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**IRONONE INC.
ATTACHMENT C
FUEL SPILL CONTINGENCY PLAN
FOR DRILL SITES
AND AN EXPLORATION CAMP
MAGUSE RIVER AREA
NUNAVUT**

Prepared By: D. Graham Gill, March 7, 2007
Revised By: M. Cote, 2011

Effective Date: June 1, 2011

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1. INTRODUCTION AND PROJECT DETAILS

1.1 Company Information

This Fuel Spill Contingency Plan is effective from the date of issuance of all water licences and land use permits currently being applied for by IronOne on its Maguse River property located approximately 70 kilometres north of Arviat, Nunavut, until the expiry of said licences and permits.

The Fuel Spill Contingency Plan has been prepared for internal company use, contractor use and distributed to NWB for approval as part of IronOne's Land Use and Water Licence applications for the Maguse River Project, Nunavut.

Copies and updates of this Plan may be obtained by writing to:

P. Sobie, P.Geo
MPH Consulting Ltd
Suite 501, 133 Richmond St. W
Toronto, Ont. M5H 2L3

Company Responsible for Undertaking:

IronOne Inc.
The Exchange Tower,
130 King Street West, Suite 2500
Toronto, Ont
M5X 1A0

Company Representative (Corporate):

David D'Onofrio
CFO IronOne Inc.

Ph: 416 643-3880
Fx: 416 362-7360

Company Representative (On-site):

Project Supervisor (unknown at this time)
MPH Consulting Limited
Phone and fax numbers for camp will be provided when communication contract is finalized.

1.2 Purpose and Scope

The purpose of IronOne's Fuel Spill Contingency Plan is to provide a plan of action for any spill event during the Company's exploration programs in the Maguse River area of Nunavut. This Plan provides the protocol for responding to spills (or potential spills) that will minimize health and safety hazards, environmental damage and clean-up costs as well as defining responsibilities

of response personnel. This Fuel Spill Contingency Plan details the sites that operations will be conducted upon, describes the response organization, action plans, reporting procedures and training exercises in place.

1.3 IronOne Inc's Environmental Policy

IronOne is committed to the concept of sustainable development and the protection of the environment and human health. Company Unknown's environmental, health and safety policy is to:

- protecting employees, the public and the environment
- fully comply with all applicable legislation, regulations, and authorizations
- work proactively with federal, territorial and Aboriginal governments, other relevant organizations, and the general public, on all aspects of environmental protection
- anticipate future spill control requirements and make provision for them
- keep employees, contractors, Inspectors, Land and Water Boards, appropriate governments (Aboriginal, federal and territorial), and the public informed of any changes at the site or with project activities.

The plan will be is presented to all staff and contractors during their on-site orientation sessions. All employees and contractors will be made aware of the locations of the plan on the site at Maguse River and in the head office in Toronto.

All employees and contractors are shown where spill kits are stored, are aware of their contents and are trained in using spill equipment and responding to spills. The company is committed to keeping personnel up to date on the latest technologies and spill response methods.

1.4 Project Description

The Maguse River Camp of IronOne Inc. will be used as a base for a multi-year diamond drilling program on eleven Prospecting Permits, located approximately 40-90 km north and northwest of Arviat, Nunavut. Land Use and Water Licence applications are currently being applied for.

1.5 Site Description

1. Proposed Campsite, to be built and serviced by Eskimo Point Lumber.

(Coordinates 61°45.25' N by 93°59.25' W)

Capacity: maximum 22

Structures: Seven to ten 14' x 16' sleep tents
 One 14' x 32' kitchen tent
 One 14' x 16 coreshack
 One 14' x 16 core cutting tent
 Two 14' x 16' dry
 One 8' x 10' cooks/ first aid tent
 One 14' x 16' office tent
 Two latrines utilizing Pacto toilets
 One generator shack
 One steel shipping container (lockable)
 One heli-pad
 One incinerator
 One fuel cache with Spill Kit
 Spill response equipment located outside of coreshack

2. Drill Sites

Final drill targets have not been defined at this time. Drill site coordinates will be forwarded when known.

3. List of Hazardous Materials On-site

Hazardous Materials will be stored at the main campsite as well as at each drill site.

Campsite: Aviation, diesel and petroleum, to be stored in 45 gal (205 litre) drums.
 Diesel 175 drums
 Gasoline 10 drums
 Jet B 100 drums
 Propane 100 – 100 lb cylinders

These will be located a minimum of 31 metres from the normal high water mark and in such a manner that no fuel can enter any such water body. Smaller amounts of other hazardous materials such as petroleum products, oils/lubricants and cleaning products will be stored on-site at the Maguse River camp in a storage tent. Waste oil will be stored in empty containers in the fuel storage area and shipped out by plane for off-site disposal at an appropriate waste facility.

Drill Sites: 2-3 barrels of diesel fuel,
 One 100 lb propane cylinder
 Drill additives to be stored on each drill pad consecutively.
 Once drilling is complete in one area the fuel cache will be moved to a new location proximal to the next site of drill operations. All fuel will be located a minimum of 31 metres from normal high water mark and in such a manner that no fuel can enter any such water body.

1.4 Existing Preventative Measures

All hazardous materials will be carefully placed in fuel storage areas. The storage areas for diesel fuel, Jet B, gasoline and propane will be lined with “Insta Berm Arctic Shield” liners. Spill Kits will be located wherever fuel is stored or used. Portable drip trays and appropriately sized fuel transfer hoses with pumps are used when refuelling aircraft, ATVs, or other motorized equipment, to avoid any leaks/drips onto the land.

Note: Spill kits will be provided at each fuel cache, at each operational drill site and at the camp. The contents of a typical Spill Kit is listed in Appendix A.

2.0 RESPONSE ORGANIZATION

Camp Manager - responsible for checking fuel drum conditions and evidence of leakage daily, assuring drip trays are in place and not overflowing; keeping spill kits and absorbent mats in good repair and accessible. If spill or likelihood of a spill occurs the Manager will immediately report to the **Project Supervisor**.

Pilots and Drill Shift Boss to report spills or potential spills to the **Project Supervisor**.

