Kudlik Construction Ltd.
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SPILL CONTENGENCY PLAN

CAM-D DEW Line Environmental Remediation

SIMPSON LAKE, NUNAVUT

Presented to

Public Works and Government Services Canada

Review: September 2009

KUDLIK CONSTRUCTION LTD.
P.O. BOX 727, 1519 FEDERAL ROAD
IQALUIT, NUNAVUT

SPILL CONTENGENCY PLAN

CAM-D DEW Line Environmental Remediation

SIMPSON LAKE, NUNAVUT

Prepared by :

François Bourassa, P. Eng.
Project Manager
Kudlik Construction Ltd.

September 2009

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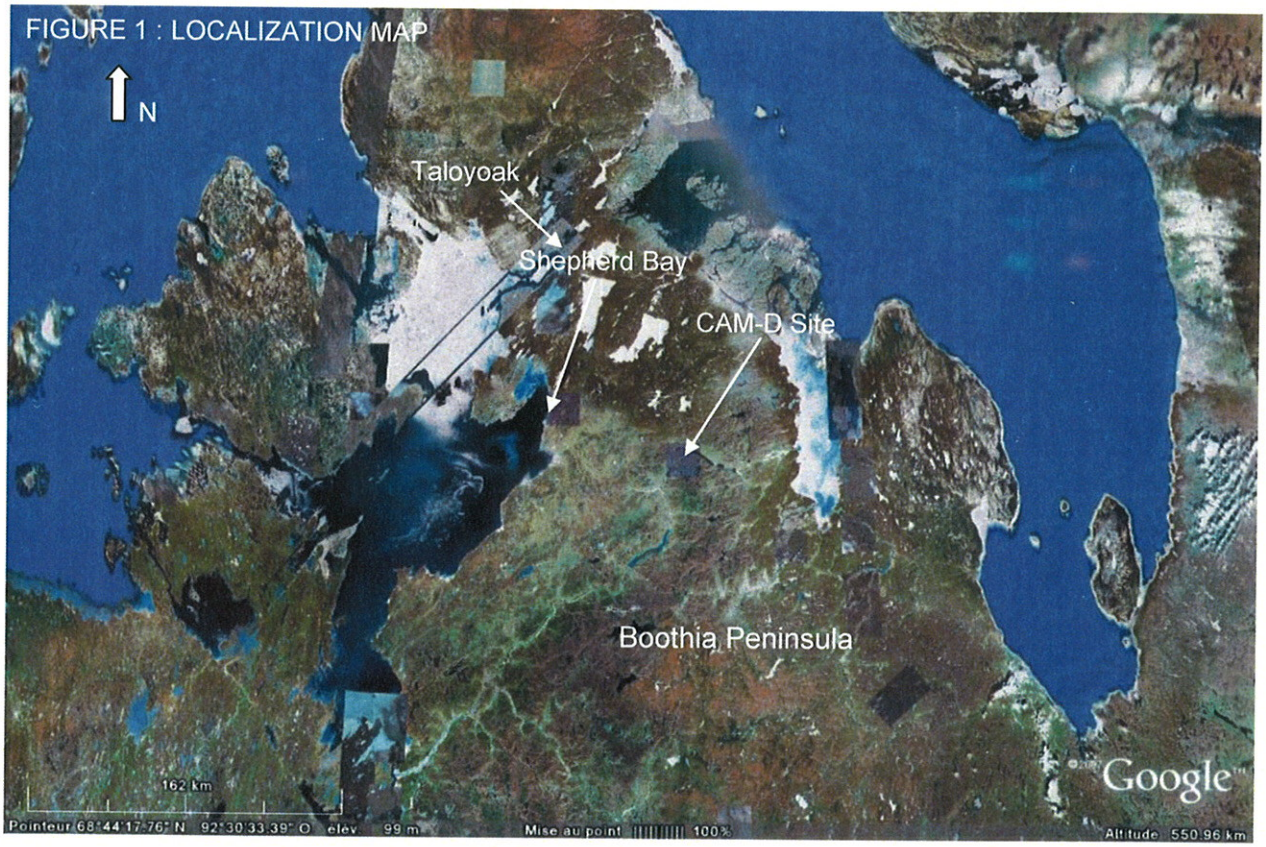
1. INTRODUCTION

The purpose of this document is to present the spill contingency plan for petroleum products elaborated for the remediation of the CAM-D DEW Line site. CAM-D is located in the middle of the Boothia Peninsula (Nunavut), approximately 4.5 km south of Simpson Lake and approximately 120 km southwest of Taloyoak (Spence Bay) in Nunavut.

The remediation project was awarded to Kudlik Construction Ltd. in December 2008. In August 2009, heavy equipments, camp facilities, material and all consumables were delivered by sealift to Shepherd Bay, located about 100 km northwest of CAM-D. Nearby the beach landing area, a camp was installed on INAC property in order to support further mobilization activities: All equipment, material and consumables required to achieve the remediation project at CAM-D must be transported by CAT train during the spring 2010 from Shepherd Bay to CAM-D.

This spill contingency plan is covering the storage and the manipulations of consumables (diesel, gasoline and lubricants) at Shepherd Bay, their transport and storage to CAM-D.



2. SHEPHERD BAY

2.1 STORAGE

The camp facility and the staging area were established on an INAC property located nearby the CAM-3 property limits, as indicated on figure 2. The following consumables are stored on site:

- Arctic Diesel: 600,240 litres stored in 2,928 drums
- Gasoline: 16,400 litres stored in 80 drums
- Engine oil 15W-40: 7,380 litres in 36 drums
- Transmission fluid 30: 1,230 litres in 6 drums
- Transmission fluid Dextron: 820 litres in 4 drums
- Hydraulic fluid 10W: 5,740 litres in 28 drums
- Gear oil 80W-90: 1,230 litres in 6 drums

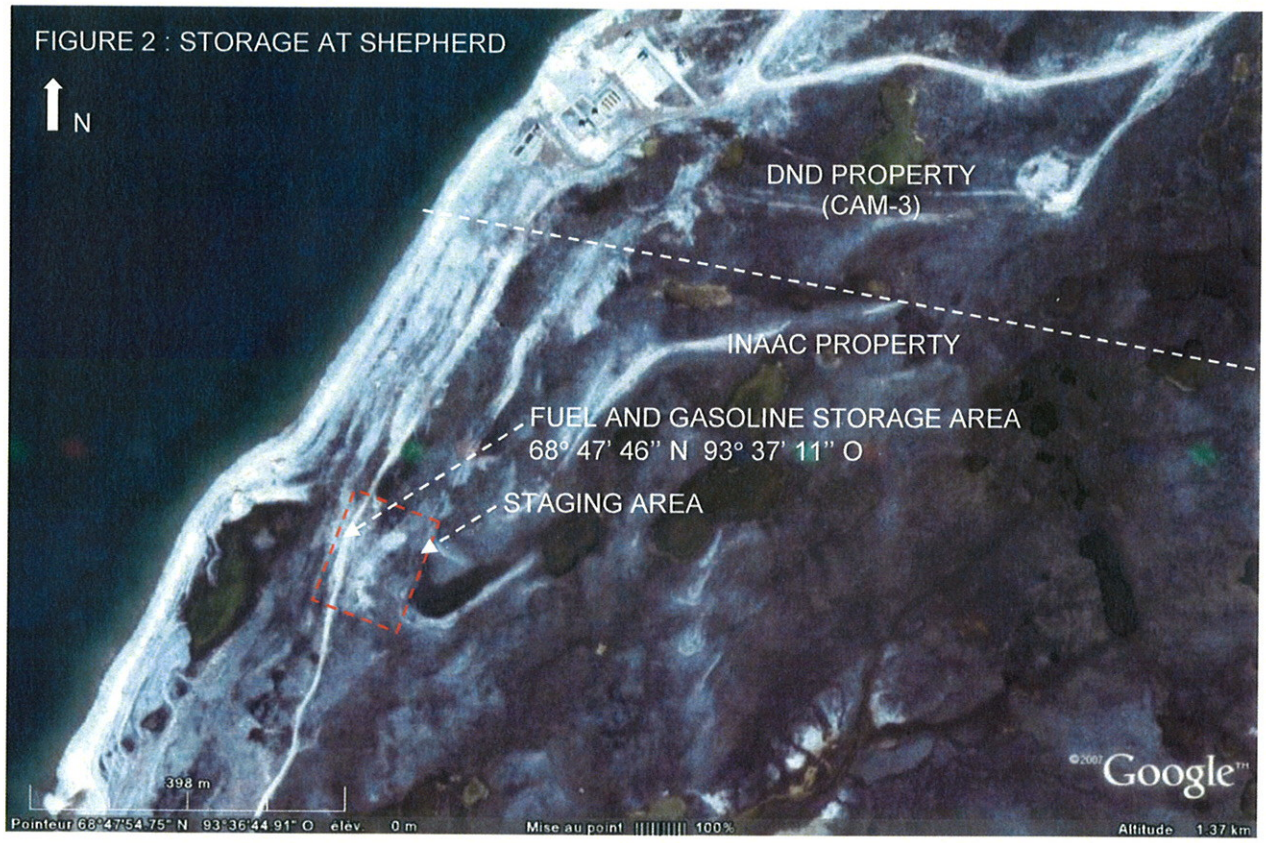
The arctic diesel is a blend of 95% of kerosene and 5% of ultra low sulphur diesel (ULSD). Two additives, Hitec 4858 and Hitec 4153, were added in order to increase the product performance in extreme cold temperatures. Material safety data sheets are presented in Appendix 1.

The diesel and gasoline storage area is located on a previously disturbed area covered with sand and gravel. No lakes or streams are located within 30 meters of this area. In accordance with the land use permit N2008X0004, no liner was installed on the drum storage area. However, as a precaution, a dyke was excavated around the area. All drums are identified as follow: Kudlik Construction, Shepherd Bay. All drums are strapped four by four on a wooden pallet. The pallets are stacked two rows high.

Regarding oils and lubricants, barrels are stored in four (4) 20ft marine containers identified as follow: 3277153, 2324464, 2242005 and 2088245.

The camp generator is connected to a 4,000 litres aboveground horizontal dyke tank (ULC-S653).

As explained in the followings sections, about 1400 diesel drums and 60 gasoline drums will be transported from Shepherd Bay to CAM-D during the spring 2010. The remaining barrels will be left in the storage area at Shepherd Bay in order to support some operations that will be carried during the spring 2011.



2.2 RESPONSE AND CLEANUP EQUIPMENT

Three (3) complete emergency spill kits are stored nearby the garage door at the camp facilities. Each kit is made of the following items and stored into three pre-identified 45 gallons steel drums:

- 5 Tyveck coveralls
- 10 pairs of disposable gloves
- 2 x 100 absorbent pad packs
- 1 x 20kg granular absorbent bag
- 4 x 2" diam. Floating absorbent booms
- 10 yellow storage bags
- One shovel

