was added.  
Section 15: Special Cases - Header was added.  
Section 15: Special Cases Table was added.  
Section 15: Inventory - Header was added.  
Section 15: Status - Header was added.  
Section 14: TDG Footnote was added.

**SYNONYMS:** AUTOMOTIVE (ON-ROAD) DIESEL FUEL, DIESEL ARCTIC, DIESEL FUEL, DIESEL LOW SULPHUR LIGHT, DIESEL LOW SULPHUR LIGHT DYED, DIESEL LOW SULPHUR LIGHT RAIL, DIESEL REGULAR SULPHUR LIGHT DYED, FURNACE FUEL LIGHT, FURNACE FUEL LIGHT DYED, MC SOLVENT, STOVE OIL, STOVE OIL DYED

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**PRECAUTIONARY LABEL TEXT:**

WHMIS Classification: Class B, Division 3: Combustible Liquids Class D, Division 2, Subdivision B: Toxic Material

**HEALTH HAZARDS**

Irritating to skin. If swallowed, may be aspirated and cause lung damage.

**Target Organs:** Skin |

**PHYSICAL HAZARDS**

Combustible. In use, may form flammable/explosive vapour-air mixture. Material can accumulate static charges which may cause an ignition.

**PRECAUTIONS**

Avoid all personal contact. Use proper bonding and/or earthing procedures. However, bonding and earthing may not



eliminate the hazard from static accumulation.

## FIRST AID

**Eye:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Oral:** Seek immediate medical attention. Do not induce vomiting.

**Skin:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

## FIRE FIGHTING MEDIA

Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

## SPILL/LEAK

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Do not touch or walk through spilled material.

**Water Spill:** Stop leak if you can do so without risk. Eliminate sources of ignition. Report spills as required to appropriate authorities. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

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Prepared by: Imperial Oil Limited, IH and Product Safety

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** CHAINOIL HEAVY  
**Product Description:** Base Oil and Additives  
**MSDS Number:** 5843  
**Intended Use:** Lubricant

### COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
240 4th Avenue  
Calgary, ALBERTA. T2P 3M9 Canada  
**24 Hour Environmental / Health Emergency Telephone** 519-339-2145  
**Transportation Emergency Phone Number** 519-339-2145  
**Product Technical Information** 1-800-268-3183  
**Supplier General Contact** 1-800-567-3776

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

## SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

### HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

|                        |           |                 |               |
|------------------------|-----------|-----------------|---------------|
| <b>NFPA Hazard ID:</b> | Health: 0 | Flammability: 1 | Reactivity: 0 |
| <b>HMS Hazard ID:</b>  | Health: 0 | Flammability: 1 | Reactivity: 0 |

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

## SECTION 4 FIRST AID MEASURES

### INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

## SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

## EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

## INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

## SECTION 5 FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

### FIRE FIGHTING

**Fire Fighting Instructions:** Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

### FLAMMABILITY PROPERTIES

**Flash Point [Method]:** 190C (374F) [ASTM D-92]

**Flammable Limits (Approximate volume % in air):** LEL: 0.9 UEL: 7.0

**Autoignition Temperature:** N/D

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

### SPILL MANAGEMENT

**Land Spill:** Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

**Water Spill:** Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other

shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

## ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

## SECTION 7 HANDLING AND STORAGE

### HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator.

### STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure limits/standards for materials that can be formed when handling this product:

When mists / aerosols can occur, the following are recommended: 5 mg/m<sup>3</sup> - ACGIH TLV, 10 mg/m<sup>3</sup> - ACGIH STEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

### ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

### PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the

selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

|                  |   |
|------------------|---|
| <b>SECTION 9</b> | <b>PHYSICAL AND CHEMICAL PROPERTIES</b> |
|------------------|---|

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

## GENERAL INFORMATION

**Physical State:** Liquid

**Colour:** Red

**Odour:** Characteristic

**Odour Threshold:** N/D

## IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

**Relative Density (at 15 C):** 0.89

**Flash Point [Method]:** 190C (374F) [ASTM D-92]

**Flammable Limits (Approximate volume % in air):** LEL: 0.9 UEL: 7.0  
**Autoignition Temperature:** N/D  
**Boiling Point / Range:** 315C (599F) - 615C (1139F)  
**Vapour Density (Air = 1):** > 2 at 101 kPa  
**Vapour Pressure:** < 0.1 kPa (0.75 mm Hg) at 20°C  
**Evaporation Rate (n-butyl acetate = 1):** < 0.1  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** > 3.5  
**Solubility in Water:** Negligible  
**Viscosity:** 150 cSt (150 mm<sup>2</sup>/sec) at 40°C  
**Oxidizing Properties:** See Hazards Identification Section.

### OTHER INFORMATION

**Freezing Point:** N/D  
**Melting Point:** N/A  
**Pour Point:** -9°C (16°F)  
**DMSO Extract (mineral oil only), IP-346:** < 3 %wt

|                   |                                 |
|-------------------|---------------------------------|
| <b>SECTION 10</b> | <b>STABILITY AND REACTIVITY</b> |
|-------------------|---------------------------------|

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Excessive heat. High energy sources of ignition.

**MATERIALS TO AVOID:** Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

|                   |                                  |
|-------------------|----------------------------------|
| <b>SECTION 11</b> | <b>TOXICOLOGICAL INFORMATION</b> |
|-------------------|----------------------------------|

#### ACUTE TOXICITY

| <u>Route of Exposure</u>                      | <u>Conclusion / Remarks</u>   |
|---|---|
| <b>Inhalation</b>                             |   |
| Toxicity (Rat): LC50 > 5000 mg/m <sup>3</sup> | Minimally Toxic. Based on test data for structurally similar materials.                                       |
| Irritation: No end point data.                | Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.             |
| <b>Ingestion</b>                              |   |
| Toxicity (Rat): LD50 > 5000 mg/kg             | Minimally Toxic. Based on test data for structurally similar materials.                                       |
| <b>Skin</b>                                   |   |
| Toxicity (Rabbit): LD50 > 5000 mg/kg          | Minimally Toxic. Based on test data for structurally similar materials.                                       |
| Irritation (Rabbit): Data available.          | Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials. |
| <b>Eye</b>                                    |   |
| Irritation (Rabbit): Data available.          | May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.      |

## CHRONIC/OTHER EFFECTS

### Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitising in test animals.