Project Supervisor will report any spill to the NU/NT 24-Hour Spill Report Line and initiate cleanup. Project Supervisor will request additional aid from external sources if deemed necessary. Reportable spills must exceed the volumes outlined in Appendix B. Any spills less than these quantities do not need to be reported immediately to the spill reporting line. Rather, these minor spills will be tracked and documented by the company and submitted to the appropriate authority either immediately upon request or at a pre-determined reporting interval. If there is any doubt that the quantity spilled exceeds reportable levels, the spill will be reported to the NU/NT 24-Hour Spill Report Line.

The NT-NU Spill Report Form and Instructions are found in Appendix C.

If one or more of these key personnel are absent from the site an alternative person will be named as either Camp Manager or Project Supervisor in the interim.

Names of key personnel to be responsible for activating the spill contingency plan will be made available once crew members have been hired.

3.0 REPORTING PROCEDURE

Communication in the way of two-way radios will be set-up in the event that if a spill occurs outside of camp at either the drill rig or external fuel cache it can be immediately reported to the Project Supervisor.

All spill kits located at all sources of fuel will have contact information for the NU/NT Spill Report Line prominently displayed.

A listing of the NU/NT 24 Hour Spill Report Line as well as other government contacts and company officials will be displayed adjacent to the satellite phone in camp. (See Reporting Procedure and Contacts provided below).

SPILL REPORTING PROCEDURE

Fill, out "SPILL REPORT" form as completely as possible before making the report.
Report IMMEDIATELY using the 24-hour Spill Report Line

**24-HOUR SPILL REPORT LINE (867) 920-8130
AND TO
DIAND WATER RESOURCES INSPECTOR (867) 975-4298**

NOTE: Telephone calls can be made collect by informing the Operator that you wish to report a spill.

RCMP communications may be used if other means are not available.

Additional Information or Assistance:

Regulatory Bodies:

Department of Indian Affairs and
Northern Development
Yellowknife

Phone: (867) 920-8240

Environment Canada (Emergency)
Yellowknife

Phone: (867) 669-4725

Environment Canada
Iqaluit

Phone: (867) 975-4639
Emergency Pager: (867) 920-5131

Nunavut Water Board

Phone: (867) 360-6338
Fax: (867) 360-6369

Environmental Protection
Government of Nunavut

Fax: (867) 975-5981

Indian and Northern Affairs Canada

Phone: (867) 975-4550

Water Resources Manager
Nunavut Regional Office

Fax: (867) 975-4585

Indian and Northern Affairs Canada
Land Administration Minister
Nunavut Regional Office

Phone: (867) 975-4280

Fax: (867) 975-4286

Department of Fisheries and Oceans
Nunavut Regional Office
Manager Pollution Control & Air Quality

Phone: (867) 979-8000

Fax: (867) 979-8039

Phone: (867) 975-5907

RCMP Detachment
Yellowknife

Phone: (867) 669-5100

RCMP Detachment
Arviat

Phone: (867) 857-1111

Contractors:

Eskimo Point Lumber

Phone: (867) 857 2978

MPH Consulting Ltd.
Toronto

Phone: (416) 365-0930

Company Contact:

IronOne Inc.

Phone: (416) 643-3880

A detailed report on each occurrence must also be filed with the DIAND Water Resources Inspector no later than 30 days after initially reporting the event. The Spill Report Form is attached as Appendix B.

4.0 INITIAL ACTION

1.0 Stay alert and consider safety first. Identify the source of leak or spill and the type of product.

2.0 Assess the hazards to persons in the vicinity of the spill.

3.0 Isolate or remove any potential ignition source.

4.0 Control danger to human life if possible.

5.0 Assess whether the spill can be readily stopped or brought under control.

6.0 If safe (and possible) try to stop the flow.

7.0 Report the spill to the Project Supervisor and to the NU/NT 24-hour Spill Report Line at (867) 920-8130.

8.0 Initiate or resume clean up.

5.0 ACTION PLANS

The following responses are recommended for fuel spills in differing environments. Depending on the location and size of the exploration program some of the equipment mentioned in the responses listed below will obviously not be located on site but could be transported to the spill if deemed necessary. The most likely scenario for fuel spills in this type of exploration program would include; leaking drums, hydraulic line malfunction and re-fueling operations. It is not anticipated that a spill of more than 45 gallons will occur as no fuel container on-site will exceed this capacity.

5.1 Spills on Land (gravel, rock, soil and vegetation)

Trench or ditch to intercept or contain flow of fuel or petroleum products on land where feasible (loose sand, gravel and surface layers of organic materials are amenable to trenching/ditching-trenching in rocky substrates is typically impractical and impossible.)

Construct a soil berm downslope of the spill. Use of synthetic, impervious sheeting can also be used to act as a barrier.

Where available, recover spills through manual or mechanical means including shovels, heavy equipment and pumps.

Absorb petroleum residue with synthetic sorbent pad materials.

Recover spilled and contaminated material, including soil and vegetation.

Transport contaminated material to approved disposal or recovery site. Equipment used will depend on the magnitude and location of the spill.

Land based disposal is only authorized with the approval of government authorities.

5.2 Spills on Snow

Trench or ditch to intercept or contain flow of fuel or petroleum products on snow, where feasible (ice, snow, loose sand, gravel and surface layers of organic materials as

amenable to trench/ditching; trenching in solid, frozen ground or rocky substrates is typically impractical and impossible).

Compact snow around the outside perimeter of the spill area.

Construct a dike or dam out of snow, either manually with shovels or with heavy equipment such as graders and dozers where available.

If feasible, use synthetic liners to provide an impervious barrier at the spill site.

Locate the low point of the spill area and clear channels in the snow, directed away from waterways, to allow non-absorbed material to flow into the low point.

Once collected in the low area, options include shoveling spilled material into containers, picking up with mobile heavy equipment, pumping liquid into tanker trucks or using vacuum truck to pick up material.

Where safe, disposal can be done through in-situ combustion with approval from government and safety consultants.

Transport contaminated material to approved disposal site. Equipment used will depend on the magnitude and location of the spill.

5.3 Spills on Ice

Contain material spill using methods described above for snow, if feasible and/or mechanical recovery with heavy equipment.