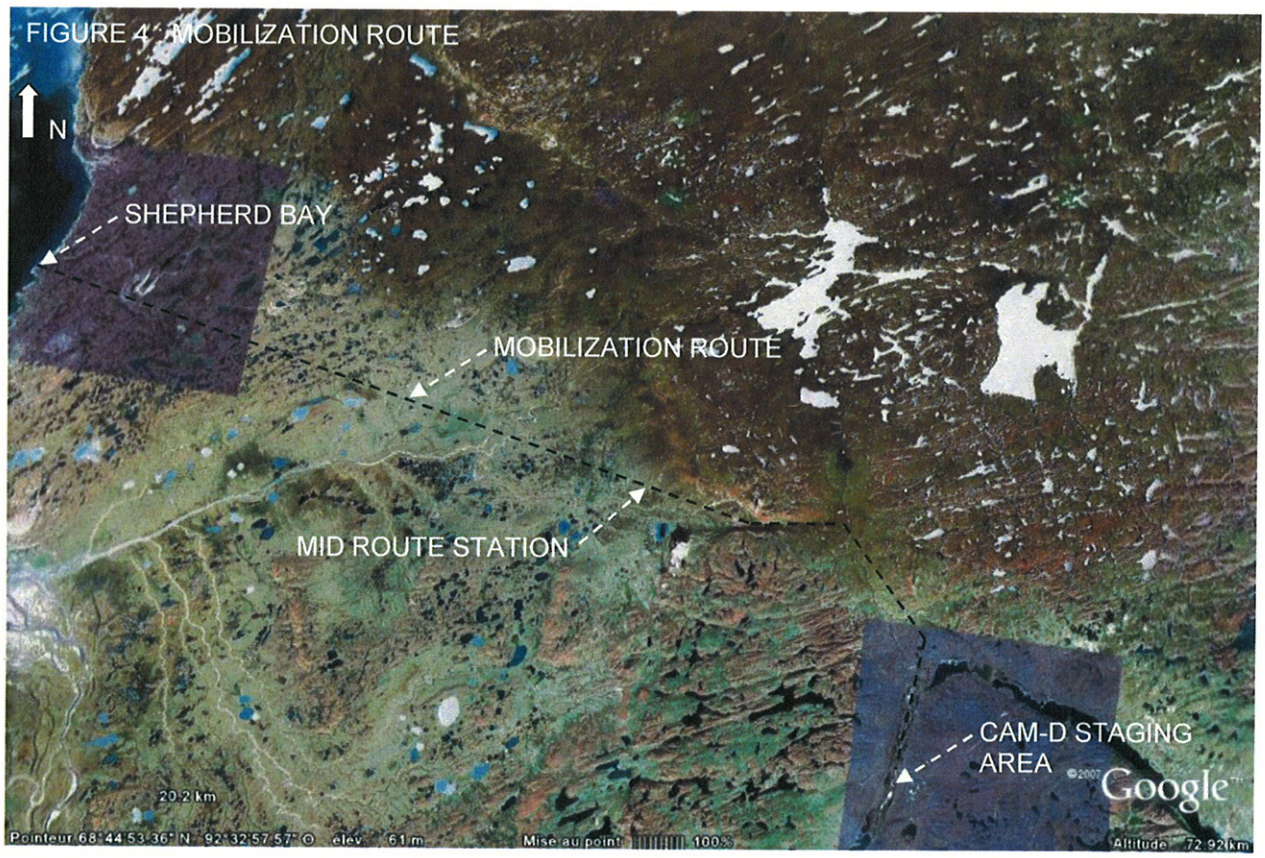
One (1) mobile tank mounted on an off road trailer is present on site. This tank has four (4) individual compartments, each having a capacity less than 4,000 litres. The total load capacity of the mobile tank is 18,000 litres. The tank is equipped with a vacuum pump and a suction pipe. It will be mainly used to pump out the diesel from each barrel in order to refuel the heavy equipments and vehicles during the mobilization and during the cleanup activities. The mobile tank is also part of our spill response equipment. In the event of a major spill, the mobile tank can be used to remove the liquid on the ground surface.

Fuel and gas electric pumps, hoses and fittings and portable generators are stored in the marine container #2047185. All environmental supplies for the entire cleanup project, including a large inventory of hydrocarbon absorbents and emergency spill material are stored in the marine container #2541623. These two containers will be transported from Shepherd Bay to CAM-D only at the end of the mobilization.

3. TRANSPORTATION

During the spring 2010, marine containers, camp facilities heavy equipments and consumables will be transported from Shepherd Bay to CAM-D. About 1,400 drums of arctic diesel and 60 drums of gasoline will be transported on sleighs pulled by tractors. The drums will unloaded and stored at CAM-D, as indicated in the following section. Each tractor is equipped with is own spill kit. Furthermore, sleighs loaded with diesel and gasoline barrels will be equipped with the following spill kit:

- 3 empty 45 gallons steel drums
- 5 Tyveck coveralls
- 10 pairs of disposable gloves
- 2 x 100 absorbent pads packs
- 1 x 20kg granular absorbent bag
- 4 x 2" diam. Floating absorbent boom
- 10 yellow storage bags
- One shovel
- One 12 volts diesel pump
- One gasoline manual pump



In order to refuel tractors during the mobilization, two (2) mobile tanks (IMO-1) installed on sleighs will be used. Both tanks have a maximum capacity of 23,000 litres. Each tanks is equipped with is own dispensing system. One will be parked temporary at CAM-D, nearby the staging area, and the other one will be parked temporary ad mid-route, as indicated on figure 4. Spill kits will be left beside each tank. It the event of a major spill, the third mobile tank described in the previous section will be used.

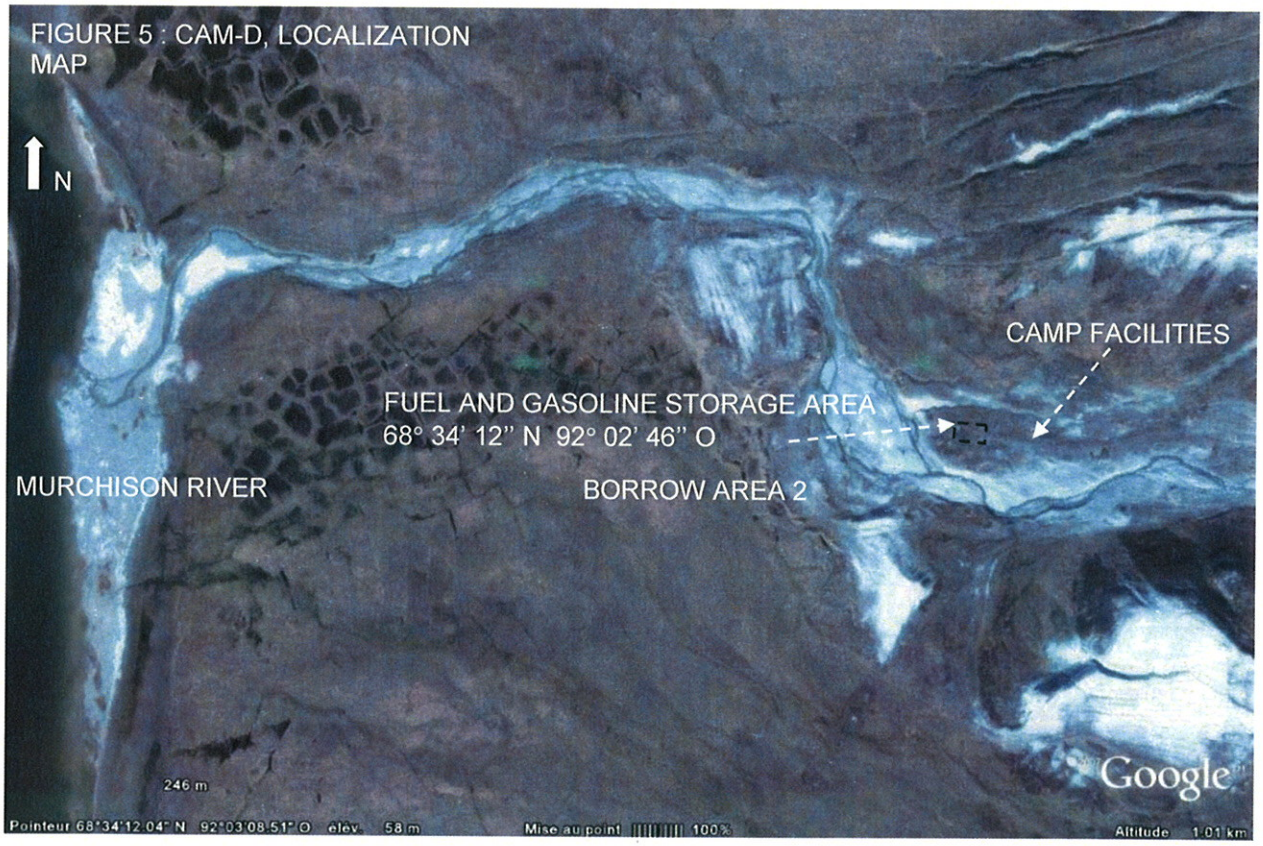
4. CAM-D

Since equipments, camp facilities and consumables are not yet mobilized at CAM-D, this section describes how we are planning to organize the site. An updated version will be issued once the site organization will have been completed.

4.1 STORAGE

The camp facilities and the storage area will be established on an INAC property located nearby the borrow area 2, as indicated on Figure 5. As mentioned previously, about 1400 drums of arctic diesel and 60 drums of gasoline will be stored in this area.

The camp generator will be connected to a 4,000 litres aboveground horizontal dyke tank (ULC-S653).



4.2 RESPONSE AND CLEANUP EQUIPMENT

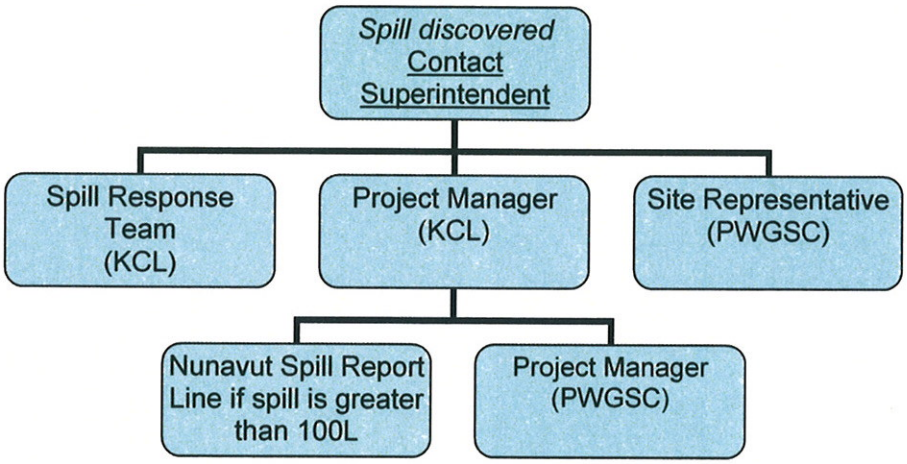
Since all equipment and material will be transported from Shepherd Bay to CAM-D, please refer to the section 2.2 for the description of the spill response equipment.

Please note that all heavy equipments, including three excavators, two loaders and four off road dump truck will be used at CAM-D. In the event of a major spill, heavy equipments will be used to contain de product and to remove the contaminated soils. Storage bags (super bags) having each one a capacity of one cubic meter can be used to store safely soils contaminated with hydrocarbons. Furthermore, a complete contaminated water treatment plant will be also available on site.

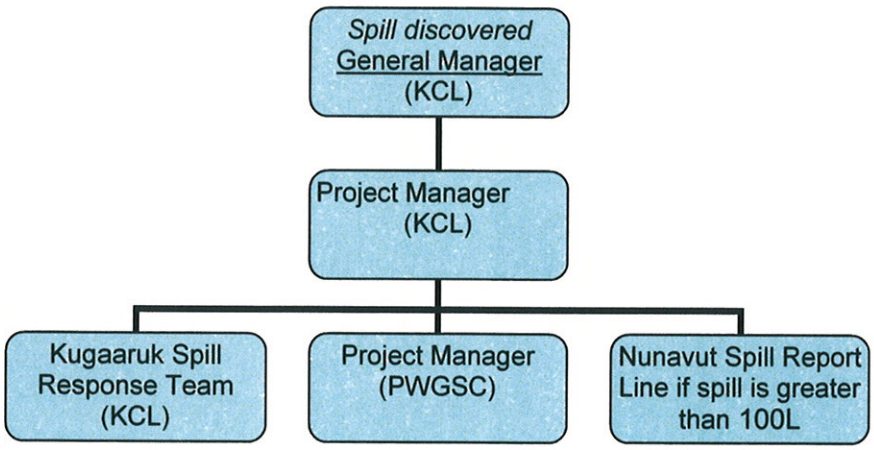
5. PROCEDURES IN CASE OF SPILL

5.1 LINE OF COMMUNICATION

No matter the size of the spill, it must be reported as soon as possible to the site superintendent. The following line of communication must be applied during the mobilization and site works:



During non-working periods, the following line of communication must be applied:



5.2 EMERGENCY PHONE NUMBERS

Kudlik Construction Ltd	Business hours	After hours
Main Office, Iqaluit	(867) 979-1166	
René Déziel, General Manager	(866) 781-0704	(418) 571-8889
François Bourassa, Project Manager	(866) 781-0704	
Staff house, Kugaaruk	(867) 769-7909	(867) 769-7909
Shepherd Bay camp	To be confirmed	
CAM-D camp	To be confirmed	
Satellite Phone #1 (irridium)	001-881-631-649-824	
Satellite Phone #2 (irridium)	001-881-631-649-825	
Satellite Phone #3 (Bgan)	To be confirmed	
PWGSC		
Matthew McElwaine, project manager	(780) 497-3690	(780) 918-6277
RCMP		
Kugaaruk	(867) 769-1111	
Environment		
Nunavut Spill Report Line	(867) 920-8130.	