Additional information is available by request.

**CMR Status:** None.

### --REGULATORY LISTS SEARCHED--

1 = IARC 1  
2 = IARC 2A

3 = IARC 2B  
4 = ACGIH ALL

5 = ACGIH A1  
6 = ACGIH A2

## SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

### ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

### MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

### PERSISTENCE AND DEGRADABILITY

#### Biodegradation:

Base oil component -- Expected to be inherently biodegradable

### BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

## SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

### DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

### REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

**SECTION 14 TRANSPORT INFORMATION**

**LAND (TDG):** Not Regulated for Land Transport

**LAND (DOT):** Not Regulated for Land Transport

**SEA (IMDG):** Not Regulated for Sea Transport according to IMDG-Code

**AIR (IATA):** Not Regulated for Air Transport

**SECTION 15 REGULATORY INFORMATION**

**WHMIS Classification:** Not controlled

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**NATIONAL CHEMICAL INVENTORY LISTING:** AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

**The Following Ingredients are Cited on the Lists Below:** None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4  
2 = TSCA 5a2

3 = TSCA 5e  
4 = TSCA 6

5 = TSCA 12b  
6 = NPRI

**SECTION 16 OTHER INFORMATION**

N/D = Not determined, N/A = Not applicable



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**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:

Section 04: First Aid Eye - Header was modified.  
Section 04: First Aid Ingestion - Header was modified.  
Section 06: Notification Procedures - Header was modified.  
Section 11: Acute Toxicity Table Header was modified.  
Section 09: Colour was modified.  
Section 11: Inhalation - Header was modified.  
Section 09: Evaporation Rate - Header was modified.  
Section 09: Vapour Pressure - Header was modified.  
Section 07: Handling and Storage-Handling was modified.  
Section 07: Handling and Storage-Storage Phrases was modified.  
Section 11: Inhalation Lethality Test Data was modified.  
Section 05: Hazardous Combustion Products was modified.  
Section 09 Viscosity was modified.  
Section 14: Sea (IMDG) - Header was modified.  
Section 14: Air (IATA) - Header was modified.  
Section 14: LAND (TDG) - Header was modified.  
Section 14: LAND (DOT) - Header was modified.  
Section 14: LAND (DOT) - Default was modified.  
Section 14: LAND (TDG) Default was modified.  
Section 14: Sea (IMDG) - Default was modified.  
Section 14: Air (IATA) - Default was modified.  
Section 15: National Chemical Inventory Listing - Header was modified.  
Section 15: National Chemical Inventory Listing was modified.  
Hazard Identification: Hazards Note was modified.  
Section 16: CA Prepared by - Header was modified.  
Section 09: Oxidizing Properties was modified.  
Section 15: List Citation Table - Header was modified.  
Section 13: Regulatory Disposal Information - Header was modified.  
Section 15: Canadian List Citations Table was deleted.  
Section 15: Chemical Name - Header was deleted.  
Section 15: CAS Number - Header was deleted.  
Section 15: List Citations -Header was deleted.

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WHMIS Classification: Not controlled

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Prepared by: Imperial Oil Limited, IH and Product Safety

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** (see Section 16 for Synonyms) **TURBINE FUEL AVIATION, WIDE CUT TYPE**  
**Product Description:** Hydrocarbons and Additives  
**MSDS Number:** 8524

**Intended Use:** Aviation fuel

### COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
 240 4th Avenue  
 Calgary, ALBERTA. T2P 3M9 Canada  
**24 Hour Environmental / Health Emergency Telephone** 1-866-232-9563  
**Transportation Emergency Phone Number** 1-866-232-9563  
**Product Technical Information** 1-800-268-3183  
**Supplier General Contact** 1-800-567-3776

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

### Reportable Hazardous Substance(s) or Complex Substance(s)

| Name  | CAS#       | Concentration* | Acute Toxicity  |
|---|------------|----------------|---|
| 2-(2-METHOXYETHOXY)-ETHANOL                 | 111-77-3   | 0 - 0.15%      | Dermal Lethality: LD50 > 2.0 g/kg (Rabbit); Oral Lethality: LD50 7.0 g/kg (Rat) |
| FULL RANGE STRAIGHT RUN NAPHTHA (PETROLEUM) | 64741-42-0 | 30 - 60%       | None  |
| KEROSENE                                    | 8008-20-6  | 40 - 70%       | None  |

### Hazardous Constituent(s) Contained in Complex Substance(s)

| Name        | CAS#     | Concentration* | Acute Toxicity  |
|-------------|----------|----------------|---|
| BENZENE     | 71-43-2  | 0 - 1%         | Dermal Lethality: LD50 > 9.4 g/kg (Rabbit); Inhalation Lethality: LC50 43.7 mg/l (Rat); Oral Lethality: LD50 > 2000 mg/kg (Rat) |
| n-Hexane    | 110-54-3 | 0 - 3%         | Dermal Lethality: LD50 > 2000 mg/kg (Rabbit); Inhalation Lethality: LC50 > 17.6 mg/l (Rat)                                      |
| NAPHTHALENE | 91-20-3  | 0 - 0.15%      | Dermal Lethality: LD50 > 2500 mg/kg (Rat); Inhalation Lethality: LC50 > 0.4 mg/l (Rat); Oral Lethality: LD50 622 mg/kg (Mouse)  |

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

### PHYSICAL/CHEMICAL EFFECTS

FLAMMABLE. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

### HEALTH EFFECTS

Irritating to skin. May cause harm to the unborn child. If swallowed, may be aspirated and cause lung damage. May cause central nervous system depression. May be irritating to the eyes, nose, throat, and lungs. Breathing of high vapour concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. High-pressure injection under skin may cause serious damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anaemia and to the later development of acute myelogenous leukaemia (AML).

|                        |           |                 |               |
|------------------------|-----------|-----------------|---------------|
| <b>NFPA Hazard ID:</b> | Health: 2 | Flammability: 3 | Reactivity: 0 |
| <b>HMIS Hazard ID:</b> | Health: 2 | Flammability: 3 | Reactivity: 0 |

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

## SECTION 4 FIRST AID MEASURES

### INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

### SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

### EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

### INGESTION

Seek immediate medical attention. Do not induce vomiting.

### NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

### PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Contains benzene; individuals with pre-existing liver disease may be more susceptible to toxic effects.  
Contains hydrocarbon solvent/petroleum hydrocarbons; skin contact may aggravate an existing dermatitis.

## SECTION 5 FIRE FIGHTING MEASURES

## EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

## FIRE FIGHTING

**Fire Fighting Instructions:** Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Extremely Flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

## FLAMMABILITY PROPERTIES

**Flash Point [Method]:** -18°C (0°F) [ASTM D-93]

**Flammable Limits (Approximate volume % in air):** LEL: 0.6 UEL: 8.0

**Autoignition Temperature:** N/D

## SECTION 6

## ACCIDENTAL RELEASE MEASURES

### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

### SPILL MANAGEMENT

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface.

Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

### ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

|                  |                             |
|------------------|-----------------------------|
| <b>SECTION 7</b> | <b>HANDLING AND STORAGE</b> |
|------------------|-----------------------------|

#### HANDLING

Avoid contact with skin. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Do not siphon by mouth. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put petrol into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapour and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

**Static Accumulator:** This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

#### STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

|                  |  |
|------------------|--|
| <b>SECTION 8</b> | <b>EXPOSURE CONTROLS / PERSONAL PROTECTION</b> |
|------------------|--|

| Substance Name | Form               | Limit/Standard  | Note | Source   |
|----------------|--------------------|-----------------|------|----------|
| BENZENE        |                    | STEL<br>2.5 ppm | Skin | ACGIH    |
| BENZENE        |                    | TWA<br>0.5 ppm  | Skin | ACGIH    |
| KEROSENE       | Stable<br>Aerosol. | TWA<br>5 mg/m3  |      | Supplier |

|                                       |             |      |           |  |      |          |
|---------------------------------------|-------------|------|-----------|--|------|----------|
| KEROSENE                              | Vapour.     | TWA  | 200 mg/m3 |  |      | Supplier |
| KEROSENE [as total hydrocarbon vapor] | Non-Aerosol | TWA  | 200 mg/m3 |  | Skin | ACGIH    |
| n-Hexane                              |             | TWA  | 50 ppm    |  | Skin | ACGIH    |
| NAPHTHALENE                           |             | STEL | 15 ppm    |  | Skin | ACGIH    |
| NAPHTHALENE                           |             | TWA  | 10 ppm    |  | Skin | ACGIH    |

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

## ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical / oil resistant clothing if contact with material is likely.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

|                  |   |
|------------------|---|
| <b>SECTION 9</b> | <b>PHYSICAL AND CHEMICAL PROPERTIES</b> |
|------------------|---|

**Note:** Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

**GENERAL INFORMATION**

**Physical State:** Liquid  
**Colour:** Pale Yellow  
**Odour:** Petroleum/Solvent  
**Odour Threshold:** N/D

**IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION**

**Relative Density (at 15 °C):** 0.78  
**Flash Point [Method]:** -18°C (0°F) [ASTM D-93]  
**Flammable Limits (Approximate volume % in air):** LEL: 0.6 UEL: 8.0  
**Autoignition Temperature:** N/D  
**Boiling Point / Range:** 40°C (104°F) - 270°C (518°F)  
**Vapour Density (Air = 1):** 4 at 101 kPa  
**Vapour Pressure:** [N/D at 20°C] | 21 kPa (157.5 mm Hg) at 38°C  
**Evaporation Rate (n-butyl acetate = 1):** N/D  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** > 3.5  
**Solubility in Water:** Negligible  
**Viscosity:** 0.6 cSt (0.6 mm<sup>2</sup>/sec) at 40°C  
**Oxidizing Properties:** See Hazards Identification Section.

**OTHER INFORMATION**

**Freezing Point:** N/D  
**Melting Point:** N/A  
**Pour Point:** -58°C (-72°F)

|                   |                                 |
|-------------------|---------------------------------|
| <b>SECTION 10</b> | <b>STABILITY AND REACTIVITY</b> |
|-------------------|---------------------------------|

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Avoid heat, sparks, open flames and other ignition sources.

**MATERIALS TO AVOID:** Halogens, Strong Acids, Alkalies, Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

|                   |                                  |
|-------------------|----------------------------------|
| <b>SECTION 11</b> | <b>TOXICOLOGICAL INFORMATION</b> |
|-------------------|----------------------------------|

**ACUTE TOXICITY**

| <u>Route of Exposure</u> | <u>Conclusion / Remarks</u> |
|--------------------------|-----------------------------|
| Inhalation               |                             |



|   |   |
|---|---|
| Toxicity (Rat): LC50 > 5000 mg/m <sup>3</sup> | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation: No end point data for material.   | Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components. |
| <b>Ingestion</b>                              |   |
| Toxicity (Rat): LD50 > 2000 mg/kg             | Minimally Toxic. Based on test data for structurally similar materials.   |
| <b>Skin</b>                                   |   |
| Toxicity (Rabbit): LD50 > 2000 mg/kg          | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation (Rabbit): Data available.          | Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials.   |
| <b>Eye</b>                                    |   |
| Irritation (Rabbit): Data available.          | May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.  |

## CHRONIC/OTHER EFFECTS

### For the product itself:

Vapour/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness and other central nervous system effects including death. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Jet fuel: Some jet fuels have potential in mice to suppress indicators of immune system functionality. The relevance of these effects to humans is uncertain.