Prevent fuel/petroleum products from penetrating ice and entering watercourses.

Remove contaminated material, including snow/ice as soon as possible.

Containment of fuel/petroleum products under ice surface is difficult given the ice thickness and winter conditions. However, if the materials get under ice, determine area where the fuel/petroleum product is located.

Drill holes through ice using ice auger to locate fuel/petroleum product.

Once detected, cut slots in the ice using chain saws and remove ice blocks.

Fuel/petroleum products collected in ice slots or holes can be picked up via suction hoses connected to portable pump, vacuum truck or standby tanker. Care should be taken to prevent the end of the suction hose clogging up by snow, ice or debris.

Fuel/petroleum products that have collected in ice slots may be disposed of by in-situ burning if sufficient holes are drilled in ice. Once all the holes are drilled, the oil which collects in the holes may be ignited. Consult with fire/safety consultants and government authorities to obtain approval.

5.4 Spills on Water

Contain spills on open water immediately to restrict the size and extent of the spill.

Fuel/petroleum products which float on water may be contained through the use of booms, absorbent materials, skimming and the erection of culvers.

Deploy containment booms to minimize spill area, although effectiveness of booms may be limited by wind, waves and other factors.

Use sorbent booms to slowly encircle and absorb spilled material. These absorbent are hydrophobic (absorb and repel water).

Once booms are secured, use skimmers to draw in hydrocarbons and minimal amounts of water. Skimmed material can be pumped through hoses to empty fuel tanks/drums.

Culverts permit water flow while capturing and collecting fuel along the surface with absorbent materials.

Chemical methods including dispersants, emulsion - treating agents and shoreline cleaning will be considered.

NOTE:

1. **Material Safety Data Sheets** for all hazardous materials involved in this project are listed in Appendix C. These MSDS sheets are for all drilling muds, polymers and greases as well as for diesel, propane and gasoline. Some of the products listed are not on site but are included in case these drilling additives are required in the event of poor ground conditions.

2. In-situ combustion is a disposal method available for fuels and petroleum products. In-situ burning can be initiated by using a large size portable propane torch (tiger torch) to ignite the fuel/petroleum products. Highly flammable products such as gasoline or alcohol, or combustible material such as wood, may be used to promote ignition of the spilled product. The objective is to raise the temperature for sustained combustion of the spilled product.

Precautions need to be taken to ensure safety of personnel. Also, spilled product should be confined to control burning. These include area where the spilled material has pooled naturally or been contained via dikes, trenches, depressions or ice slots. Prior to any attempts at in-situ burning, consultation with experts and approval by government authorities are required.

3. Chemical response methods are also available and may include the use of dispersants, Emulsions-treating agents, visco-elastic agents, herding agents, solidifiers, and shoreline cleaning agents.

4. Biological response methods include nutrient enrichment and natural microbe seeding.

5. Site remediation will be completed as per the advice of government authorities.

6.0 RESOURCE INVENTORY

Resources available on site:

Trenching/digging equipment in the form of picks and shovels.

Absorbent material (pads)

Pumps

Impervious sheeting (tarps)

Plastic bags, buckets, empty drums for collection of contaminated material.

Environmental Guideline for General Management of Hazardous Waste (Appendix D)

Resources available from other sources:

Larger pumps if necessary; Yellowknife, NT or Arviat or Rankin Inlet, NU

Bobcat/excavator; Yellowknife, NT or Arviat or Rankin Inlet NU

Contact: Eskimo Point Lumber

Phone: (867) 857-2978

7.0 TRAINING/EXERCISE

All contract personnel will be briefed and given a copy of the Fuel Spill Contingency Plan before field operations begin. Mock spill response exercises will be conducted early in the program to ensure response criteria, communication and reporting requirements are met and fully understood.

Appendix A

Spill Kit Contents

Appendix 1

#UYCSK 100 Spill Kit Contents

Contents:

1 x 32 Gal Yellow Poly container with lid, 35 x Sorbent Pads (17"x19") 12oz,
6 x Sorbent Pillows (8"x18"), 4 x Sorbent Socks (48"x 3"), 2 x Sorbent Socks (120"x 3"),
10 x Hand Wipes, 1 x 10lb Granular All Purpose Absorbent, 1 x Knife, 1 x Duct Tape,
2 x Dust Masks, 2 x prs. Green Nitrile Gloves, 2 x prs. Goggles,
1 x Neoprene Drain Cover 36"x36"x1/16", 1 x 4oz Epoxy Putty,
5 x Disposal Bags with ties, 1 x Instruction Sheet

Appendix B
Spill Report Form

Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and faxed to the spill line at 867-873-6924. Commencing on January 2, 2007, the form can also be 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. 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 overflow, 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 equipment: 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.

NT-NU Spill Report Form

  		NT-NU SPILL REPORT OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS		NT-NU 24-HOUR SPILL REPORT LINE TEL: (867) 920-8130 FAX: (867) 873-6924 EMAIL: spills@gov.nt.ca	
REPORT LINE USE ONLY					
A	REPORT DATE: MONTH – DAY – YEAR		REPORT TIME		☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT
B	OCCURRENCE DATE: MONTH – DAY – YEAR		OCCURRENCE TIME		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)		WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION			REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE DEGREES MINUTES SECONDS		LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER
H	SECOND PRODUCT SPILLED (IF APPLICABLE)		QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER
I	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS				
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130
LEAD AGENCY ☐ EC ☐ COG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC			SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN		FILE STATUS ☐ OPEN ☐ CLOSED
AGENCY		CONTACT NAME		CONTACT TIME	REMARKS
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

Appendix B-3:

Immediately Reportable Spill Quantities

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive Unknown substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas (i.e. contains H ₂ S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or sensitive wildlife habitat, poses imminent threat to human health or safety, poses imminent threat to a listed species at risk or its critical habitat, or is uncontrollable.