5.3 GENERAL PROCEDURES

This general procedure is to be followed in the event of a spill. Steps are listed in the order of importance; however, depending on the circumstances, conditions, and potential injuries, this order may need to be altered to meet specific needs.

1. Identify the product spilled and call for help:

Petroleum products on site are arctic diesel, gasoline and lubricants. Advise as soon as possible the site superintendent and call for help when needed.

2. Assessment of dangers and hazards:

Immediate determinations must be made about the direction of the spill's progress, whether downhill, on the ice, towards the water, or already in the water. As well, careful attention will be paid to the full nature of the incident; is this solely a surface contaminant, or are fumes an additional factor; are there any injuries current or possible.

3. Stop the flow at source:

Has the flow been stopped or is it still leaking? Is there an emergency Shut-off valve? Have holes in the container been patched? Is the container empty? PRECAUTION: ONLY ATTEMPT TO STOP THE FLOW IF IT IS SAFE TO DO SO.

4. Take actions to contain the spill:

Prompt containment can reduce environmental exposure and risk. Containment measures may be land or water based. Land based measures include application of sorbents, construction of berms and diversion/collection trenches. Water based measures could include dams, dykes, and floating booms.

5.4 SPECIFIC PROCEDURES FOR DIFFERENT ENVIRONMENTS

The entire mobilization/demobilization will be done on snow or ice while the cleanup activities will be performed during summer. As explained in the following sections, procedures in case of spill vary depending in which environment it occurs.

5.4.1 Spill on land

- Do not flush into ditches or drainage systems.
- Block entry into waterways and contain with earth, snow or other barrier.
- Remove small spills with sorbent pads.
- On tundra use peat moss and leave in place to degrade, if practical.

5.4.2 Spill on ice and snow

- Block entry into waterways and contain with snow or other barrier.
- Remove minor spills with sorbent pads and/or snow.
- Use ice augers and pump to recover diesel under ice.
- Slots in ice can be cut over slow moving water to contain oil.
- Burn accumulated diesel from the surface using Tiger Torches if feasible and safe to do so.

5.4.3 Spill on Muskeg

- Do not deploy personnel and equipment on marsh or vegetation.
- Remove pooled diesel with pumps and skimmers.
- Flush with low pressure water to herd diesel to collection point.
- Burn only in localized areas, e.g., trenches, piles or windrows.
- Do not burn if root systems can be damaged (low water table).
- Minimize damage caused by equipment and excavation.

5.4.4 Spill in water

- Contain spill as close to release point as possible.
- Use spill containment boom to concentrate slicks for recovery.
- On small spills, use sorbent pads to pick up contained oil.
- On larger spills, use skimmer on contained slicks.
- Do not deploy personnel and equipment onto mudflats or into wetlands

5.4.5 Spill in rivers and streams

- Prevent entry into water, if possible, by building berm or trench.
- Intercept moving slicks in quiet areas using (sorbent) booms.
- Do not use sorbent booms/pads in fast currents and turbulent water.

5.5 REPORTING

All spills must be reported to Kudlik management and PWGSC. For every spill, the attached form "NWT Spill Report" must be filled. Pictures must be taken during and after the cleanup progress. The GPS coordinates of the spill location must be recorded. All information and pictures will be used for the spill report. Any spill grater than 100 litres must be reported the Nunavut 24-hours spill report line (see emergency phone number list). The person reporting the spill shall give as much of the following information as possible. Please note that the operators at the Hotline are NOT spill management experts. They can only relay information to the appropriate

authorities/protection agencies. Reportable information includes but is not limited to the following:

- Date and time of spill;
- Direction spill is moving (or if it has stopped);
- Name and phone number of persons close to the location of the spill;
- Type of contaminant spilled and quantity spilled;
- Cause of spill;
- Whether the spill is continuing or has stopped;
- Description of the existing containment;
- Actions taken to recover, clean-up and dispose of spilled contaminant;
- Name, address and phone number of person reporting the spill;
- Name of person in charge of management or control at time of spill;

6. TRAINING

All employees working on the CAM-D DEW Line Site Cleanup project, including contractors and sub-contractors will have to attempt the worker orientation seminar. Through this seminar, the spill contingency plan will be review and explained to everyone. The employees will be trained in the safe operation of all machinery and tools, as well as in the handling of materials to help prevent and respond to hazardous material spills in a timely and effective manner. Training will also include initial spill response in the event of a spill. The spill response team will be also determined and the member list will be posted.

SPILL CONTENGENCY PLAN

CAM-D DEW Line Environmental Remediation

SIMPSON LAKE, NUNAVUT

APPENDIX 1
MATERIAL AND SAFETY DATA SHEETS

Afton CHEMICAL

Material Safety Data Sheet

HiTEC 4103 Cetane Improver

MSDS No. H4103

1. Product and Company Identification

Product Use: Petrochemical industry: Diesel Fuel Additive

Validation Date: **27 July 2005**

In Case of Emergency

1-800-403-0044 (US & Canada)
1-804-648-7727 (International)
32-2-507-20-64 (Europe)
81-3-5210-4890 (Japan)

Manufacturer / Supplier

Afton Chemical Corporation
500 Spring St.
Richmond, VA 23219
1-804-788-5800

Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44 1344-304141

In Japan:
Afton Chemical Japan Corporation
Sumitomo Fudousan Sanbancho Bldg. 5F
6-26 Sanbancho, Chiyoda-ku
Tokyo 102-0075 Japan
Emergency phone: 81-3-5210-4890

In Australia:
Afton Chemical Asia Pacific Company
Level 9, 20 Berry Street
North Sydney, NSW 2060
Australia
Telephone number: 02-9923-1588
Business Hours: 9:00am - 5:00pm

2. Composition and Information on Ingredients

Note: See section 8 for occupational exposure limits and section 11 for LC50/LD50 information.

Substance/Preparation : Preparation

Ingredient Name	CAS No.	Conc. (% w/w)	EU Classification	WHMIS Regulated?
2-Ethylhexyl nitrate	27247-96-7	>99	R44 Xn; R20/21	Yes.

3. Hazards Identification

Notice to Reader

Afton operates a world-wide system for hazard communication. Some hazards shown in Section 3 may apply to non-EU countries and may not result in classification and labeling in the EU. Please see Section 2 and 15 for country specific classification information, and Section 11 for additional details.

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Primary Hazards and Critical Effects : WARNING!
COMBUSTIBLE LIQUID AND VAPOR.
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
ASPIRATION HAZARD IF SWALLOWED.

Physical/Chemical Hazards : When heated above 100°C/212°F may undergo a self-accelerating, exothermic reaction which causes a rapid rise in temperature and pressure. Rupture of storage vessels and fire should be anticipated in case of such temperature.
Combustible.

Environmental Hazards : Not classified as dangerous for the environment according to EC criteria.

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

Health	2
Fire Hazard	2
Reactivity	1

4. First Aid Measures

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : DO NOT induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. If affected person is fully conscious, give one glass of water to drink. Never give anything by mouth to an unconscious person. Get immediate medical attention.

Skin Contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately.

Eye Contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

5. Fire-Fighting Measures

Extinguishing Media : In case of fire, use water spray (fog), foam, dry chemical, or CO2.

Fire-Fighting Procedures : Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear. When heated above 100°C/212°F may undergo a self-accelerating, exothermic reaction which causes a rapid rise in temperature and pressure. Rupture of storage vessels and fire should be anticipated in case of such temperature.
Spray storage vessels with water to maintain temperature below 100°C/212°F.

Fire/Explosion Hazards : Combustible liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back.

Hazardous Decomposition Products : These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).

Flash point : Closed cup: 65°C (149°F).(Pensky-Martens. Minimum)

6. Accidental Release Measures

Personal Precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5). Do not touch or walk through spilled material.

Environmental Precautions and Clean-up Methods : If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterway

Note: See section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and Storage

Handling : Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. To avoid fire, minimize ignition sources.

Storage : Keep container in a well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).Keep container in a well-ventilated place.

8. Exposure Controls and Personal Protection

Engineering Controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protective Equipment

Respiratory System : Use appropriate respiratory protection if there is the potential to exceed the exposure limit(s). (Approved/certified respirator with organic vapor cartridges.)

Skin and Body : Where contact is likely, wear chemical resistant gloves, a chemical resistant suit, and boots. Additional body garments should be used based upon the task being performed.

Hands : Use chemical resistant, impervious gloves.

Eyes : Safety goggles are considered minimum protection. Goggles with a face shield may be necessary depending on quantity of material and conditions of use.

Occupational Exposure Limits

Ingredient Name	OEL United States	OEL Canada	OEL Europe	OEL Australia
2-Ethylhexyl Nitrate	**Afton (United States).** TWA: 1 ppm 8 hour(s).	**Afton (Canada).** TWA: 1 ppm 8 hour(s).	**Afton (Europe).** TWA: 1 ppm 8 hour(s).	**Afton (Australia).** TWA: 1 ppm 8 hour(s)

9. Physical and Chemical Properties

Physical State and Appearance : Liquid.
Color : Colorless to light yellow.
Odor : Fruity. Pungent. Ester. Characteristic.
Vapor Pressure : 0.2 mmHg at 20°C.
Specific Gravity : 0.96 at 20°C
Solubility : 12.6 mg/L @ 20°C (Solubility in water)
Viscosity : 1.8 cSt at 20°C (typical).
Auto-Ignition Temperature : 130°C (266°F)
Flash Point : Closed cup: 65°C (149°F).(Pensky-Martens. Minimum)

10. Stability and Reactivity

Stability : Unstable at temperatures greater than 100°C/212°F.
Materials to avoid : Strong oxidizing and reducing agents.
Conditions to avoid : Temperatures above 50°C/122°F-60°C/140°F, sparks, and open flames.

11. Toxicological Information

Routes of Entry : Absorbed through skin. Inhalation. Ingestion.
Target Organs : Contains material which may cause damage to the following organs: cardiovascular system.

Acute Effects

Inhalation : Harmful by inhalation. Overexposure to organic nitrates by inhalation of vapor or skin contact may cause headache, dizziness, nausea, and decreased blood pressure.
Ingestion : Aspiration hazard if swallowed- can enter lungs and cause damage. Does not meet EU R65 classification criteria.
Skin Contact : Harmful in contact with skin. Overexposure to organic nitrates by inhalation of vapor or skin contact may cause headache, dizziness, nausea, and decreased blood pressure.
Eye Contact : Non-irritating to the eyes.

Chronic Effects

Adverse Effects : None known.
Carcinogenic Effects : Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.

Toxicity Data

Ingredient Name	Test	Result	Route	Species
HiTEC 4103 Cetane Improver	LD50	>10000 mg/kg	Oral	Rat
	LD50	>5000 mg/kg	Dermal	Rabbit

Other Information : Not available.

12. Ecological Information

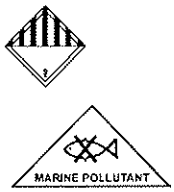
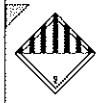
Environmental Hazards : Not classified as dangerous for the environment according to EC criteria. Based on test data for this or similar products.
Environmental Fate : This product contains components which may be persistent in the environment.

13. Disposal Consideration

Waste Handling and Disposal : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

Regulatory Information	UN number	Proper shipping name	Class	Packing Group	Label	Additional information
DOT Classification	NA1993	Combustible liquids, n.o.s. (2-ethylhexyl nitrate).	Combustible Liquid.	III		Remarks Marine pollutant
TDG Classification	UN3082	Environmentally hazardous substance, liquid, n.o.s. (2-ethylhexyl nitrate)	9	III		Not available.

ADR/RID Class	UN3082	Environmentally hazardous substance, liquid, n.o.s. (2-ethylhexyl nitrate)	9	III		Hazard Identification Number 90
IMDG Class	UN3082	Environmentally hazardous substance, liquid, n.o.s. (2-ethylhexyl nitrate)	9	III		Marine Pollutant
IATA-DGR Class	UN3082	Environmentally hazardous substance, liquid, n.o.s. (2-ethylhexyl nitrate)	9	III		-
ADG Class	UN3082	Environmentally hazardous substance, liquid, n.o.s. (2-ethylhexyl nitrate)	9	III		

Notice to Reader

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions.

15. Regulatory Information

EU Regulations

Hazard Symbol(s) : 

Harmful

Risk Phrases : R44- Risk of explosion if heated under confinement.
R20/21- Harmful by inhalation and in contact with skin.

Safety Phrases : S15- Keep away from heat.
S23- Do not breathe vapor.
S24/25- Avoid contact with skin and eyes.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.