### Contains:

**BENZENE:** Caused cancer (leukemia), damage to the blood-producing system, and serious blood disorders from prolonged, high exposure based on human epidemiology studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus in laboratory animal studies.

**DIETHYLENE GLYCOL MONOMETHYL ETHER:** Oral maternal exposure of animals resulted in teratogenicity. Dermal maternal exposure of animals resulted in slight toxicity to the fetus. **KEROSENE:** Carcinogenic in animal tests. Lifetime skin painting tests produced tumours, but the mechanism is due to repeated cycles of skin damage and restorative hyperplasia. This mechanism is considered unlikely in humans where such prolonged skin irritation would not be tolerated. Did not cause mutations in-vitro. Inhalation of vapours did not result in reproductive or developmental effects in laboratory animals. Inhalation of high concentrations in animals resulted in respiratory tract irritation, lung changes and some reduction in lung function. Non-sensitizing in animal tests. **NAPHTHALENE:** Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

**N-HEXANE:** Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown.

Additional information is available by request.

### CMR Status:

| Chemical Name | CAS Number | List Citations |
|---------------|------------|----------------|
| BENZENE       | 71-43-2    | 1, 4, 5        |
| KEROSENE      | 8008-20-6  | 4              |
| n-Hexane      | 110-54-3   | 4              |
| NAPHTHALENE   | 91-20-3    | 3, 4           |

--REGULATORY LISTS SEARCHED--

- |             |               |              |
|-------------|---------------|--------------|
| 1 = IARC 1  | 3 = IARC 2B   | 5 = ACGIH A1 |
| 2 = IARC 2A | 4 = ACGIH ALL | 6 = ACGIH A2 |

**SECTION 12 ECOLOGICAL INFORMATION**

The information given is based on data available for the material, the components of the material, and similar materials.

**ECOTOXICITY**

Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

**MOBILITY**

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

**PERSISTENCE AND DEGRADABILITY**

**Biodegradation:**

Majority of components -- Expected to be inherently biodegradable

**Atmospheric Oxidation:**

More volatile component -- Expected to degrade rapidly in air

**BIOACCUMULATION POTENTIAL**

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

**SECTION 13 DISPOSAL CONSIDERATIONS**

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

**DISPOSAL RECOMMENDATIONS**

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

## REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. **DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.**

## SECTION 14

## TRANSPORT INFORMATION

### LAND (TDG)

**Proper Shipping Name:** FUEL, AVIATION, TURBINE ENGINE  
**Hazard Class & Division:** 3  
**UN Number:** 1863  
**Packing Group:** II  
**Special Provisions:** 17

### LAND (DOT)

**Proper Shipping Name:** FUEL, AVIATION, TURBINE ENGINE  
**Hazard Class & Division:** 3  
**ID Number:** 1863  
**Packing Group:** II  
**ERG Number:** 128  
**Label(s):** 3  
**Transport Document Name:**

### SEA (IMDG)

**Proper Shipping Name:** FUEL, AVIATION, TURBINE ENGINE  
**Hazard Class & Division:** 3  
**EMS Number:** F-E, S-E  
**UN Number:** 1863  
**Packing Group:** II  
**Label(s):** 3  
**Transport Document Name:**

### AIR (IATA)

**Proper Shipping Name:** FUEL, AVIATION, TURBINE ENGINE  
**Hazard Class & Division:** 3  
**UN Number:** 1863  
**Packing Group:** II  
**Label(s) / Mark(s):** 3  
**Transport Document Name:**

## SECTION 15

## REGULATORY INFORMATION

**WHMIS Classification:** Class B, Division 2: Flammable Liquids Class D, Division 2, Subdivision A: Very Toxic Material Class D, Division 2, Subdivision B: Toxic Material

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**Complies with the following national/regional chemical inventory requirements:** AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

**The Following Ingredients are Cited on the Lists Below:**

| Chemical Name | CAS Number | List Citations |
|---------------|------------|----------------|
| BENZENE       | 71-43-2    | 6              |
| n-Hexane      | 110-54-3   | 6              |
| NAPHTHALENE   | 91-20-3    | 6              |

--REGULATORY LISTS SEARCHED--

1 = TSCA 4                      3 = TSCA 5e                      5 = TSCA 12b  
 2 = TSCA 5a2                  4 = TSCA 6                        6 = NPRI

|                   |                          |
|-------------------|--------------------------|
| <b>SECTION 16</b> | <b>OTHER INFORMATION</b> |
|-------------------|--------------------------|

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

- Revision Changes:  
 Section 06: Protective Measures was modified.  
 Section 09: Boiling Point C(F) was modified.  
 Section 09: Pour Point C(F) was modified.  
 Section 09: VAPOUR PRESSURE was modified.  
 Section 09: Vapour Pressure was modified.  
 Section 11: Inhalation Irritation Test Data was modified.  
 Section 09: Relative Density - Header was modified.  
 Section 09: Flash Point C(F) was modified.  
 Section 09 Viscosity was modified.  
 Section 15: National Chemical Inventory Listing was modified.  
 Composition: Component table was modified.  
 Composition: Component table was modified.  
 Section 08: Exposure Limits Table was modified.  
 Section 15: Canadian List Citations Table was modified.  
 Section 01: Company Contact Methods Sorted by Priority was modified.  
 Section 11: Tox List Cited Table was modified.