Appendix C

Material Safety Data Sheets

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,
Canada V4G 1L3
Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **WDS-120L**

PRODUCT USE: Drilling Mud Additives

CHEMICAL FAMILY: Copolymer of acrylamide with sodium acrylate

WHMIS CLASSIFICATION: B3, D2B

WORK PLACE HAZARD: Combustible liquid, skin and eye irritant

TRANSPORTATION OF DANGEROUS GOODS

SHIPPING NAME: not regulated

CLASSIFICATION: not applicable

PACKAGE GROUP: not applicable

PRODUCT IDENTIFICATION NUMBER (Pin): not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT %	CAS NUMBER	LD ₅₀ (oral rat)	LD ₅₀ (dermal rabbit)	LC ₅₀ (inhalator rat)
Mineral Spirits	30-60	64742-47-8	>5 g/kg	>3 g/kg	not determined
Alkyl Phenol	3-7	68412-54-4	3000 mg/kg	2830 mg/kg	not determined
Ethoxylate					

SECTION III: TOXICOLOGICAL INFORMATION

CARINOGENICITY: not determined

REPRODUCTIVE TOXICITY: not determined

TERATOGENICITY: not determined

MUTAGENICITY: not determined

DEVELOPMENTAL TOXICITY: not determined

SECTION IV: HEALTH HAZARDS

ROUTE OF ENTRY: [XXX] Skin [XXX] Eye Contact [XXX] Inhalation [XXX] Ingestion

THRESHOLD LIMIT VALUE: : not determined

SKIN CONTACT: : Contact may cause irritation, redness, swelling or dermatitis

EYE CONTACT: : Will cause painful burning or stinging of eyes and lids, watering of eyes and inflammation of conjunctiva.

INGESTION: : May cause nausea and vomiting.

INHALATION: : Inhalation not likely.

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,

Canada V4G 1L3

Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

WDS-120L

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SECTION V: FIRST AID MEASURES

SKIN CONTACT	: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE CONTACT	: Immediately flush eyes with water for 15 minutes and call a physician.
INGESTION	: Do not induce vomiting. If conscious, dilute by giving two glasses of water. Call a physician immediately.
INHALATION	: Remove to fresh air. If conscious, dilute by giving two glasses of water. Call a physician immediately.

SECTION VI: PHYSICAL DATA

APPEARANCE	Off white liquid
ODOUR	Mineral oil smell
SPECIFIC GRAVITY	1.07
BOILING POINT (0C)	not determined
MELTING POINT (0C)	not determined
SOLUBILITY IN WATER	Soluble
PERCENT VOLATILE BY VOLUME	not determined
EVAPORATION RATE	not determined
VAPOR PRESSURE (mm Hg)	not determined
VAPOR DENSITY (Air = 1)	not determined
pH	6 - 9 (0.6% in water)

SECTION VII: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	65°C (TCC)
FLAMMABLE LIMITS	not determined
EXTINGUISHING MEDIA	Water spray, foam, dry chemical, carbon dioxide
SPECIAL FIRE FIGHTING PROCEDURES	Self-contained respirators required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION HAZARDS	Water will cause extreme slipperiness. Sensitivity to static charge.

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,
Canada V4G 1L3
Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

WDS-120L

Page 3 of 3

SECTION VIII: REACTIVITY DATA

STABILITY:	[XXX] Stable	[] Unstable
INCOMPATIBILITY (Conditions to Avoid)	Strong oxidizing and reducing agents.	
CONDITIONS OF REACTIVITY	Not known	
HAZARDOUS DECOMPOSITION PRODUCTS	CO _x , smoke on combustion	
HAZARDOUS POLYMERIZATION	[XXX] Will not occur	[] Will occur

SECTION IX: PREVENTIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	In the absence of proper ventilation a NIOSH approved organic vapour respirator is recommended
VENTILATION	General mechanical, 10 changes per hour
PROTECTIVE GLOVES	Chemically resistant
EYE PROTECTION	Safety glasses
OTHER PROTECTIVE EQUIPMENT (Specify)	None known

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

(Use appropriate safety equipment.) Small spills, soak up with absorbent material
Large spills, dike to contain spill to prevent water pollution.
Recover diked material, return recovered material to plant.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid ingestion.
Practice reasonable caution and personal cleanliness.
Avoid skin and eye contact.
Store in a cool well ventilated area.

WASTE DISPOSAL METHOD

Absorb spilled material with absorbent compound, incinerate/dispose to conform with local disposal regulations.

SECTION X: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: July 2001
SUPERSEDES: January 1995
BY: Product Safety Committee

DATE REVISED: April 1, 2000
DATE REVISED: January 2002

Review date:

Authorized by:

March 31/03
Alan Leclerc

Material Safety Data Sheet / Fiche signalétique

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EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **SUPER POLY**
CHEMICAL FAMILY: Cellulose Ether
PRODUCT USE: Drilling Mud Additive.
WHMIS CLASSIFICATION: Not a Controlled Product under WHMIS
WORK PLACE HAZARD: Not applicable.

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not applicable.
PACKAGE GROUP: Not applicable.
PRODUCT IDENTIFICATION NUMBER (PIN): Not applicable.

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	LD50 LC50
No Hazardous Ingredients.			

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:

[] Skin, [] Eye Contact, [] Inhalation, [] Ingestion

SKIN CONTACT: May produce slight irritation with prolonged contact with moistened product.

EYE CONTACT: Dust may produce mechanical irritation.

INHALATION: Non-irritating to mucous membranes, however, breathing high concentrations of the dust may cause mechanical irritation of the nose, throat and upper respiratory tract.

INGESTION: Passes through relatively inert. May cause gastro intestinal upset. Oral LD50 > 25 g/kg (rats).

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Wash exposed area with soap and water. If irritation develops seek medical attention.

EYE CONTACT: Flush eyes with running water for at least fifteen (15) minutes. If illness or adverse symptoms develop, seek medical attention.

INHALATION: Remove from exposure. If illness or adverse symptoms develop, seek medical attention.

INGESTION: Give two (2) glasses of water and induce vomiting. If illness or adverse symptoms develop, seek medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOR: Light colored powder; Odorless.