Contains : 2-Ethylhexyl nitrate

Additional Warning Phrases : Not applicable.

US Regulations : No SARA 313 chemicals are present above the reporting threshold.

: SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Fire Hazard,Reactive, Immediate (Acute) Health Hazard

State : California prop. 65: No products were found.

Canadian Regulations

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

International Inventory Status

United States : All components on TSCA Inventory

Canada : All components on DSL

Europe : All components on EINECS

Japan : All components on METI

Australia : All components on NICNAS

Korea : All components on ECL

China : All components on IECSC

Philippines : All components on PICCS

16. Other Information

PREPARATION INFORMATION

Validated by _HS&E Department (Tel: +1 804 788 5800) on 7/27/2005.

Version : 1

Date of Printing : 7/27/2005.

☑ Indicates information that has changed from previously issued version.

Notice to Reader

This information and these recommendations are offered in good faith and believed to be correct as of the date hereof. Information and recommendations are supplied upon the condition that the recipients will make their own decision as to safety and suitability for their purposes. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature, are made with respect to the product or the information and recommendations. Afton makes no representation as to completeness or accuracy. In no event will Afton be responsible for damages of any nature whatsoever resulting from the use or reliance upon the information and recommendations.

ADDRESS CONTACT INFORMATION

In the United States and Canada:
Afton Chemical Corporation
500 Spring Street
Richmond, Virginia
USA 23219-2183
Telephone number: 804-788-5800

In Singapore:
Afton Chemical Asia Pacific Company
111 Somerset Road
#09-05
Singapore Power Building
Singapore 238164
Telephone number: 65-6732-0822

In Australia:
Afton Chemical Asia Pacific Company
Level 9, 20 Berry Street
North Sydney, NSW 2060
Australia
Telephone number: 02-9923-1588
Business Hours: 9:00am - 5:00pm

In Europe:
Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44-1344-304141

In Japan:
Afton Chemical Japan Corporation
Sumitomo Fudousan Sanbancho Bldg. 5F
6-26 Sanbancho, Chiyoda-ku
Tokyo 102-0075 Japan
Emergency phone: 81-3-5210-4890

*** END OF MSDS ***

Material Safety Data Sheet

HiTEC 4858 Fuel Additive

MSDS No. H4858

HiTEC is a trademark owned by Afton Chemical Corporation or one of its subsidiaries.

1. Product and Company Identification

Product Use: Petrochemical industry: Neutral Lubricity Additive.

Validation Date: **13 October 2006**

In Case of Emergency - Chemical

1-800-403-0044 (US & Canada)
1-804-648-7727 (International)
32-2-507-20-64 (Europe)
81-3-5210-4890 (Japan)

Manufacturer / Supplier

Afton Chemical Corporation
500 Spring St.
Richmond, VA 23219
1-804-788-5800

Afton Chemical Limited
Euro-Tech Centre
London Road, Bracknell, Berkshire
RG12 2UW, England
44 1344-304141

In Japan:
Afton Chemical Japan Corporation
Sumitomo Fudousan Sanbancho Bldg. 5F
6-26 Sanbancho, Chiyoda-ku
Tokyo 102-0075 Japan
Emergency phone: 81-3-5210-4890

In Australia:
Afton Chemical Asia Pacific Company
Level 9, 20 Berry Street
North Sydney, NSW 2060
Australia
Telephone number: 02-9923-1588
Business Hours: 9:00am - 5:00pm

2. Composition and Information on Ingredients

Note: See section 8 for occupational exposure limits and section 11 for LC50/LD50 information.

Substance/Preparation : Preparation

Ingredient name	CAS No.	Conc. (% w/w)	EU Classification	WHMIS Regulated?
Solvent naphtha (petroleum), light aromatic	64742-95-6	30 - 60	R10 Xn; R65 Xi; R37 R66, R67 N; R51/53	Yes.
Benzene, 1,2,4-trimethyl-	95-63-6	20 - 30	R10 Xn; R20 Xi; R36/37/38 N; R51/53	Yes.
Benzene, 1,3,5-trimethyl-	108-67-8	5 - 9.9	R10 Xi; R37 N; R51/53	Yes.
N-Propylbenzene	103-65-1	5 - 9.9	R10 Xn; R65 Xi; R37 N; R51/53	Yes.
Xylene	1330-20-7	1 - 4.9	R10 Xn; R20/21 Xi; R38	Yes.
Cumene	98-82-8	1 - 4.9	R10 Xn; R65 Xi; R37 N; R51/53	Yes.
Benzene, 1,2,3-trimethyl-	526-73-8	1 - 4.9	R10	Yes.
Ethylbenzene	100-41-4	0.1-0.5	F; R11 Xn; R20	Yes.

3. Hazards Identification

Notice to Reader

Afton operates a world-wide system for hazard communication. Some hazards shown in Section 3 may apply to non-EU countries and may not result in classification and labeling in the EU. Please see Section 2 and 15 for country specific classification information, and Section 11 for additional details.

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.
Classified as hazardous according to the criteria of NOHSC and classified as dangerous goods according to the ADG Code.

Primary Hazards and Critical Effects	:	WARNING! CAUSES RESPIRATORY TRACT IRRITATION. ASPIRATION HAZARD IF SWALLOWED.
Physical/Chemical Hazards	:	COMBUSTIBLE. - United States and Canada FLAMMABLE. - European Union VAPOR MAY CAUSE FLASH FIRE.
Environmental Hazards	:	Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

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

Health	1
Fire Hazard	2
Reactivity	0

4. First Aid Measures

Inhalation	:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	:	DO NOT induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. If affected person is fully conscious, give one glass of water to drink. Never give anything by mouth to an unconscious person. Get immediate medical attention.
Skin Contact	:	Wash with soap and water. Get medical attention if irritation develops.
Eye Contact	:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

5. Fire-Fighting Measures

Extinguishing Media	:	In case of fire, use water spray (fog), foam, dry chemical, or CO2.
Fire-Fighting Procedures	:	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.
Fire/Explosion Hazards	:	COMBUSTIBLE. - United States and Canada FLAMMABLE. - European Union VAPOR MAY CAUSE FLASH FIRE. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.
Hazardous Decomposition Products	:	These products are carbon oxides (CO, CO_2).
Flash point	:	Closed cup: 52°C (125.6°F). (Pensky-Martens. Minimum)

6. Accidental Release Measures

Personal Precautions	:	Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Follow all fire-fighting procedures (section 5). Do not touch or walk through spilled material.
Environmental Precautions and Clean-up Methods	:	If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways.

Note: See section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and Storage

Handling : Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Storage : Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. Exposure Controls and Personal Protection

Engineering Controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protective Equipment

Respiratory System : Use appropriate respiratory protection if there is the potential to exceed the exposure limit(s).

Skin and Body : Disposable outer garments when there is the potential for contact with the material.

Hands : Use chemical resistant, impervious gloves.

Eyes : Safety glasses with side shields. Goggles with a face shield may be necessary depending on quantity of material and conditions of use.

Occupational Exposure Limits

Ingredient Name	OEL United States	OEL Canada	OEL Europe	OEL Australia
1) Solvent naphtha (petroleum), light aromatic	**OSHA (United States).** TWA: 500 ppm 8 hour/hours.	**OSHA (United States).** TWA: 500 ppm 8 hour/hours.	**OSHA (United States).** TWA: 500 ppm 8 hour/hours.	
2) Benzene, 1,2,4-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	TWA: 25 ppm	**EH40 (UK) (Europe).** TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
3) Benzene, 1,3,5-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	TWA: 25 ppm	**EH40 (UK) (Europe).** TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
4) Xylene	**ACGIH (United States, 1996).** TWA: 100 ppm STEL: 150 ppm **OSHA (United States).** TWA: 100 ppm	TWA: 100 STEL: 150	**EH40 (UK) (Europe, 2002). Skin** TWA: 50 ppm 8 hour/hours. STEL: 100 ppm 15 minute/minutes.	**NOHSC (Australia, 2003).** STEL: 80 ppm 15 minute/minutes. STEL: 150 ppm 15 minute/minutes.
5) Cumene	**ACGIH (United States, 1994). Skin** TWA: 50 ppm **OSHA (United States, 1989). Skin** TWA: 50 ppm	TWA: 50 ppm	**EH40 (UK) (Europe). Skin** TWA: 25 ppm 8 hour/hours. TWA: 125 mg/m³ 8 hour/hours. STEL: 250 mg/m³ 15 minute/minutes.	**NOHSC (Australia, 2003). Skin** TWA: 25 ppm 8 hour/hours. STEL: 75 ppm 15 minute/minutes.
6) Benzene, 1,2,3-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
7) Ethylbenzene	**ACGIH (United States, 1994).** TWA: 100 ppm STEL: 125 ppm **OSHA (United States, 1989).** TWA: 100 ppm	TWA: 100 ppm STEL: 125 ppm	**EH40 (UK) (Europe, 2002). Skin** TWA: 100 ppm 8 hour/hours. STEL: 125 ppm 15 minute/minutes.	**NOHSC (Australia, 2003).** TWA: 100 ppm 8 hour/hours. STEL: 125 ppm 15 minute/minutes.

9. Physical and Chemical Properties

Physical State and Appearance : Liquid.

Density : Not determined.

Specific Gravity : 0.921

Solubility : Insoluble in cold water.

Viscosity : 11.47 cSt @ 40°C

Auto-Ignition Temperature : Not determined.

Flash Point : Closed cup: 52°C (125.6°F). (Pensky-Martens. Minimum)

10. Stability and Reactivity

Stability : The product is stable.

Materials to avoid : Strong oxidizing and reducing agents.

Conditions to avoid : High temperatures, sparks, and open flames.

11. Toxicological Information

Routes of Entry : Skin, Eyes, Ingestion, and Inhalation.

Target Organs : Contains material which may cause damage to the following organs: blood, kidneys, liver, gastrointestinal tract, upper respiratory tract, skin, eyes, central nervous system (CNS).

Acute Effects

Inhalation : Irritating to respiratory system.

Ingestion : Aspiration hazard if swallowed. Can enter lungs and cause damage. Does not meet EU R65 classification criteria.
Ingestion may cause gastrointestinal irritation and diarrhea.

Skin Contact : Non-irritating to the skin.

Eye Contact : Non-irritating to the eyes.

Chronic Effects

Adverse Effects : - Adverse symptoms may include: In the presence of slight maternal toxicity, fetotoxic effects have been observed in the offspring of rats exposed by inhalation to Solvent Naphtha (petroleum) light aromatic.
- Adverse symptoms may include: This product contains trimethylbenzene. Literature data indicate that long-term inhalation exposure causes blood effects in laboratory animals.
- Adverse symptoms may include: Central nervous system, liver, kidneys, and blood effects by inhalation and heart beat irregularity (arrythmia) and heart beat - increase. High exposures to xylene in some animal studies, often at levels toxic to the mother, affected embryo/fetal development. The significance of this finding to humans is not known.

Carcinogenic Effects : Classified A3 (Proven for animals.) by ACGIH, 2B (Possible for humans.) by IARC [Ethylbenzene].

Toxicity Data

Ingredient Name	Test	Result	Route	Species
Solvent naphtha (petroleum), light aromatic	LD50	8400 mg/kg	Oral	Rat
	LD50	5000 mg/kg	Oral	Rat
Benzene, 1,2,4-trimethyl-	LD50	5000 mg/kg	Oral	Rat
	LC50	18000 mg/m^3 (4 hour/hours)	Inhalation	Rat
Benzene, 1,3,5-trimethyl-	LC50	24000 mg/m^3 (4 hour/hours)	Inhalation	Rat
N-Propylbenzene	LD50	6040 mg/kg	Oral	Rat
Xylene	LD50	4300 mg/kg	Oral	Rat
	LD50	>14100 mg/kg	Dermal	Rabbit
	LC50	5000 to 8500 ppm (4 hour/hours)	Inhalation	Rat
Cumene	LD50	1400 mg/kg	Oral	Rat
	LD50	12750 mg/kg	Oral	Mouse
	LD50	10578 mg/kg	Dermal	Rabbit
	LC50	8000 ppm (4 hour/hours)	Inhalation	Rat
Ethylbenzene	LD50	3500 mg/kg	Oral	Rat
	LD50	17800 mg/kg	Dermal	Rabbit
	LC50	4000 ppm (4 hour/hours)	Inhalation	Rat

Other information : Not available.

12. Ecological Information

Environmental Hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Based on calculation.

Environmental Fate : This product contains components which may be persistent in the environment.