**SYNONYMS:** TURBINE FUEL AVIATION, WIDE CUT TYPE, ESSO TURBO FUEL B, ESSO JET B, JET B, TURBO FUEL B, TURBO FUEL B F40, TURBO FUEL B JP4, ESSO TURBO FUEL B (FSII), JET B (FSII), AVIATION TURBINE FUEL (JP4), CAN/CGSB-3.22 GRADE F40, ESSO JET B (FSII)

**PRECAUTIONARY LABEL TEXT:**

WHMIS Classification: Class B, Division 2: Flammable Liquids Class D, Division 2, Subdivision A: Very Toxic Material Class D, Division 2, Subdivision B: Toxic Material

### HEALTH HAZARDS

Irritating to skin. May cause harm to the unborn child. If swallowed, may be aspirated and cause lung damage. May cause central nervous system depression.

### PHYSICAL HAZARDS

FLAMMABLE. In use, may form flammable/explosive vapour-air mixture. Material can accumulate static charges which may cause an ignition.

### PRECAUTIONS

Avoid contact with skin. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Do not siphon by mouth. Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation.

### FIRST AID

**Eye:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Oral:** Seek immediate medical attention. Do not induce vomiting.

**Skin:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

### FIRE FIGHTING MEDIA

Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

### SPILL/LEAK

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Report spills as required to appropriate authorities. Seek the advice of a specialist before using dispersants.

### Use

Not intended or suitable for use in or around a household or dwelling.

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Prepared by: Imperial Oil Limited, IH and Product Safety

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** ANTIFREEZE/COOLANT  
**Product Description:** Glycol  
**MSDS Number:** 8512  
**Intended Use:** Antifreeze/coolant

### COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
240 4th Avenue  
Calgary, ALBERTA. T2P 3M9 Canada  
**24 Hour Environmental / Health Emergency** 1-866-232-9563  
**Telephone**  
**Transportation Emergency Phone Number** 1-866-232-9563  
**Product Technical Information** 1-800-268-3183  
**Supplier General Contact** 1-800-567-3776

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

### Reportable Hazardous Substance(s) or Complex Substance(s)

| Name            | CAS#     | Concentration* | Acute Toxicity   |
|-----------------|----------|----------------|--|
| ETHYLENE GLYCOL | 107-21-1 | 90 - 99%       | Dermal Lethality: LD50 9.53 g/kg (Rabbit); Inhalation Lethality: LC50 4300 ppm (Rat); Oral Lethality: LD50 4.70 g/kg (Rat) |

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

### HEALTH EFFECTS

May cause harm to the unborn child. Harmful or fatal if swallowed. Ingestion may cause serious adverse effects and may be fatal. May cause kidney failure and central nervous system effects. Prolonged exposure to elevated concentrations of mist or liquid may cause irritation of the skin, eyes, and respiratory tract. High-pressure injection under skin may cause serious damage.

**NFPA Hazard ID:** Health: 1 Flammability: 1 Reactivity: 0  
**HMIS Hazard ID:** Health: 2\* Flammability: 1 Reactivity: 0

**NOTE:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

## SECTION 4 FIRST AID MEASURES

### INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

### SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

### EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

### INGESTION

Seek immediate medical attention.

### NOTE TO PHYSICIAN

This product contains ethylene glycol and/or diethylene glycol which, if ingested, are metabolized to toxic metabolites by the enzyme alcohol dehydrogenase, for which ethanol and 4-methylpyrazole {U.S. drug name Fomepizole, trade name Antizol} are antagonists. Administration of oral or intravenous ethanol or intravenous 4-methylpyrazole may arrest further metabolism of this material and thereby ameliorate the toxicity. Use of ethanol or 4-methylpyrazole does not affect toxic metabolites that are already present and is not a substitute for hemodialysis.

## SECTION 5 FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, alcohol-resistant foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water or standard foam

### FIRE FIGHTING

**Fire Fighting Instructions:** Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** Hazardous material. Firefighters should consider protective equipment indicated in Section 8.



**Hazardous Combustion Products:** Smoke, Fume, Aldehydes, Incomplete combustion products, Oxides of carbon

#### FLAMMABILITY PROPERTIES

**Flash Point [Method]:** 116°C (240°F) [ASTM D-92]

**Flammable Limits (Approximate volume % in air):** LEL: 3.2 UEL: 15

**Autoignition Temperature:** 400°C (752°F)

### SECTION 6 ACCIDENTAL RELEASE MEASURES

#### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

#### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

#### SPILL MANAGEMENT

**Land Spill:** Stop leak if you can do so without risk. Do not touch or walk through spilled material. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Recover by pumping or with suitable absorbent.

**Water Spill:** Stop leak if you can do so without risk. Consult an expert. Warn other shipping. Material will sink. Remove material, as much as possible, using mechanical equipment.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

#### ENVIRONMENTAL PRECAUTIONS

Remove debris in path of spill and remove contaminated debris from shoreline and water surface. Dispose of according to local regulations. Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

### SECTION 7 HANDLING AND STORAGE

#### HANDLING

Avoid breathing mists or vapour. Avoid contact with skin. Prevent small spills and leakage to avoid slip hazard.

**Static Accumulator:** This material is not a static accumulator.

#### STORAGE

Do not store in open or unlabelled containers.

### SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

| Substance Name  | Form     | Limit/Standard |                       | Note | Source |
|-----------------|----------|----------------|-----------------------|------|--------|
| ETHYLENE GLYCOL | Aerosol. | Ceiling        | 100 mg/m <sup>3</sup> |      | ACGIH  |

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

## ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

## PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If prolonged or repeated contact is likely, chemical-resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and

soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

|                  |   |
|------------------|---|
| <b>SECTION 9</b> | <b>PHYSICAL AND CHEMICAL PROPERTIES</b> |
|------------------|---|

**Note:** Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

**GENERAL INFORMATION**

**Physical State:** Liquid  
**Colour:** Colourless  
**Odour:** Characteristic  
**Odour Threshold:** N/D

**IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION**

**Relative Density:** > 1  
**Flash Point [Method]:** 116°C (240°F) [ASTM D-92]  
**Flammable Limits (Approximate volume % in air):** LEL: 3.2 UEL: 15  
**Autoignition Temperature:** 400°C (752°F)  
**Boiling Point / Range:** N/A  
**Vapour Density (Air = 1):** 2.1 at 101 kPa  
**Vapour Pressure:** 0.008 kPa (0.06 mm Hg) at 20°C  
**Evaporation Rate (n-butyl acetate = 1):** 0.01  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** < 2  
**Solubility in Water:** Complete  
**Viscosity:** [N/D at 40°C]  
**Oxidizing Properties:** See Hazards Identification Section.