DENSITY (SPECIFIC GRAVITY): 1.6

BOILING POINT: Not applicable

MELTING POINT: Not applicable

WATER SOLUBILITY: Complete

% VOLATILE BY VOLUME: Negligible

EVAPORATION RATE: Not applicable

VAPOR PRESSURE: (mm Hg) Not applicable

VAPOR DENSITY: (Air = 1) Not applicable

**WESTCOAST DRILLING SUPPLIES LTD.**

8069 River Way, Delta, British Columbia, Canada V4G 1L3

Phone: (604) 940-6050 · Fax: (604) 940-6080

Toll Free: 1-800-665-6645

SUPER POLY

Page 2 of 2

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Not applicable
FLAMMABLE LIMIT: Not determined
EXTINGUISHING MEDIA: Water, water fog, chemical, carbon dioxide CO₂.
SPECIAL FIRE FIGHTING PROCEDURES: Evacuate area of all necessary personnel. Use self-contained respirators for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION HAZARDS: If in a finely divided and suspended state, treat as a flammable dust. Material becomes very slippery when contacted with water.

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE []
INCOMPATIBILITY (CONDITIONS TO AVOID): Strong oxidizing and caustic solutions.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION: Will not occur [XXX] May occur []

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION: Suggest dust mask. Nuisance dust.
VENTILATION: No special requirements.
PROTECTIVE GLOVES: None required.
EYE PROTECTION: Suggest goggles, nuisance dust.
OTHER PROTECTIVE EQUIPMENT: None required.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Avoid ingestion. Practice reasonable caution and personal cleanliness. Avoid skin and eye contact. Material become slippery when wet.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:

Vacuum or sweep-up if dry. If wet, pick up with dry material such as sand or dirt. Avoid flushing with water as material becomes slippery.

WASTE DISPOSAL METHOD:

Dispose of material in accordance with local ordinances. Landfill suggested.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: February 20, 1989

BY: Product Safety Committee

DATE REVISED: April 1, 2000

Review date:

Authorized by:

March 31/03
Alan Lalonde



Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	Not controlled		

Section 1. Chemical Product and Company Identification

Product Name	DURON* SINGLE GRADE OILS SAE VISCOSITY GRADES 10W, 20, 30, 40, 50	Code	420-054, DUR1 420-055, DUR2 420-056, DUR3 420-057, DUR4 420-058, DUR5
Synonym	Not available	Validated on	11/6/2001.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	DURON* single grade oils are intended for use in diesel and spark ignition engines according to the specific viscosity grade and performance level for each grade of product. They may also be used for wet clutch and gear type transmissions and hydraulic systems in line with equipment builder specifications.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (W/W)	TLV-TWA(8 h)	STEL	CEILING
1) Severely hydrotreated paraffinic oil and additives.	Mixture	100	5 mg/m ³ (oil mist)	10 mg/m ³ (oil mist)	Not established
Manufacturer Recommendation	Not applicable				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification.

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.
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Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	May be combustible at high temperature.	Flammable Limits	Not available.
Flash Points	CLOSED CUP: $\geq 195^{\circ}\text{C}$ (383°F) (Pensky-Martens) OPEN CUP: $\geq 215^{\circ}\text{C}$ (419°F) (Cleveland)	Auto-Ignition Temperature	Fire Point: $\geq 235^{\circ}\text{C}$ (455°F)
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.
Products of Combustion	Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), smoke and irritating vapours as products of incomplete combustion.		

Fire Fighting Media and Instructions	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. SMALL FIRE: use DRY chemicals, foam, water spray or CO ₂ . LARGE FIRE: use water spray, fog or foam. 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.
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Section 6. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 171, Substances (low to moderate hazard). ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if 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 used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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Section 7. Handling and Storage

Handling	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.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection -	<i>The selection of personal protective equipment varies, depending upon conditions of use.</i>
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.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) 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.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid.	Viscosity	10W: 40 cSt @ 40°C (104°F) 20: 65 cSt @ 40°C (104°F) 30: 83 cSt @ 40°C (104°F) 40: 131 cSt @ 40°C (104°F) 50: 209 cSt @ 40°C (104°F)
Colour	Amber.	Pour Point	10W: -42°C 20: -39°C 30: -36°C 40: -30°C 50: -21°C
Odour	Mild petroleum oil like.	Softening Point	Not applicable.
Odour Threshold	Not available.	Dropping Point	Not applicable.
Boiling Point	Not available.	Penetration	Not applicable.
Density	0.8604 to 0.8881 kg/L @ 15°C (59°F).	Oil / Water Dist. Coefficient	Not available
Vapour Density	Not available.	Ionicity (in water)	Not available
Vapour Pressure	Negligible at ambient temperature and pressure.	Dispersion Properties	Not available
Volatility	Non-volatile.	Solubility	Insoluble in water.

Section 10. Stability and Reactivity

Corrosivity	30, 40: Copper corrosion, 3h, 100°C (ASTM D0130): 1b. 10W, 20, 50: Copper corrosion, 3h, 100°C (ASTM D0130): 1a.		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents, acids, halogens and halogen compounds.	Decomposition Products	May release COx, SOx, H2S, CaOx, ZnOx, alkyl mercaptans, sulfides, aldehydes, methacrylate monomers, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.		
Acute Lethality	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).		
Chronic or Other Toxic Effects	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 give 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 12. Ecological Information

Environmental Fate	Not available	Persistence/ Bioaccumulation Potential	Not available
BOD5 and COD	Not available.	Products of Biodegradation	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/used/waste 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.
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Section 14. Transport Information

TDG Classification	Not controlled under TDG (Canada).	Special Provisions for Transport	Not applicable.
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Section 15. Regulatory Information

Other Regulations		This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).												
		All components of this formulation are listed on the US EPA-TSCA Inventory.												
		All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).												
		This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.												
		Please contact Product Safety for more information.												
DSD/DPD (Europe)		Not classified under the Dangerous Substances or Dangerous Preparations Directives.		HCS (U.S.A.) Not controlled under the HCS (United States).										
ADR (Europe) (Pictograms)				DOT (U.S.A) (Pictograms) 										
HMIS (U.S.A.)		<table><tr><td>Health Hazard</td><td>1</td></tr><tr><td>Fire Hazard</td><td>1</td></tr><tr><td>Reactivity</td><td>0</td></tr><tr><td>Personal Protection</td><td>B</td></tr></table>		Health Hazard	1	Fire Hazard	1	Reactivity	0	Personal Protection	B	NFPA (U.S.A.) Health  Fire Hazard Reactivity Specific hazard		Rating 0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme
Health Hazard	1													
Fire Hazard	1													
Reactivity	0													
Personal Protection	B													