13. Disposal Consideration

Waste Handling and Disposal : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport Information

Regulatory Information	UN number	Proper shipping name	Class	Packing Group	Label	Additional information
DOT Classification	NA1993	Combustible liquids, n.o.s. (Xylene, Petroleum distillates)	Combustible liquid.	III		-
TDG Classification	UN1993	Flammable liquids, n.o.s. (Xylene, Petroleum distillates)	3	III		-
ADR/RID Class	UN1993	Flammable liquids, n.o.s. (Xylene, Petroleum distillates)	3	III		Hazard identification number 30
IMDG Class	UN1993	Flammable liquids, n.o.s. (Xylene, Petroleum distillates)	3	III		-
IATA-DGR Class	UN1993	Flammable liquids, n.o.s. (Xylene, Petroleum distillates)	3	III		-
ADG Class	UN1993	Flammable liquids, n.o.s. (Xylene, Petroleum distillates)	3	III		-

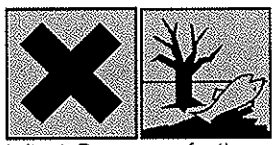
Notice to Reader

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions.

15. Regulatory Information

EU Regulations

Hazard Symbol(s) :



Irritant, Dangerous for the environment.

Risk Phrases : R10- Flammable.
R37- Irritating to respiratory system.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapors may cause drowsiness and dizziness.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases : S16- Keep away from sources of ignition - No smoking.
S23- Do not breathe vapor.
S57- Use appropriate containment to avoid environmental contamination.

US Regulations

SARA 313 toxic chemical notification and release reporting :

Benzene, 1,2,4-trimethyl-	20 - 30
Xylene	1 - 4.9
Cumene	1 - 4.9
Ethylbenzene	0.1 - 0.5

SARA 311/312 Hazardous Categorization : SARA 311/312 MSDS distribution - chemical inventory - hazard identification: : Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

RQ (Reportable quantity) : CERCLA: Hazardous substances.: Xylene: 100 lbs. (45.36 kg); CUMENE: 5000 lbs. (2268 kg); Ethylbenzene: 1000 lbs. (453.6 kg); Naphthalene: 100 lbs. (45.36 kg); STYRENE: 1000 lbs. (453.6 kg); Toluene: 1000 lbs. (453.6 kg); Benzene: 10 lbs. (4.536 kg); P-XYLENE: 100 lbs. (45.36 kg);

State - California Prop. 65 : **WARNING:** This product contains chemical/chemicals known to the state of California to cause cancer, birth defects or other reproductive harm.: Ethylbenzene; Naphthalene; Benzene

Canadian Regulations

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

International Inventory Status

United States	:	All components on TSCA Inventory
Canada	:	All components on DSL
Europe	:	All components on EINECS
Japan	:	All components on METI
Australia	:	All components on NICNAS
Korea	:	All components on ECL
China	:	All components on IECSC
Philippines	:	One or more components not found on PICCS

16. Other Information

PREPARATION INFORMATION

Validated by _HS&E Department (Tel: +1 804 788 5800) on 10/13/2006.

Date of Printing : **10/17/2006.**

☑ Indicates information that has changed from previously issued version.

Notice to Reader

This information and these recommendations are offered in good faith and believed to be correct as of the date hereof. Information and recommendations are supplied upon the condition that the recipients will make their own decision as to safety and suitability for their purposes. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature, are made with respect to the product or the information and recommendations. Afton makes no representation as to completeness or accuracy. In no event will Afton be responsible for damages of any nature whatsoever resulting from the use or reliance upon the information and recommendations.

ADDRESS CONTACT INFORMATION

In the United States and Canada:
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500 Spring Street
Richmond, Virginia
USA 23219-2183
Telephone number: 804-788-5800

In Singapore:
111 Somerset Road
#09-05
Singapore Power Building
Singapore 238164
Telephone number: 65-6732-0822

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Afton Chemical Asia Pacific Company
Level 9, 20 Berry Street
North Sydney, NSW 2060
Australia
Telephone number: 02-9923-1588
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44-1344-304141

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Afton Chemical Japan Corporation
Sumitomo Fudousan Sanbancho Bldg.
5F
6-26 Sanbancho, Chiyoda-ku
Tokyo 102-0075 Japan
Emergency phone: 81-3-5210-4890

*** END OF MSDS ***

Shell Canada Limited
Material Safety Data Sheet

Effective Date: 2008-10-30
Supersedes: 2005-11-07

Class B3 Combustible Liquid

Class D2B Skin Irritation

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: **ULTRA LOW SULPHUR DIESEL FUEL**
PRODUCT USE: Fuel
PRODUCT CODE: **320-110**

SUPPLIER
Shell Canada Limited (SCL)
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS

Shell Emergency Number	1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER	1-613-996-6666
For general information:	1-800-661-1600
	www.shell.ca

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.
*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Fuels, Diesel, No. 2	68476-34-6	100	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Lightly Coloured Hydrocarbon Odour
Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.
Hazards:

Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Combustible Liquid.
Irritating to skin.
Ingestion may result in vomiting. Avoid aspiration of vomitus into lungs as small quantities may result in aspiration pneumonitis.

Handling: Eliminate all ignition sources.
Wear suitable gloves and eye protection.

Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
Avoid prolonged exposure to vapours.

For further information on health effects, see Section 11.

4. FIRST AID MEASURES

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wipe excess from skin. Wash contaminated skin with mild soap and water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

Firefighting Instructions: Caution - Combustible. Do not use a direct stream of water as it may spread fire. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus. Avoid inhalation of smoke. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Product will float and can be reignited on surface of water. Containers exposed to intense heat may rupture. Use water to cool fire exposed containers. Delayed lung damage can be experienced after exposure to combustion products, sometimes hours after the exposure.

Hazardous Combustion Products: A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Combustible". Eliminate all ignition sources. Isolate hazard area and restrict access. Wear

appropriate breathing apparatus (if applicable) and protective clothing. Handling equipment must be grounded. Work upwind of spill if it is safe to do so. Avoid direct contact with material. Stop leak only if safe to do so. Dike and contain land spills; contain spills to water by booming. Use water fog to knock down vapours; contain runoff. Adsorb residue or small spills with adsorbent material and remove to non-leaking containers for disposal. Notify appropriate environmental agency(ies). After area has been cleaned up to the satisfaction of regulatory authorities, flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations.

7. HANDLING AND STORAGE

Handling: Combustible. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

The following information, while appropriate for this product, are general in nature. The selection of personal protective equipment will vary depending on the conditions of use.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Diesel fuel, as total hydrocarbons (skin): 100 mg/m3
Skin Notation: Absorption through skin, eyes and mucous membranes may contribute significantly to the total exposure.

Mechanical Ventilation: Concentrations in air should be maintained below the occupational exposure limit if unprotected personnel are involved. Use explosion-proof ventilation as required to control vapour concentrations. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Impervious gloves (viton, nitrile) should be worn at all times when handling this material. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Lightly Coloured
Odour:	Hydrocarbon Odour
Odour Threshold:	Not available
Freezing/Pour Point:	Varies with region and season
Boiling Point:	150 - 330 °C
Density:	< 881 kg/m3 @ 15 °C
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	Not available
pH:	Not applicable
Flash Point:	PMCC > 40 °C
Lower Flammable Limit:	1 % (vol.)
Upper Flammable Limit:	6 % (vol.)
Autoignition Temperature:	250 °C
Viscosity:	1.3 - 4.3 cSt @ 40 °C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (log K_{OW}):	Not available
Water Solubility:	Insoluble
Other Solvents:	Hydrocarbon Solvents
Formula:	C10 to C22 Hydrocarbons

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Hazardous Decomposition Products:	Thermal decomposition products are highly dependent on combustion conditions.
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
Fuels, Diesel, No. 2	LD50 Oral Rat = 9000 mg/kg LD50 Dermal Rabbit > 5000 mg/kg

Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.

Irritancy: This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.

Acute Toxicity:	Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Chronic Effects:	Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression.
Pre-existing Conditions:	Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.
Carcinogenicity and Mutagenicity:	The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk. The American Conference of Governmental Industrial Hygienists (ACGIH) has classified this product as A3 - confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May cause physical fouling of aquatic organisms. The immediate effect of a release is the physical impairment of the environment from the coating of surfaces, resulting in the disruption of oxygen, water and light to flora and fauna. Prolonged exposure may result in the partitioning of light-end hydrocarbon fractions into the water and gas phases of the subsurface soil environment, adversely affecting the soil quality.

Biodegradability:	Not readily biodegradable.
Bioaccumulation:	Potential for bioaccumulation. Potential for bioconcentration.
Partition Coefficient (log K_{OW}):	Not available
Aquatic Toxicity:	Product is expected to be toxic to aquatic organisms.

Ingredient:	Toxicological Data
Fuels, Diesel, No. 2	LL50 (WAF method) Rainbow Trout (96hr) 10 - 100 mg/L. EL50 Daphnia Magna (48hr) 10 - 100 mg/L. EL50 - growth rate Algae (72hr) 10 - 100 mg/L.

Definition(s): LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances.
WAF is the water accommodated fraction. A slightly soluble hydrocarbon is stirred into water and the insoluble portions are removed. The remaining solution is the water accommodated fraction.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORT INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1202
Proper Shipping Name	DIESEL FUEL
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG III
Additional Information	Not Regulated in Containers Less Than or Equal to 450 Litres.
Shipping Description	DIESEL FUEL Class 3 UN1202 PG III Not Regulated in Containers Less Than or Equal to 450 Litres.

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B3 Combustible Liquid Class D2B Skin Irritation
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.
Other Regulatory Status:	Provincial criteria are likely and should be requested when notifying provincial authorities. The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

16. OTHER INFORMATION

LABEL STATEMENTS

Hazard Statement :	Combustible Liquid. Irritating to skin.
Handling Statement:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames. Avoid prolonged exposure to vapours.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.
Revisions:	This MSDS has been reviewed and updated. Changes have been made to: Section 1 Section 3 Section 4 Section 5 Section 6 Section 9 Section 12 Section 15

Shell Canada Limited
Material Safety Data Sheet

Effective Date: 2008-08-01
Supersedes: 2008-08-01

Class B3 Combustible Liquid

Class D2B Skin Irritation

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: **SHELL* KEROSENE**
PRODUCT USE: Fuel Solvent
PRODUCT CODE: **301-101**

SUPPLIER
Shell Canada Limited (SCL)
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS

Shell Emergency Number	1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER	1-613-996-6666
For general information:	1-800-661-1600
	www.shell.ca

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.
*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Kerosene (Petroleum), Hydrodesulfurized	64742-81-0	98 - 100	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Lightly Coloured Hydrocarbon Odour
Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.
Hazards:

Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Combustible Liquid.
Irritating to skin.
Ingestion may result in vomiting. Avoid aspiration of vomitus into lungs as small quantities may result in aspiration pneumonitis.

Handling: Eliminate all ignition sources.

Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
Avoid prolonged exposure to vapours.

For further information on health effects, see Section 11.

4. FIRST AID MEASURES

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

Firefighting Instructions: Caution - Combustible. Do not use a direct stream of water as it may spread fire. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus. Avoid inhalation of smoke. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Product will float and can be reignited on surface of water. Delayed lung damage can be experienced after exposure to combustion products, sometimes hours after the exposure.

Hazardous Combustion Products: A complex mixture of airborne solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Combustible". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Work upwind of spill if it is safe to do so. Avoid direct contact with material.

Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain spills to water by booming. Use water fog to knock down vapours; contain runoff. Adsorb residue or small spills with adsorbent material and remove to non-leaking containers for disposal. Notify appropriate environmental agency(ies). After area has been cleaned up to the satisfaction of regulatory authorities, flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations.

7. HANDLING AND STORAGE

Handling: Combustible. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

The following information, while appropriate for this product, are general in nature. The selection of personal protective equipment will vary depending on the conditions of use.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Kerosene/Jet fuels, as total hydrocarbon vapour (skin) : 200 mg/m3 (Application restricted to conditions in which there are negligible aerosol exposures.)
Skin Notation: Absorption through skin, eyes and mucous membranes may contribute significantly to the total exposure.

Mechanical Ventilation: Concentrations in air should be maintained below the occupational exposure limit if unprotected personnel are involved. Use explosion-proof ventilation as required to control vapour concentrations. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Impervious gloves (viton, nitrile) should be worn at all times when handling this material. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.