**OTHER INFORMATION**

**Freezing Point:** N/D  
**Melting Point:** N/D  
**Pour Point:** -13°C (9°F)

|                   |                                 |
|-------------------|---------------------------------|
| <b>SECTION 10</b> | <b>STABILITY AND REACTIVITY</b> |
|-------------------|---------------------------------|

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Excessive heat. High energy sources of ignition.

**MATERIALS TO AVOID:** Strong oxidizers, Acids, Alkalies

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

|                   |                                  |
|-------------------|----------------------------------|
| <b>SECTION 11</b> | <b>TOXICOLOGICAL INFORMATION</b> |
|-------------------|----------------------------------|

**ACUTE TOXICITY**

| Route of Exposure                 | Conclusion / Remarks   |
|-----------------------------------|--|
| Inhalation                        |  |
| Toxicity (Rat): LC50 > 5000 mg/m3 | Minimally Toxic. Based on test data for structurally similar |

|                                      |   |
|--------------------------------------|---|
|                                      | materials.  |
| Irritation: Data available.          | Negligible hazard at ambient/normal handling temperatures. Based on test data for structurally similar materials. |
| <b>Ingestion</b>                     |   |
| Toxicity (Human): LDLo 100 ml        | Moderately toxic. Based on test data for structurally similar materials.  |
| <b>Skin</b>                          |   |
| Toxicity (Rabbit): LD50 > 2000 mg/kg | Minimally Toxic. Based on test data for structurally similar materials.   |
| Irritation (Rabbit): Data available. | Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.     |
| <b>Eye</b>                           |   |
| Irritation (Rabbit): Data available. | May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.          |

**CHRONIC/OTHER EFFECTS**

**Contains:**

ETHYLENE GLYCOL (EG): Repeated high oral exposure has caused kidney damage, neurological effects, degeneration of the liver and changes in blood chemistry and circulating blood cells in laboratory animals. Repeated overexposure has the potential to cause similar toxic effects in humans. EG causes developmental and reproductive effects at high dose levels in laboratory animals. The relevance of these findings to humans is uncertain. However, as a precaution, avoid exposure during pregnancy.

Additional information is available by request.

**CMR Status:** None.

| Chemical Name   | CAS Number | List Citations |
|-----------------|------------|----------------|
| ETHYLENE GLYCOL | 107-21-1   | 4              |

--REGULATORY LISTS SEARCHED--

- |             |               |              |
|-------------|---------------|--------------|
| 1 = IARC 1  | 3 = IARC 2B   | 5 = ACGIH A1 |
| 2 = IARC 2A | 4 = ACGIH ALL | 6 = ACGIH A2 |

**SECTION 12 ECOLOGICAL INFORMATION**

The information given is based on data available for the material, the components of the material, and similar materials.

**ECOTOXICITY**

Material -- Not expected to be harmful to aquatic organisms.

**MOBILITY**

Material -- Expected to remain in water or migrate through soil.

**PERSISTENCE AND DEGRADABILITY**

**Biodegradation:**

Material -- Expected to be readily biodegradable.

**Atmospheric Oxidation:**

Material -- Expected to degrade rapidly in air

#### BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

### SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

#### DISPOSAL RECOMMENDATIONS

Even though this product is readily biodegradable, it must not be indiscriminately discarded into the environment. Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

#### REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

### SECTION 14 TRANSPORT INFORMATION

**LAND (TDG):** Not Regulated for Land Transport

#### LAND (DOT)

**Proper Shipping Name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Ethylene Glycol )

**Hazard Class & Division:** 9

**ID Number:** 3082

**Packing Group:** III

**Product RQ:** 5102.04 LBS - ETHYLENE GLYCOL

**ERG Number:** 171

**Label(s):** 9

**Transport Document Name:** UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Ethylene Glycol), 9, PG III, RQ

**SEA (IMDG):** Not Regulated for Sea Transport according to IMDG-Code

**AIR (IATA):** Not Regulated for Air Transport

### SECTION 15 REGULATORY INFORMATION

**WHMIS Classification:** Class D, Division 1, Subdivision B: Toxic Material Class D, Division 2, Subdivision A: Very Toxic Material

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**Complies with the following national/regional chemical inventory requirements:** TSCA, DSL

**The Following Ingredients are Cited on the Lists Below:**

| Chemical Name   | CAS Number | List Citations |
|-----------------|------------|----------------|
| ETHYLENE GLYCOL | 107-21-1   | 6              |

--REGULATORY LISTS SEARCHED--

1 = TSCA 4  
 2 = TSCA 5a2

3 = TSCA 5e  
 4 = TSCA 6

5 = TSCA 12b  
 6 = NPRI

| SECTION 16 | OTHER INFORMATION |
|------------|-------------------|
|------------|-------------------|

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

Revision Changes:

- Section 04: First Aid Skin was modified.
- Section 04: First Aid Skin - Header was modified.
- Section 04: First Aid Eye - Header was modified.
- Section 04: First Aid Ingestion - Header was modified.
- Section 06: Protective Measures was modified.
- Section 06: Notification Procedures - Header was modified.
- Section 10: Materials To Avoid - Header was modified.
- Section 11: Acute Toxicity Table Header was modified.
- Section 09: Phys/Chem Properties Note was modified.
- Section 11: Inhalation - Header was modified.
- Section 09: Evaporation Rate - Header was modified.
- Section 08: Comply with applicable regulations phrase was modified.
- Section 09: Vapour Pressure - Header was modified.
- Section 09: Vapour Pressure was modified.
- Hazard Identification: Health Hazards was modified.
- Section 11: Inhalation Lethality Test Data was modified.
- Section 06: Accidental Release-Spill Management-Land was modified.
- Section 06: Accidental Release- Spill Management- Water was modified.
- Section 09: Flash Point C(F) was modified.
- Section 14: Sea (IMDG) - Header was modified.