Section 16. Other Information

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

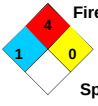
ACGIH - American Conference of Governmental Industrial Hygienists ADR - Agreement on Dangerous goods by Road (Europe) ASTM - American Society for Testing and Materials () BOD5 - Biological Oxygen Demand in 5 days CAN/CGA B149.2 Propane Installation Code CAS - Chemical Abstract Services CEPA - Canadian Environmental Protection Act CERCLA - Comprehensive Environmental Response, Compensation and Liability Act CFR - Code of Federal Regulations CHIP - Chemicals Hazard Information and Packaging Approved Supply List COD5 - Chemical Oxygen Demand in 5 days CPR - Controlled Products Regulations DOT - Department of Transport DSCL - Dangerous Substances Classification and Labeling (Europe) DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe) DSL - Domestic Substance List EEC/EU - European Economic Community/European Union EINECS - European Inventory of Existing Commercial Chemical Substances EPCRA - Emergency Planning and Community Right to Know Act FDA - Food and Drug Administration FIFRA - Federal Insecticide, Fungicide and Rodenticide Act HCS - Hazardous Communication System HMIS - Hazardous Material Information System IARC - International Agency for Research on Cancer	IRIS - Integrated Risk Information System LD50/LC50 - Lethal Dose/Concentration kill 50% LDLo/LCLo - Lowest Published Lethal Dose/Concentration NAERG'96 - North American Emergency Response Guide Book (1996) NFPA - National Fire Prevention Association NIOSH - National Institute for Occupational Safety & Health NPRI - National Pollutant Release Inventory NSNR - New Substances Notification Regulations (Canada) NTP - National Toxicology Program OSHA - Occupational Safety & Health Administration PEL - Permissible Exposure Limit RCRA - Resource Conservation and Recovery Act SARA - Superfund Amendments and Reorganization Act SD - Single Dose STEL - Short Term Exposure Limit (15 minutes) TDG - Transportation Dangerous Goods (Canada) TDLo/TCLo - Lowest Published Toxic Dose/Concentration TLM - Median Tolerance Limit TLV-TWA - Threshold Limit Value-Time Weighted Average TSCA - Toxic Substances Control Act USEPA - United States Environmental Protection Agency USP - United States Pharmacopoeia WHMIS - Workplace Hazardous Material Information System
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For Copy of MSDS Lubricants: Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564 Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285 Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285 For Product Safety Information: (905) 804-4752	Prepared by Product Safety - TAR on 11/6/2001. Data entry by Product Safety - JDW.
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To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

NFPA	HMIS (U.S.A.)	Rating	Protective Clothing	DOT (pictograms)
 Health	Health Hazard (1*) Fire Hazard (4) Reactivity (0) Personal Protection (H)	0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme		

Section I. Chemical Product and Company Identification

Product Name	PROPANE	Code	W222 SAP: 169
Synonym	Propane HD-5, Propane commercial, Liquefied Petroleum Gas (LPG), C3H8, CGSB Propane Grade 1, CGSB Propane Grade 2, odourized propane, stench propane.	DSL	On the DSL.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	TSCA	On TSCA list.
Material Uses	Propane is used as a fuel gas, refrigerant and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks.	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

Section II. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (V/V)	TLV-TWA(8 h)	STEL	CEILING
1) HD-5 Propane Propane Propene	74-98-6 115-07-1	>90 <5	2500 ppm Simple Asphyxiant	Not established Not established	Not established Not established
2) Commercial Propane Propane Propene	74-98-6 115-07-1	>75 <20	2500 ppm Simple Asphyxiant	Not established Not established	Not established Not established
3) Both grades may contain: Ethane Butane +	74-84-0 106-97-8	<6 <5	Simple Asphyxiant 800 ppm	Not established Not established	Not established Not established
Manufacturer	Not applicable				
Recommendation					
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section III. Hazards Identification.

Potential Health Effects	Contact with gas or liquefied gas may cause burns and frostbite. Propane may displace oxygen and cause asphyxiation. Inhalation of vapours can cause irritation of respiratory tract and can cause CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconsciousness and possibly death. Ingestion is not an expected route of exposure. For more information, refer to Section 11.
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Section IV. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section V. Fire-fighting Measures

Flammability	Class I - flammable gas (NFPA).	Flammable Limits	Lower: 2.1%; Upper: 9.5%, (NFPA).
Flash Points	CLOSED CUP: -104°C (-155°F).	Auto-Ignition Temperature	450°C (842°F), (NFPA).

Continued on Next Page

Available in French

Fire Hazards in Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapours may generate static charge causing ignition. May accumulate in confined spaces.	Explosion Hazards in Presence of Various Substances	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapour explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.
Products of Combustion	Carbon oxides (CO, CO ₂), smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 115, Flammable Gas: CAUTION: This product has a low flash point, use of water spray when fighting fire may be inefficient. SMALL FIRE: Use DRY chemicals, CO ₂ , water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions. DO NOT extinguish a leaking gas flame unless leak can be stopped. Shut off fuel to fire if it is possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Withdraw immediately in case of rising sound from venting safety device or any discolouration of tank due to fire. Cool containing vessels with water spray in order to prevent pressure build-up, autoignition or explosion. Self-contained breathing apparatus (SCBA) will be required if approaching the fire from downwind, or to enter enclosed areas or buildings. Handle damaged cylinders with extreme care.		