Respiratory Protection: If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Lightly Coloured
Odour:	Hydrocarbon Odour
Odour Threshold:	Not available
Freezing/Pour Point:	< -40 °C
Boiling Point:	< 300 °C
Density:	Not available
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	Not available
pH:	Not available
Flash Point:	PMCC > 38 °C
Lower Flammable Limit:	0.7 % (vol.)
Upper Flammable Limit:	5 % (vol.)
Autoignition Temperature:	229 °C
Viscosity:	Not available
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (log K_{OW}):	Not available
Water Solubility:	Insoluble
Other Solvents:	Hydrocarbon Solvents
Formula:	C10 - C18

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Hazardous Decomposition Products:	Thermal decomposition products are highly dependent on combustion conditions.
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
Kerosene (Petroleum), Hydrodesulfurized	LD50 Oral Rat > 5000 mg/kg LD50 Dermal Rabbit > 2000 mg/kg

Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.
Irritancy: This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.

Acute Toxicity: Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.

Chronic Effects: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression.

Pre-existing Conditions: Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

Carcinogenicity and Mutagenicity: The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk. The American Conference of Governmental Industrial Hygienists (ACGIH) has classified this product as A3 - confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May cause physical fouling of aquatic organisms. The immediate effect of a release is the physical impairment of the environment from the coating of surfaces, resulting in the disruption of oxygen, water and light to flora and fauna. Prolonged exposure may result in the partitioning of light-end hydrocarbon fractions into the water and gas phases of the subsurface soil environment, adversely affecting the soil quality.

Biodegradability: Not readily biodegradable.

Bioaccumulation: Potential for bioaccumulation.
Potential for bioconcentration.

Partition Coefficient (log K_{OW}): Not available

Aquatic Toxicity: Product is expected to be toxic to aquatic organisms.

Ingredient:	Toxicological Data
Kerosene (Petroleum), Hydrodesulfurized	LL50 (WAF method) Rainbow Trout (96hr) 1 - 10 mg/L. EL50 (WAF method) Daphnia Magna (48hr) 1 - 10 mg/L. EL50 - growth rate (WAF method) Algae (72hr) 1 - 10 mg/L.

Definition(s): LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances.
WAF is the water accommodated fraction. A slightly soluble hydrocarbon is stirred into water and the insoluble portions are removed. The remaining solution is the water accommodated fraction.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORT INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1223
Proper Shipping Name	KEROSENE
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG III
Additional Information	Not Regulated in Containers Less Than or Equal to 450 Litres.
Shipping Description	KEROSENE Class 3 UN1223 PG III Not Regulated in Containers Less Than or Equal to 450 Litres.

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B3 Combustible Liquid Class D2B Skin Irritation
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.
Other Regulatory Status:	No Canadian federal standards. Provincial criteria are likely and should be requested when notifying provincial authorities.

16. OTHER INFORMATION

LABEL STATEMENTS

Hazard Statement :	Combustible Liquid. Irritating to skin.
Handling Statement:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames. Avoid prolonged exposure to vapours.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.
Revisions:	This MSDS has been reviewed and updated. Changes have been made to: Section 2 Section 3 Section 6 Section 8 Section 9 Section 12 Section 15

Shell Canada Limited
Material Safety Data Sheet

Effective Date: 2007-05-25
Supersedes: 2005-07-26

Class B2 Flammable Liquid

Class D2A Carcinogenicity

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: **SHELL BRONZE GASOLINE**
SYNONYMS: Automotive Fuel
Petrol
PRODUCT USE: Fuel
PRODUCT CODE: **211-100**

SUPPLIER
Shell Canada Limited (SCL)
P.O. Box 100, Station M
400-4th Ave. S.W.
Calgary, AB Canada
T2P 2H5

TELEPHONE NUMBERS

Shell Emergency Number	1-800-661-7378
CANUTEC 24 HOUR EMERGENCY NUMBER	1-613-996-6666
For general information:	1-800-661-1600
	www.shell.ca

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.
*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Gasoline	86290-81-5	> 90	Yes
Benzene	71-43-2	< 1.5	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Volatile Liquid Colourless Typical Gasoline Odour
Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.
Hazards:

Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Flammable Liquid.
Contains Benzene.
May cause cancer.

Ingestion may result in vomiting. Avoid aspiration of vomitus into lungs as small quantities may result in aspiration pneumonitis.
May be absorbed by skin contact.
In rare cases may sensitize heart muscle causing heart arrythmia.

Handling: Eliminate all ignition sources.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Avoid prolonged exposure to vapours.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID MEASURES

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for at least 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

Firefighting Instructions: Flammable. Clear area of unprotected personnel. Do not use a direct stream of water as it may spread fire. Product will float and can be reignited on surface of water. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Avoid breathing vapours. Avoid inhalation of smoke. Vapours may travel along ground and flashback along vapour trail may occur. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus. Delayed lung damage can be experienced after exposure to combustion products, sometimes hours after the exposure.

Hazardous Combustion Products: Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Flammable". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Work upwind of spill if it is safe to do so. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain spills to water by booming. Use water fog to knock down vapours; contain runoff. Adsorb residue or small spills with adsorbent material and remove to non-leaking containers for disposal. Notify appropriate environmental agency(ies). After area has been cleaned up to the satisfaction of regulatory authorities, flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations.

7. HANDLING AND STORAGE

Handling: Flammable. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Avoid breathing vapours and prolonged or repeated contact with skin. Vapours may accumulate and travel to distant ignition sources and flashback. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers. Provide adequate ventilation. Launder contaminated clothing prior to reuse. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Use explosion-proof ventilation to prevent vapour accumulation.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

The following information, while appropriate for this product, are general in nature. The selection of personal protective equipment will vary depending on the conditions of use.

OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Gasoline: 300 ppm (STEL: 500 ppm)
Benzene (skin) : 0.5 ppm (STEL: 2.5 ppm)
Skin Notation: Absorption through skin, eyes and mucous membranes may contribute significantly to the total exposure.

Mechanical Ventilation: Concentrations in air should be maintained below the occupational exposure limit if unprotected personnel are involved. Use explosion-proof ventilation as required to control vapour concentrations. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

Skin Protection: Avoid contact with skin. Use protective clothing and gloves manufactured from nitrile. Safety showers should be available for emergency use.

Respiratory Protection: Avoid breathing vapour or mists. If exposure has the potential to exceed occupational exposure limits, use an appropriate NIOSH-approved respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Volatile Liquid
Appearance:	Colourless
Odour:	Typical Gasoline Odour
Odour Threshold:	< 0.25 ppm
Freezing/Pour Point:	Not available
Boiling Point:	35 - 220 °C
Density:	720 - 760 kg/m3 @ 15 °C
Vapour Density (Air = 1):	3.5
Vapour Pressure (absolute):	< 107 kPa @ 38 °C
Specific Gravity (Water = 1):	0.74
pH:	Not applicable
Flash Point:	TCC -30 °C
Lower Flammable Limit:	1.4 % (vol.)
Upper Flammable Limit:	7.6 % (vol.)
Autoignition Temperature:	280 °C
Viscosity:	< 1 cSt @ 38 °C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (log K_{OW}):	2.3
Water Solubility:	Insoluble
Other Solvents:	Hydrocarbon Solvents
Formula:	C4 - C11

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Incompatible Materials:	Avoid contact with strong oxidizing agents and acids.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
Gasoline	LD50 Oral Rat > 18 mL/kg LD50 Dermal Rabbit > 5 mL/kg
Benzene	LD50 Oral Rat 690 - 3400 mg/kg LC50 Inhalation Rat 13700 ppm for 4 hours LD50 Dermal Rabbit > 8260 mg/kg

Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.

Formulation: No data is specifically available for this product and therefore this toxicological information is based on testing completed with the ingredients.

Irritancy: Based on testing with similar materials, this product is not expected to be a primary skin irritant after exposure of short duration, would not be a skin sensitizer and would not be irritating to the eye.

Acute Toxicity: Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.

Chronic Effects: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression. Prolonged and repeated exposure may cause serious injury to blood forming organs, resulting in anemia and similar conditions. Myelodysplastic syndrome (MDS) has been observed in people exposed to very high levels (50 to 300 ppm) of benzene over a long period of time in the workplace. The relevance of these results to lower levels of exposure is not known.

Carcinogenicity and Mutagenicity: According to the International Agency for Research on Cancer (IARC) this product is considered to be possibly carcinogenic to humans. This product contains benzene. Carcinogenic hazard. Repeated exposure to benzene concentrations greater than the recommended TLV/TWA may reduce the cellular components of peripheral blood and bone marrow. Epidemiological studies indicate that long term inhalation of benzene vapour can cause leukaemia in man. Benzene has also produced chromosomal aberrations in peripheral blood lymphocytes.

12. ECOLOGICAL INFORMATION

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities.

Biodegradability: Inherently biodegradable.
Rapid volatilization.

Bioaccumulation: Potential for bioaccumulation.

Partition Coefficient (log K_{OW}): 2.3

Aquatic Toxicity: Product is expected to be toxic to aquatic organisms.

Ingredient:	Toxicological Data
Gasoline	LL50 (WAF method) Rainbow Trout (96hr) 1 - 10 mg/L. EL50 (WAF method) Daphnia Magna (48hr) 1 - 10 mg/L. EL50 - growth rate (WAF method) Algae (72hr) 1 - 10 mg/L.
Benzene	LL50 Rainbow Trout (96hr) 1 - 10 mg/L. EL50 Daphnia Magna (48hr) 10 - 100 mg/L. EL50 - growth rate Algae (72hr) 10 - 100 mg/L.

Definition(s): LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances.
WAF is the water accommodated fraction. A slightly soluble hydrocarbon is stirred into water and the insoluble portions are removed. The remaining solution is the water

accommodated fraction.

13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

14. TRANSPORT INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1203
Proper Shipping Name	GASOLINE
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG II
Additional Information	Marine Pollutant
Shipping Description	GASOLINE Class 3 UN1203 PG II Marine Pollutant

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B2 Flammable Liquid Class D2A Carcinogenicity
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.
Other Regulatory Status:	No Canadian federal standards.

16. OTHER INFORMATION

LABEL STATEMENTS

Hazard Statement :	Flammable Liquid. Contains Benzene. May cause cancer.
Handling Statement:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Avoid prolonged exposure to vapours. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting.

Obtain medical attention.

Revisions: This MSDS has been reviewed and updated. Section 1 Section 2 Section 3 Section 4 Section 5 Section 6 Section 7 Section 8 Section 11 Section 12

80W90
~~15W-40~~

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Name: HDH (All)
Synthetic HDH (All)
Synthetic IDO 50 (All)
Product Class: Lubricant
WHMIS Classification: Not Controlled.

Supplier Name and Address: Irving Oil
10 Sydney Street
Saint John, N.B.
E2L 4K1

Phone: (506) 632-2000
Emergency: (506) 648-3060

SECTION 2 - HAZARDOUS INGREDIENTS OF MATERIALS

Hazardous Ingredients	CAS#	wt%	ACGIH-TLV	LC_{50}	LD_{50}
None			5 mg/m^3 (oil mist)		

SECTION 3 - PHYSICAL DATA AND CHEMICAL PROPERTIES

Form: Liquid
Colour: Brown
Odour: Pungent
Specific Gravity @ 15°C: 0.88 - 0.92
Solubility: Negligible
Vapour Pressure (mm @ 20°C): < 0.10

SECTION 4 - FIRE AND EXPLOSION HAZARD

Flammability: ☒Yes ☐ No
Flash Point : > 200°C (COC)
Conditions: Open flame above flash point.

Upper Flammable Limit: Not established.
Auto Ignition Temperature: Not determined.
Sensitivity to Impact: None.
Lower Flammable Limit: Not established.
TDG Flammability Classification: Not classified.
Sensitivity to Static Discharge: None.

Means of Extinction: Dry chemical, water spray (fog), foam or carbon dioxide.
Hazardous Combustion Products: Hydrogen sulphide and oxides of carbon, nitrogen, sulphur and phosphorus.
Special Procedures: Water foam may cause frothing. Use water to cool exposed containers. Use self-contained breathing apparatus for fire fighting.

SECTION 5 - REACTIVITY DATA

Stability: This product is stable.
Hazardous Polymerisation: Will not occur.
Conditions to avoid: Extremely high temperatures.
Incompatibility with other substances: Strong oxidising agents.
Hazardous decomposition products: Thermal decomposition from high temperature or combustion will produce hydrogen sulphide and oxides of carbon, nitrogen, sulphur and phosphorus.