Section 14: Air (IATA) - Header was modified.  
Section 14: LAND (TDG) - Header was modified.  
Section 14: LAND (TDG) Default was modified.  
Section 14: Sea (IMDG) - Default was modified.  
Section 14: Air (IATA) - Default was modified.  
Section 15: National Chemical Inventory Listing - Header was modified.  
Section 15: National Chemical Inventory Listing was modified.  
Hazard Identification: Hazards Note was modified.  
Hazard Identification: Health Hazards was modified.  
Section 15: WHMIS Classification was modified.  
Composition: Component table was modified.  
Section 16: Health Hazards was modified.  
Section 16: Health Hazards - Header was modified.  
Section 16: CA Prepared by - Header was modified.  
Section 09: Flammable Limits -UEL was modified.  
Section 08: Exposure Limits Table was modified.  
Section 16: Land Spill was modified.  
Section 16: First Aid Inhalation - Header was modified.  
Section 16: First Aid Skin was modified.  
Section 16: Precautionary Label Text - Header was modified.  
Section 09: Oxidizing Properties was modified.  
Section 01: Product Identification Product Name was modified.  
Section 01: Company Contact Methods Sorted by Priority was modified.  
Section 11: Tox List Cited Table was modified.  
Section 15: List Citation Table - Header was modified.  
Section 13: Regulatory Disposal Information - Header was modified.  
Section 14: Product RQ - Header was added.  
Section 14: Product RQ was added.  
Section 15: Canadian List Citations Table was added.  
Section 15: Chemical Name - Header was added.  
Section 15: CAS Number - Header was added.  
Section 15: List Citations -Header was added.

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#### **PRECAUTIONARY LABEL TEXT:**

WHMIS Classification: Class D, Division 1, Subdivision B: Toxic Material Class D, Division 2, Subdivision A: Very Toxic Material

#### **HEALTH HAZARDS**

May cause harm to the unborn child. Harmful or fatal if swallowed.

#### **PRECAUTIONS**

Avoid breathing mists or vapour. Avoid contact with skin.

#### **FIRST AID**

**Inhalation:** Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

**Eye:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Oral:** Seek immediate medical attention.

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**Skin:** Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

**SPILL/LEAK**

**Land Spill:** Stop leak if you can do so without risk. Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Recover by pumping or with suitable absorbent. Do not touch or walk through spilled material.

**Water Spill:** Stop leak if you can do so without risk. Report spills as required to appropriate authorities. Material will sink. This product emulsifies, disperses or is miscible in water. Consult an expert.

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Prepared by: Imperial Oil Limited, IH and Product Safety



**SECTION 1 – PRODUCT INFORMATION**

|                       |   |                               |   |
|-----------------------|---|-------------------------------|---|
| Product Name:         | Propane   | Supplier:                     | Superior Propane                                |
| Trade Name:           | LPG (Liquefied Petroleum Gas), LP-Gas                           |                               | A Division of Superior Plus LP                  |
| Chemical Formula:     | C <sub>3</sub> H <sub>8</sub>                                   |                               | 1111 - 49th Avenue N.E.                         |
| WHMIS Classification: | Class A – Compressed Gas<br>Class B, Division 1 – Flammable Gas |                               | Calgary, AB T2E 8V2<br>Business: (403) 730-7500 |
|                       |   | 24-Hour<br>Emergency Contact: | Canutec (613) 996-6666                          |

Application and Use: Propane is commonly used as a fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.

**SECTION 2 – HAZARDOUS INGREDIENTS**

| COMPONENTS                       | CAS No   | % VOLUME (v/v) | LD 50 (RAT, ORAL) |
|----------------------------------|----------|----------------|-------------------|
| Propane                          | 74-98-6  | 90% -99%       | Not Applicable    |
| Propylene                        | 115-07-1 | 0% - 5%        | Not Applicable    |
| Ethane                           | 74-84-0  | 0% - 5%        | Not Applicable    |
| Butane and heavier hydro carbons | 106-97-8 | 0% - 2.5%      | Not Applicable    |

Occupational Exposure Limit:

Based upon animal test data, the acute toxicity of this product is expected to be inhalation: 4 hour LC50 = 280,000 ppm (Rat)

Note: Composition is typical for HD-5 Propane per The Canadian General Standard Board CGSB 3.14 National Standard of Canada. Exact composition will vary from shipment to shipment.

**SECTION 3 – CHEMICAL AND PHYSICAL DATA**

|  |   |                       |   |
|--|---|-----------------------|---|
| Form:                                  | Liquid and vapour while stored under pressure | pH:                   | Not available   |
| Boiling Point:                         | -42°C @ 1 atm                                 | Solubility in Water : | Slight, 6.1% by volume @ 17.8°C   |
| Freezing Point:                        | -188°C  | Specific Gravity:     | 0.51 (water = 1)  |
| Evaporation Rate:                      | Rapid (Gas at normal ambient conditions)      | Appearance/Odour:     | Colourless liquid and vapour while stored under pressure. Colourless and odourless gas in natural state at any concentration. Commercial propane has an odourant added, ethyl mercaptan, which has an odour similar to boiling cabbage. |
| Vapour Pressure:                       | 1435 kPa (maximum) @ 37.8°C                   | Odour Threshold:      | 4800 ppm  |
| Vapour Density:                        | 1.52 (Air = 1)                                |                       |   |
| Coefficient of Water/Oil Distribution: | Not available                                 |                       |   |

With proper handling, transportation and storage, adding a chemical odourant such as ethyl mercaptan has proven to be a very effective warning device, but all odourants have certain limitations. The effectiveness of the odourant may be diminished by a person's sense of smell, by competing odours and by oxidation which may cause a potentially dangerous situation.