Section VI. Accidental Release Measures

Material Release or Spill	NAERG96, Guide 115, Flammable gas. ELIMINATE ALL IGNITION SOURCES. Ventilate closed spaces before entering. Avoid contact, fully-encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. Stop leak if without risk. By forced ventilation, maintain concentration of gas below the range of explosive mixture. Remove the leaking container to an open area and allow it to bleed off into the atmosphere. Use water spray to reduce vapours; isolate area until gas has dispersed. For spill or leak: isolate in all directions at least 50 to 100 meters (160 to 330 feet), then evacuate in a downwind direction for at least 800 meters (0.5 miles). Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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Section VII. Handling and Storage

Handling	Keep away from heat, spark, open flames and other sources of ignition. Ground/bond line and equipment during pumping or transfer to avoid accumulation of static charge. Rapid escape of vapour may generate static charge causing ignition. Empty container may contain flammable/explosive residues or vapours, DO NOT reuse empty containers without commercial cleaning or reconditioning. Use spark-proof electrical equipment.
Storage	Compressed gases should be stored in a separate safety storage cabinet or room. Do not store near sources of heat or ignition. Some of the components of this gas can attack some forms of plastic, rubber and coatings. Keep away from incompatibles. Ground all equipment containing material.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection -	<i>The selection of personal protective equipment varies, depending upon conditions of use.</i>
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.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) 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.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section IX. Physical and Chemical Properties

Physical State and Appearance	Gas at room temperature; liquid when stored under pressure.	Viscosity	Not applicable.
Colour	Colourless.	Pour Point	Not applicable.
Odour	Propane is an odourless gas. Odourized propane will contain up to 28 g ethyl mercaptan per 1000 L of propane.	Softening Point	Not applicable.
Odour Threshold	Odour is not an adequate warning to prevent overexposure to propane. Prolonged exposure to mercaptans can cause olfactory desensitization.	Dropping Point	Not applicable.
Boiling Point	-42°C (-44°F)	Penetration	Not applicable.
Density	508 kg/m ³ @ 15°C (59°F)	Oil / Water Dist. Coeff.	Not available
Vapour Density	1.56 (air=1)	Ionicity (in water)	Not available

PROPANE		Page Number: 3	
Vapour Pressure	<10763 mmHg @ 100°F (<1435 kPa @ 38°C).	Dispersion Properties	Not available
Volatility	Volatile	Solubility	Slightly soluble in water.

Section X. Stability and Reactivity			
Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents.	Decomposition Products	May release COx, smoke and irritating vapours when heated to decomposition.

Section XI. Toxicological Information	
Routes of Entry	Inhalation, skin contact and eye contact.
Acute Lethality	Propene: Acute inhalation toxicity (LC50): >50000 ppm/4h (rat). Butane: Acute inhalation toxicity (LC50): 202000 ppm/4h (mouse).
Chronic or Other Toxic Effects	
Dermal Route:	Contact with liquified gas can cause frostbite.
Inhalation Route:	Propane may displace oxygen and cause asphyxiation. Inhalation of vapours can cause CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconsciousness and possibly death. Inhalation can also cause irritation of nose, throat and respiratory tract.
Oral Route:	Ingestion is not an applicable route of exposure for gases.
Eye Irritation/Inflammation:	Contact with liquified gas can cause frostbite.
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:	This product is not expected to be a mutagen, based on the available data and the known hazards of the components.
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 XII. Ecological Information			
Environmental Fate	Not available	Persistence/Bioaccumulation Potential	Not available
BOD5 and COD	Not available	Products of Biodegradation	Not available
Additional Remarks	No additional remark.		

Section XIII. Disposal Considerations	
Waste Disposal	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. Consult your local or regional authorities.

Section XIV. Transport Information

DOT Classification	Propane UN1978 2.1	Special Provisions for Transport	Not applicable.
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Section XV. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). All components of this formulation are listed on the US EPA-TSCA Inventory. All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. Please contact Product Safety for more information.		
DSD/DPD (EEC)	Not evaluated.	WHMIS (Canada)	A, B-1
ADR (Europe) (Pictograms)		TDG (Canada) (Pictograms)	

Section XVI. Other Information

References	Available upon request. * Marque de commerce de Petro-Canada - Trademark		
Glossary	ACGIH - American Conference of Governmental Industrial Hygienists ADR - Agreement on Dangerous goods by Road (Europe) ASTM - American Society for Testing and Materials (BOD5 - Biological Oxygen Demand in 5 days CAN/CGA B149.2 Propane Installation Code CAS - Chemical Abstract Services CEPA - Canadian Environmental Protection Act CERCLA - Comprehensive Environmental Response, Compensation and Liability Act CFR - Code of Federal Regulations CHIP - Chemicals Hazard Information and Packaging Approved Supply List COD5 - Chemical Oxygen Demand in 5 days CPR - Controlled Products Regulations DOT - Department of Transport DSCL - Dangerous Substances Classification and Labeling (Europe) DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe) DSL - Domestic Substance List EEC/EU - European Economic Community/European Union EINECS - European Inventory of Existing Commercial Chemical Substances EPCRA - Emergency Planning and Community Right to Know Act FDA - Food and Drug Administration FIFRA - Federal Insecticide, Fungicide and Rodenticide Act HCS - Hazardous Communication System HMIS - Hazardous Material Information System IARC - International Agency for Research on Cancer IRIS - Integrated Risk Information System LD50/LC50 - Lethal Dose/Concentration kill 50% LDLo/LCLo - Lowest Published Lethal Dose/Concentration NAERG'96 - North American Emergency Response Guide Book (1996) NFPA - National Fire Prevention Association NIOSH - National Institute for Occupational Safety & Health NPRI - National Pollutant Release Inventory NSNR - New Substances Notification Regulations (Canada) NTP - National Toxicology Program OSHA - Occupational Safety & Health Administration PEL - Permissible Exposure Limit RCRA - Resource Conservation and Recovery Act SARA - Superfund Amendments and Reorganization Act SD - Single Dose STEL - Short Term Exposure Limit (15 minutes) TDG - Transportation Dangerous Goods (Canada) TDLo/TCLo - Lowest Published Toxic Dose/Concentration TLM - Median Tolerance Limit TLV-TWA - Threshold Limit Value-Time Weighted Average TSCA - Toxic Substances Control Act USEPA - United States Environmental Protection Agency USP - United States Pharmacopoeia WHMIS - Workplace Hazardous Material Information System		
For Copy of MSDS Fuels & Solvents: Western Canada, telephone: 403-296-4158; fax: 403-296-6551 Ontario & Central Canada, telephone: 1-800-668-0220; fax: 1-800-837-1228 Quebec & Eastern Canada, telephone: 514-640-8308; fax: 514-640-8385 For Product Safety Information: (905) 804-4752	Prepared by Product Safety - TAR on 8/10/2001.		
	Data entry by Product Safety - JDW.		