SECTION 6 - TOXICOLOGICAL PROPERTIES

Route of Entry: ☐Eye ☒ Skin Contact ☐ Skin Absorption ☒ Inhalation ☒ Ingestion

Effects of Acute Exposure: Irritation to skin and eyes. Inhalation of hot oil mist or vapours may irritate the upper respiratory tract.
Effects of Chronic Exposure: Repeated or prolonged exposure may cause dermatitis and/or oil acne. Long-term intensive exposure to oil mist may cause benign lung fibrosis. No specific toxicity data but extrapolation from similar materials indicates that this product has low oral toxicity.

Exposure Limits: 5 mg/m^3 (oil mist)
Reproductive Toxicity: Not determined.
Irritancy of Product: Slight.
Carcinogenicity: Not determined.
Teratogenicity: Not determined.
Mutagenicity: Not determined.

SECTION 7 – PREVENTATIVE AND CORRECTIVE MEASURES

Personal Protective Equipment:	*Gloves:*	Oil/Chemical resistant.
	Eye:	Chemical safety glasses or full face shield.
	Respiratory:	NOISH respirator if mist levels are high.
	Footwear:	Oil/Chemical resistant.
	Clothing:	Oil/Chemical resistant if repeated exposure to skin and clothing occurs.
	Other:	
Engineering Controls:	Local exhaust at source of heated vapours.	
Leak and Spill Procedure:	Contain spills with dikes or absorbent material. Eliminate fire hazards. Prevent from entering sewers or water courses. Vacuum liquid or transfer absorbed material into containers. Advise authorities.	
Waste Disposal:	Follow local and governmental regulations. Not regulated as a hazardous waste.	
Storage Requirements	Cool, dry location. Keep containers closed.	
Special Shipping Information:	No special requirements.	

SECTION 8 - FIRST AID MEASURES

Inhalation:	Remove to fresh air or give artificial respiration. If breathing is difficult, give oxygen and seek medical attention.
Ingestion:	Do not induce vomiting, give two glasses of water and seek medical attention.
Eye:	Flush with water for 15 minutes.
Skin:	Wash contaminated area with soap and water. Clean contaminated clothing before wearing again.
General Advice:	High pressure injection under skin can be serious and requires urgent medical attention.

SECTION 9 - PREPARATION DATE OF MSDS

MSDS Prepared by: Irving Lubricants **Phone:** (506) 632-7000
MSDS Date: February 14, 2007
Revision 02

15W 40

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Name: IDO Premium Plus
Product Class: Lubricant
WHMIS Classification: Not Controlled.

Supplier Name and Address: Irving Oil
10 Sydney Street
Saint John, N.B.
E2L 4K1

Phone: (506) 632-2000
Emergency: (506) 648-3060

SECTION 2 - HAZARDOUS INGREDIENTS OF MATERIALS

Hazardous Ingredients	CAS#	wt%	ACGIH-TLV	LC_{50}	LD_{50}
None			5 mg/m^3 (oil mist)		

SECTION 3 - PHYSICAL DATA AND CHEMICAL PROPERTIES

Form: Liquid
Color: Brown
Odor: Petroleum
Specific Gravity @ 60°F: 0.86 – 0.90
Solubility: Negligible

Vapor Pressure (mm @ 68°F): < 0.10
Volatile (wt%): 0

SECTION 4 - FIRE AND EXPLOSION HAZARD

Flammability: ☒Yes ☐ No
Flash Point : > 428°F (COC)
Conditions: Open flame above flash point.

Upper Flammable Limit: Not established.
Auto Ignition Temperature: Not determined.
Sensitivity to Impact: None.

Lower Flammable Limit: Not established.
TDG Flammability Classification: Not classified.
Sensitivity to Static Discharge: None.

Means of Extinction: Dry chemical, water spray (fog), foam, carbon dioxide or dry chemical.
Hazardous Combustion Products: Hydrogen sulfide and oxides of carbon, nitrogen, sulfur and phosphorus.
Special Procedures: Water foam may cause frothing. Use water to cool exposed containers. Use self-contained breathing apparatus for fire fighting.

SECTION 5 - REACTIVITY DATA

Stability: This product is stable.
Hazardous Polymerization: Will not occur.
Conditions to avoid: Extremely high temperatures, sparks and open flame.
Incompatibility with other substances: Strong oxidizing and reducing agents.
Hazardous decomposition products: Thermal decomposition from high temperature or combustion will produce hydrogen sulfide and oxides of carbon, nitrogen, sulfur and phosphorus.

MATERIAL SAFETY DATA SHEET

SECTION 6 - TOXICOLOGICAL PROPERTIES

Route of Entry: ☐Eye ☒ Skin Contact ☐ Skin Absorption ☒ Inhalation ☒ Ingestion

Effects of Acute Exposure: Irritation to skin and eyes. Inhalation of hot oil mist or vapors may irritate the upper respiratory tract.
Effects of Chronic Exposure: Repeated or prolonged exposure may cause dermatitis and/or oil acne. Long-term intensive exposure to oil mist may cause benign lung fibrosis. No specific toxicity data but extrapolation from similar materials indicates that this product has low oral toxicity.

Exposure Limits:	5 mg/m^3 (oil mist)	**Carcinogenicity:**	Not determined.
Reproductive Toxicity:	Not determined.	**Teratogenicity:**	Not determined.
Irritancy of Product:	Slight.	**Mutagenicity:**	Not determined.

SECTION 7 - PREVENTATIVE AND CORRECTIVE MEASURES

Personal Protective Equipment:	*Gloves:*	Oil/Chemical resistant.
	Eye:	Chemical safety glasses or full face shield.
	Respiratory:	NOISH respirator if mist levels are high.
	Footwear:	Oil/Chemical resistant.
	Clothing:	Oil/Chemical resistant if repeated exposure to skin and clothing occurs.
	Other:	

Engineering Controls: Local exhaust at source of heated vapors.
Leak and Spill Procedure: Contain spills with dikes or absorbent material. Eliminate fire hazards. Prevent from entering sewers or water courses. Vacuum liquid or transfer absorbed material into containers. Advise authorities.
Waste Disposal: Follow local and governmental regulations. Not regulated as a hazardous waste.
Storage Requirements Cool, dry location. Keep containers closed.
Special Shipping Information: No special requirements.

SECTION 8 - FIRST AID MEASURES

Inhalation: Remove to fresh air or give artificial respiration. If breathing is difficult, give oxygen and seek medical attention.
Ingestion: Do not induce vomiting, give two glasses of water and seek medical attention.
Eye: Flush with water for 15 minutes.
Skin: Wash contaminated area with soap and water. Clean contaminated clothing before wearing again.
General Advice: High pressure injection under skin can be serious and requires urgent medical attention.

SECTION 9 - PREPARATION DATE OF MSDS

MSDS Prepared by: Irving Lubricants **Phone:** (506) 632-7000
MSDS Date: Feb 1, 2008
Revision 02

10 W

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Name: Transflo TO-4 (All)
Product Class: Lubricant
WHMIS Classification: Not Controlled.

Supplier Name and Address: Irving Oil Limited
P.O. Box 1421
Saint John, N.B.
E2L 4K1

Phone: (506) 632-2000
Emergency: (506) 648-3060

SECTION 2 - HAZARDOUS INGREDIENTS OF MATERIALS

Hazardous Ingredients	CAS#	wt%	ACGIH-TLV	LC_{50}	LD_{50}
None			5 mg/m^3 (oil mist)		

SECTION 3 - PHYSICAL DATA AND CHEMICAL PROPERTIES

Form: Liquid
Colour: Brown
Odour: Petroleum
Specific Gravity @ 15°C: 0.88 - 0.90
Solubility: Negligible

Vapour Pressure (mm @ 20°C): < 0.10

SECTION 4 - FIRE AND EXPLOSION HAZARD

Flammability: ☒Yes ☐ No
Flash Point : > 220°C (COC)
Conditions: Open flame above flash point.

Upper Flammable Limit: Not established.
Auto Ignition Temperature: Not determined.
Sensitivity to Impact: None.

Lower Flammable Limit: Not established.
TDG Flammability Classification: Not classified.
Sensitivity to Static Discharge: None.

Means of Extinction: Dry chemical, water spray (fog), foam or carbon dioxide.
Hazardous Combustion Products: Hydrogen sulphide and oxides of carbon, nitrogen, sulphur and phosphorus.
Special Procedures: Water foam may cause frothing. Use water to cool exposed containers. Use self-contained breathing apparatus for fire fighting.

SECTION 5 - REACTIVITY DATA

Stability: This product is stable.
Hazardous Polymerisation: Will not occur.
Conditions to avoid: Extremely high temperatures.
Incompatibility with other substances: Strong oxidising agents.
Hazardous decomposition products: Thermal decomposition from high temperature or combustion will produce hydrogen sulphide and oxides of carbon, nitrogen, sulphur and phosphorus.

SECTION 6 - TOXICOLOGICAL PROPERTIES

Route of Entry: ☐Eye ☒ Skin Contact ☐ Skin Absorption ☒ Inhalation ☒ Ingestion

Effects of Acute Exposure: Irritation to skin and eyes. Inhalation of hot oil mist or vapours may irritate the upper respiratory tract.
Effects of Chronic Exposure: Repeated or prolonged exposure may cause dermatitis and/or oil acne. Long-term intensive exposure to oil mist may cause benign lung fibrosis. No specific toxicity data but extrapolation from similar materials indicates that this product has low oral toxicity.

Exposure Limits: 5 mg/m^3 (oil mist)
Reproductive Toxicity: Not determined.
Irritancy of Product: Slight.

Carcinogenicity: Not determined.
Teratogenicity: Not determined.
Mutagenicity: Not determined.

MATERIAL SAFETY DATA SHEET

SECTION 7 - PREVENTATIVE AND CORRECTIVE MEASURES

Personal Protective Equipment:	*Gloves:*	Oil/Chemical resistant.
	Eye:	Chemical safety glasses or full face shield.
	Respiratory:	NOISH respirator if mist levels are high.
	Footwear:	Oil/Chemical resistant.
	Clothing:	Oil/Chemical resistant if repeated exposure to skin and clothing occurs.
	Other:	
Engineering Controls:	Local exhaust at source of heated vapours.	
Leak and Spill Procedure:	Contain spills with dikes or absorbent material. Eliminate fire hazards. Prevent from entering sewers or water courses. Vacuum liquid or transfer absorbed material into containers. Advise authorities.	
Waste Disposal:	Follow local and governmental regulations. Not regulated as a hazardous waste.	
Storage Requirements	Cool, dry location. Keep containers closed.	
Special Shipping Information:	No special requirements.	

SECTION 8 - FIRST AID MEASURES

Inhalation:	Remove to fresh air or give artificial respiration. If breathing is difficult, give oxygen and seek medical attention.
Ingestion:	Do not induce vomiting, give two glasses of water and seek medical attention.
Eye:	Flush with water for 15 minutes.
Skin:	Wash contaminated area with soap and water. Clean contaminated clothing before wearing again.
General Advice:	High pressure injection under skin can be serious and requires urgent medical attention.

SECTION 9 - PREPARATION DATE OF MSDS

MSDS Prepared by: Irving Lubricants **Phone:** (506) 632-7000
MSDS Date: February 14, 2007
Revision 02

TRANSMISSION

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Name:	Transflo MV
Product Class:	Lubricant
WHMIS Classification:	Not Controlled.

Supplier Name and Address: Irving Oil Marketing Limited
P.O. Box 1421
Saint John, N.B.
E2L 4K1

Phone: (506) 632-2000
Emergency: (506) 648-3060

SECTION 2 - HAZARDOUS INGREDIENTS OF MATERIALS

Hazardous Ingredients	CAS#	wt%	TLV-TWA (8 h)	STEL	LD_{50}
None	Mixture	100	5 mg/m^3 (oil mist)	10 mg/m^3 (oil mist)	

SECTION 3 - PHYSICAL DATA AND CHEMICAL PROPERTIES

Physical State & Appearnace:	Viscous liquid	**Viscosity:**	34.3 cSt @ 40°C (104°F), 7.8 cSt @ 100°C (212°F), VI=204
Colour:	Dark Red	**Pour Point:**	-45°C
Odour:	No odour or slight petroleum oil like.		
Odour Threshold:	Not available	**Vapour Pressure:**	Negligible at ambient temperature and pressure
Density:	0.8544 kg/L @ 15°C (59°F)	**Volatility:**	Non-volatile

SECTION 4 - FIRE AND EXPLOSION HAZARD

Flammability: ☒Yes ☐ No
Flash Point : Closed Cup: 160°C (320°F) (Pensky-Martens)
Conditions: Open flame above flash point.
Open Cup: 185°C (365°F) (Cleveland)

Upper Flammable Limit:	Not established.	**Lower Flammable Limit:**	Not established.
Auto Ignition Temperature:	Fire Point: 212°C (413.6°F)	**TDG Flammability Classification:**	Not classified.
Sensitivity to Impact:	None.	**Sensitivity to Static Discharge:**	None.