**SECTION 4 – FIRE OR EXPLOSION HAZARD**

|                                  |  |                                  |   |
|----------------------------------|--|----------------------------------|---|
| Flash Point:                     | -103.4°C   | Fire Extinguishing Precautions:  | Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fueling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent flame impingement and the weakening of metal. If sufficient water is not available to protect the container shell from weakening, the area will be required to be evacuated. If gas has not ignited, liquid or vapour may be dispersed by water spray or flooding. |
| Method:                          | Closed cup   | Special Fire Fighting Equipment: | Protective clothing, hose monitors, fog nozzles, self-contained breathing apparatus.  |
| Flammable Limits:                | Lower 2.4%, Upper 9.5%   |                                  |   |
| Auto Ignition Temperature:       | 432°C  |                                  |   |
| Hazardous Combustion Products:   | Carbon monoxide can be produced when primary air and secondary air are deficient while combustion is taking place. |                                  |   |
| Fire and Explosive Hazards :     | Explosive air -vapour allowed to leak to atmosphere.   |                                  |   |
| Sensitivity to Impact:           | No   |                                  |   |
| Sensitivity to Static Discharge: | Yes  |                                  |   |

**SECTION 5 – REACTIVITY DATA**

|                      |   |                                   |  |
|----------------------|---|-----------------------------------|--|
| Stability:           | Stable  | Hazardous Decomposition Products: | Deficient primary and secondary air can produce carbon monoxide. |
| Conditions To Avoid: | Keep separate from oxidizing agents. Gas explodes spontaneously when mixed with chloride dioxide. | Hazardous Polymerization:         | Will not occur.  |

Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks from combustible material, drains and openings to building.

## SECTION 6 – TOXICOLOGICAL PROPERTIES OF MATERIAL

Routes of Entry: Skin Contact, Eye Contact, Inhalation

Inhalation: Simple asphyxiant. No effect at concentrations of 10,000 ppm (peak exposures). Higher concentrations may cause central nervous system disorder and/or damage. Lack of oxygen may cause dizziness, loss of coordination, weakness, fatigue, euphoria, mental confusion, blurred vision, convulsions, breathing failure, coma and death. Breathing high vapour concentrations (saturated vapours) for a few minutes may be fatal. Saturated vapours may be encountered in confined spaces and/or under conditions of poor ventilation. Avoid breathing vapours or mist.

Skin and Eye Contact: Exposure to vapourizing liquid may cause frostbite (cold burns) and permanent eye damage.

Ingestion: Not considered to be a hazard.

Acute Exposure: Contact with Liquefied Petroleum Gas may cause frostbite or cold burns. Propane acts as a simple asphyxiant as oxygen content in air is displaced by the propane. At increasing concentration levels, propane may cause dizziness, headaches, loss of coordination, fatigue, unconsciousness and death.

Chronic Exposure: No reported effects from long term low level exposure.

Sensitization to Product: Not known to be a sensitizer.

Occupational Exposure Limits: American Conference of Governmental Industrial Hygienists (ACGIH) lists as a simple asphyxiant.

ACGIH TLV: 1000 ppm

Carcinogenicity, Reproductive Toxicity, Teratogenicity, Mutagenicity: No effects reported.

Other Toxicological Effects: None

## SECTION 7 – PREVENTATIVE MEASURES

Eyes: Safety glasses or chemical goggles are recommended when transferring product.

Skin: Insulated gloves required if contact with liquid or liquid cooled equipment is expected. Wear gloves and long sleeves when transferring product.

Inhalation: Where concentration in air would reduce the oxygen level below 18% air or exceed occupational exposure limits in section 6, self-contained breathing apparatus is required.

Ventilation: Use in well-ventilated areas. Use with explosion proof mechanical ventilation in confined spaces or poorly ventilated areas.

## SECTION 8 – EMERGENCY AND FIRST AID PROCEDURES

Eyes: Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Obtain immediate medical care.

Skin: In case of "Cold Burn" from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical care.

Ingestion: None considered necessary.

Inhalation: Remove person to fresh air. If breathing is difficult or has stopped, administer artificial respiration. Obtain immediate medical care.

Spill or Leak: Eliminate leak if possible. Eliminate source of ignition. Ensure cylinder is upright. Disperse vapours with hose streams using fog nozzles. Monitor low areas as propane is heavier than air and can settle into low areas. Remain upwind of leak. Keep people away. Prevent vapour and/or liquid from entering into sewers, basements or confined areas.

## SECTION 9 – TRANSPORTATION, HANDLING AND STORAGE

- Transport and store cylinders and tanks secured in an upright position in a ventilated space away from ignition sources (so the pressure relief valve is in contact with the vapour space of the cylinder or tank).
- Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap or guard.
- Do not store with oxidizing agents, oxygen, or chlorine cylinders.
- Empty cylinders and tanks may contain product residue. Do not pressurize, cut, heat or weld empty containers.
- Transport, handle and store according to applicable federal and provincial codes and regulations.

Transportation of Dangerous Goods (TDG)

TDG Classification: Flammable Gas 2.1

TDG Shipping Name: Liquefied Petroleum Gas (Propane)

PIN Number: UN1075

## SECTION 10 – PREPARATION INFORMATION

Prepared by: Superior Propane  
Health Safety and Environment Team

Telephone: (403) 730-7500  
Revision: January 17, 2011  
Supersedes: March 1, 2008

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