Means of Extinction: Dry chemicals, water spray, fog, foam or CO2.

Hazardous Combustion Products: Carbon oxides (CO, CO2), nitrogen oxides (NOx), smoke and irritating vapours as products of incomplete combustion.

Special Procedures: NAERG96, GUIDE 171, Substances (low to moderate hazard). If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (0.5 mile) in all directions; also, consider initial evacuation for 800 meters (0.5 mile) in all directions. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. For small outdoor fires, portable fire extinguishers may be used, and self contained breathing apparatus (SCBA) may not be required. For all indoor fires and any significant outdoor fires, SCBA is required. Respiratory and eye protection are required for fire fighting personnel.

Fire Hazards in Presence of Various Substances: Low fire hazard. This material must be heated before ignition will occur.

Explosion Hazards in Presence of Various Substances: Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire.

SECTION 5 - REACTIVITY DATA

Stability:	This product is stable under normal handling and storage conditions.
Hazardous Polymerisation:	Will not occur under normal working conditions.
Conditions to avoid/Incompatibility Substances:	Reactive with oxidizing agents and reducing agents.
Hazardous decomposition products:	May release COx, NOx, smoke and irritating vapours when heated to decomposition.

SECTION 6 - TOXICOLOGICAL PROPERTIES

Route of Entry: ☒Eye ☒ Skin Contact ☐ Skin Absorption ☒ Inhalation ☒ Ingestion

Effects of Acute Exposure:

Based on toxicity of components.
Acute oral toxicity (LD50): >5000 mg/kg (rat).
Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).
Acute inhalation toxicity (LC50): >2500 mg/m^3/4h (rat).

Effects of Chronic or Other Exposure:

Dermal Route: Prolonged or repeated contact may cause skin irritation characterized by dermatitis or oil acne.
Inhalation Route: Negligible breathing hazard at normal temperatures (up to 38°C) or recommended blending temperatures. Elevated temperatures or mechanical action may form vapours, mists or fumes. Inhalation of oil mists or vapours from hot oil may cause irritation of the upper respiratory tract.
Oral Route: Low toxicity; has laxative effect.
Eye Irritation/Inflammation: Repeated or prolonged contact may cause transient irritation, but no permanent damage.
Immunotoxicity: Not available
Skin Sensitization: this product is not expected to be a skin sensitizer, based on the available data and the known hazards of the components.
Respiratory Tract Sensitization: This product is not expected to be a respiratory tract sensitizer, based on the available data and the known hazards of the components.
Mutagenic: Based on actual test results of base oils and results of similar products, severely hydrotreated base oils given negative results when tested for: (a) Salmonella Typhimurium TA98 using the Modified Ames Assay for Petroleum Product; (b) Salmonella-Escherichia coli/Mammalian-Microsome Reverse Mutation Assay (Ames test) with a Confirmatory Assay; (c) Structural Chromosomal Aberrations in Chinese Hamster Ovary (CHO) cells.
Reproductive Toxicity: This product is not expected to be a reproductive hazard, based on the available data and the known hazards of the components.
Teratogenicity/Embryotoxicity: This product is not expected to be a teratogen or an embryotoxin, based on the available data and the known hazards of the components.
Carcinogenicity (ACGIH): This product is not known to contain any chemicals at reportable quantities that are listed as A1 or A2 carcinogens by ACGIH.
Carcinogenicity (IARC): This product is not known to contain any chemicals at reportable quantities that are listed as group 1, 2A or 2B carcinogens by IARC.
Carcinogenicity (NTP): This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by NTP.
Carcinogenicity (IRIS): Not available.
Carcinogenicity (OSHA): This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.

Other Considerations: No additional remark.

SECTION 7 - PREVENTATIVE AND CORRECTIVE MEASURES

Personal Protective Equipment: ***The selection of personal protective equipment varies, depending upon conditions of use.***

Hands:	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Eyes:	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be determined based on conditions of use. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Respiratory:	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) and where engineering, work practices or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.
Feet:	Wear appropriate footwear to prevent product from coming in contact with feet or skin.
Body:	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.

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

Leak and Spill Procedure: NAERG96, Guide 171, Substances (low to moderate hazard). ELIMINATE ALLIGNITION SOURCES. Avoid contact. Stop leak in without risk. Contain spill. Absorb with inert absorbents, dry clay, or diatomaceous earth. Avoid inhaling dust of diatomaceous earth for it may contain silica in very fine particle size, making this a potential respiratory hazard. Place use absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Waste Disposal: Spent/used/water oil may meet the requirements of a hazardous waste. Consult your local or regional authorities. Preferred waste management priorities are: (1) recycle or reprocess; (2) incineration with energy recovery; (3) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

Storage Requirements: Store in tight closed containers in cool, dry isolated, well-ventilated area and away from incompatibles.

Handling Requirements: Avoid inhalation and skin contact especially when handling used oil. Keep away from sources of ignition. DO NOT reuse empty containers without commercial cleaning or reconditioning. Practice good personal hygiene. Wash hands after handling and before eating. Launder work clothes frequently. Discard saturated leather goods.

Special Shipping Information: TDG Classification: Not controlled under TDG (Canada).
Special Provisions for Transport: Not applicable

SECTION 8 - FIRST AID MEASURES

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

Ingestion: DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.

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

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

SECTION 9 - PREPARATION DATE OF MSDS

MSDS Prepared by: Irving Lubricants
MSDS Date: February 4, 2008

Phone: 1.800.574.5823 or 506.632.7000
Fax: 1.866.448.6144 or 506.632.7001

Revision 02

30 W

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Name: Transflo TO-4 (All)
Product Class: Lubricant
WHMIS Classification: Not Controlled.

Supplier Name and Address: Irving Oil Limited
P.O. Box 1421
Saint John, N.B.
E2L 4K1

Phone: (506) 632-2000
Emergency: (506) 648-3060

SECTION 2 - HAZARDOUS INGREDIENTS OF MATERIALS

Hazardous Ingredients	CAS#	wt%	ACGIH-TLV	LC_{50}	LD_{50}
None			5 mg/m^3 (oil mist)		

SECTION 3 - PHYSICAL DATA AND CHEMICAL PROPERTIES

Form: Liquid
Colour: Brown
Odour: Petroleum
Specific Gravity @ 15°C: 0.88 - 0.90
Solubility: Negligible

Vapour Pressure (mm @ 20°C): < 0.10

SECTION 4 - FIRE AND EXPLOSION HAZARD

Flammability: ☒Yes ☐ No
Flash Point : > 220°C (COC)
Conditions: Open flame above flash point.

Upper Flammable Limit: Not established.
Auto Ignition Temperature: Not determined.
Sensitivity to Impact: None.

Lower Flammable Limit: Not established.
TDG Flammability Classification: Not classified.
Sensitivity to Static Discharge: None.

Means of Extinction: Dry chemical, water spray (fog), foam or carbon dioxide.
Hazardous Combustion Products: Hydrogen sulphide and oxides of carbon, nitrogen, sulphur and phosphorus.
Special Procedures: Water foam may cause frothing. Use water to cool exposed containers. Use self-contained breathing apparatus for fire fighting.

SECTION 5 - REACTIVITY DATA

Stability: This product is stable.
Hazardous Polymerisation: Will not occur.
Conditions to avoid: Extremely high temperatures.
Incompatibility with other substances: Strong oxidising agents.
Hazardous decomposition products: Thermal decomposition from high temperature or combustion will produce hydrogen sulphide and oxides of carbon, nitrogen, sulphur and phosphorus.

SECTION 6 - TOXICOLOGICAL PROPERTIES

Route of Entry: ☐Eye ☒ Skin Contact ☐ Skin Absorption ☒ Inhalation ☒ Ingestion

Effects of Acute Exposure: Irritation to skin and eyes. Inhalation of hot oil mist or vapours may irritate the upper respiratory tract.
Effects of Chronic Exposure: Repeated or prolonged exposure may cause dermatitis and/or oil acne. Long-term intensive exposure to oil mist may cause benign lung fibrosis. No specific toxicity data but extrapolation from similar materials indicates that this product has low oral toxicity.

Exposure Limits: 5 mg/m^3 (oil mist)
Reproductive Toxicity: Not determined.
Irritancy of Product: Slight.

Carcinogenicity: Not determined.
Teratogenicity: Not determined.
Mutagenicity: Not determined.

MATERIAL SAFETY DATA SHEET

SECTION 7 - PREVENTATIVE AND CORRECTIVE MEASURES

Personal Protective Equipment:	*Gloves:*	Oil/Chemical resistant.
	Eye:	Chemical safety glasses or full face shield.
	Respiratory:	NOISH respirator if mist levels are high.
	Footwear:	Oil/Chemical resistant.
	Clothing:	Oil/Chemical resistant if repeated exposure to skin and clothing occurs.
	Other:	
Engineering Controls:	Local exhaust at source of heated vapours.	
Leak and Spill Procedure:	Contain spills with dikes or absorbent material. Eliminate fire hazards. Prevent from entering sewers or water courses. Vacuum liquid or transfer absorbed material into containers. Advise authorities.	
Waste Disposal:	Follow local and governmental regulations. Not regulated as a hazardous waste.	
Storage Requirements	Cool, dry location. Keep containers closed.	
Special Shipping Information:	No special requirements.	

SECTION 8 - FIRST AID MEASURES

Inhalation:	Remove to fresh air or give artificial respiration. If breathing is difficult, give oxygen and seek medical attention.
Ingestion:	Do not induce vomiting, give two glasses of water and seek medical attention.
Eye:	Flush with water for 15 minutes.
Skin:	Wash contaminated area with soap and water. Clean contaminated clothing before wearing again.
General Advice:	High pressure injection under skin can be serious and requires urgent medical attention.

SECTION 9 - PREPARATION DATE OF MSDS

MSDS Prepared by: Irving Lubricants **Phone:** (506) 632-7000
MSDS Date: February 14, 2007
Revision 02

SPILL CONTENGENCY PLAN

CAM-D DEW Line Environmental Remediation

SIMPSON LAKE, NUNAVUT

APPENDIX 2

NWT Spill Report Form

Northwest Territories

NWT SPILL REPORT

(Oil, Gas, Hazardous Chemicals or other Materials)

24 – Hour Report Line
Phone: (867) 920-8130
Fax: (867) 873-6924

A Report Date and Time	B Date and Time of spill (if known)	C ☐ Original Report ☐ Update no._____	Spill Number

D Location and map coordinates (if known) and direction (if moving)

E Partly responsible for spill

F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)

G Cause of spill

H Is spill terminated? ☐ yes ☐ no	I If spill is continuing, give estimated rate	J Is further spillage possible? ☐ yes ☐ no	K Extent of contaminated area (in square meters if possible)

L Factors effecting spill or recovery (weather conditions, terrain, snow cover, etc.)	M Containment (natural depression, dikes, etc.)

N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials

O Do you require assistance? ☐ no ☐ yes, describe:	P Possible hazards to person, property, or environment; eg: fire, drink water, fish or wildlife

Q Comments or recommendations

FOR SPILL LINE USE ONLY

Lead agency

Spill significance

Lead Agency contact and time

.....

.....

.....

Is this file now closed? ☐ yes ☐ no

Reported by	Position. Employer, Location	Telephone
Reported to	Position. Employer, Location	Telephone

Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and e-mailed as an attachment to spills@gov.nt.ca. Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call to the spill line. Forms can also be printed and faxed to the spill line at 867-873-6924. Spills can still be phoned in by calling collect at 867-920-8130.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. **Please do not fill in the Report Number**: the spill line will assign a number after the spill is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. **You must include the geographic coordinates** (Refer to Section E).
E. Geographic Coordinates	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. **Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.**
G. Contractor involved?	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
H. Product Spilled	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Wherever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B)
I. Spill Source	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overfill, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m^2)
J. Factors Affecting Spill	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or environment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
K. Additional Information	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. **Please number the pages to ensure that recipients can be certain that they received all pertinent documents.** If only the spill report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	**Leave Blank**. This box is for the **Spill Line's use only**.