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

Material Safety Data Sheet / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.
8069 River Way, Delta, British Columbia,
Canada V4G 1L3
Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **PELADOW®**
PRODUCT USE: Oil Well Fluid Additive
CHEMICAL FAMILY: Calcium Chloride (>90%)

WORK PLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

WHMIS CLASSIFICATION: Class D-2(B)
WORK PLACE HAZARD: Skin and Eye Irritant

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

SHIPPING NAME: Not Regulated Under TDG
TDG CLASSIFICATION: Not applicable
PACKAGE GROUP: Not applicable
PRODUCT IDENTIFICATION NUMBER (PIN): Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	LD50 (oral rat)
Calcium Chloride	91 - 92%	10043-52-4	900-2100 mg / kg (100%)
Sodium Chloride	1 - 2%	7647-14-5	Not available
Potassium Chloride	2-3%	7447-40-7	Not available
Strontium Chloride	1%	10476-85-4	Not available

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:
[XX] Skin, [XX] Eye Contact, [XX] Inhalation, [XX] Ingestion

EYE CONTACT: Dusts may cause moderate to severe eye irritation. with corneal injury that may be slow to heal. When dissolving, the heat produced may cause more intense effects as well as thermal burns.

SKIN CONTACT: Short single exposure not likely to cause significant skin irritation. Prolonged or repeated exposure may cause skin irritation, even a burn. May cause more severe response if skin is damp and/or abraded, or if material is confined to skin. When dissolving, the heat produced may cause more intense effects as well as thermal burns.
DOT classification: Noncorrosive.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts. The LD₅₀ for skin absorption in rabbits is >5000 mg / kg.

INGESTION: Single dose oral toxicity is low. Swallowing solids may cause gastro-intestinal irritation or ulceration.

INHALATION: Vapours are unlikely due to physical properties. Dust may cause irritation of upper respiratory tract.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Immediately wash skin with lots of soap and water. Remove contaminated clothing and shoes; wash before reuses. Get medical attention if irritation persists after washing.

EYE CONTACT: *Get immediate medical attention.* Immediately flush eyes with lots of running water for 15 minutes, lifting the upper and lower eyelids occasionally.

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INGESTION: If conscious, immediately induce vomiting. *Get immediate medical attention. Do not give anything by mouth to an unconscious or convulsing person.*

INHALATION: remove to fresh air. Give artificial respiration if not breathing. *Get immediate medical attention.*

NOTE TO PHYSICIAN: If burn is present, treat as any thermal burn, after decontamination, No specific antidote. Supportive care. Treatment based on judgement of the physician in response to reactions of patient.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOR:	White to off-white powder; odorless.
DENSITY (SPECIFIC GRAVITY):	2.2 g/cc
BOILING POINT:	198° C
MELTING POINT:	Approximately 230° C
WATER SOLUBILITY:	Soluble pH 7-10
% VOLATILE BY VOLUME:	Not applicable
EVAPORATION RATE:	Not applicable
VAPOR PRESSURE: (mm Hg)	0.009 mm Hg 20° C
VAPOR DENSITY: (Air = 1)	Not applicable

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable
FLAMMABLE LIMIT:	Not applicable
EXTINGUISHING MEDIA:	This material is not combustible
SPECIAL FIRE FIGHTING PROCEDURES:	Self-contained respirators required for fire-fighting personnel
UNUSUAL FIRE AND EXPLOSION HAZARDS:	None

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE []

INCOMPATIBILITY (CONDITIONS TO AVOID): (Specific Materials to Avoid) Calcium Chloride will: corrode most metals exposed to air, attack aluminium (and its alloys) and yellow brass; react with sulphuric acid to form hydrogen chloride which is corrosive, irritating, and reactive; give an exothermic reaction with water-reactive materials such as sodium; result in a runaway polymerization reaction with methyl vinyl ether (Bretherick, 1979); and, in solution form react with zinc (galvanizing) to yield hydrogen gas which is explosive (Ibid.). (Bretherick, L. 1979, Handbook of Reactive Chemical Hazards, 2nd Ed.)

HAZARDOUS DECOMPOSITION PRODUCTS: Not Applicable

HAZARDOUS POLYMERIZATION: Will not occur [XX] May occur []

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION:	Approved dust respirator mask
VENTILATION:	Local mechanical exhaust
PROTECTIVE GLOVES:	Rubber gloves.
EYE PROTECTION:	Chemical goggles.
OTHER PROTECTIVE EQUIPMENT:	An eyewash and safety shower should be nearby and ready for use.

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Avoid eye and prolonged skin contact, Always use cool water (temperature less than 27° C), when dissolving calcium chloride. Heat developed by solutions is very high during dissolving and mixing. When exposed to atmosphere, calcium chloride will pick up water and form a solution. Leather clothing and shoes will be damaged by calcium chloride.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:

Losses incidental to correct applications of this product in its intended uses are not expected to be harmful to the environment. Wear appropriate safety apparel during clean-up. Avoid entry of large amount of product into sewers, natural waters, and drinking water sources. Due to possible harmful effects. Avoid contact with vegetation, animals and fish life. Recover quickly into suitable, dry sealable containers if reusing. Small quantities may be flushed away with plenty of water. Walking surfaces may remain wet longer due to moisture being held by spilled product - avoid by thoroughly water washing surfaces.

WASTE DISPOSAL METHOD:

Dispose of contaminated product and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate regulatory agencies to ascertain proper disposal procedures

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: December 15, 1994

BY: Product Safety Committee

DATE REVISED: April 1, 2000

Review date: March 31/03

Authorized by: Alan Blanche

Material Safety Data / Fiche signalétique

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SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **LUBTUB**

CHEMICAL FAMILY: Sodium polyacrylate
PRODUCT USE: Drilling fluid additive
WHMIS CLASSIFICATION: D2B
WORK PLACE HAZARD: Skin and eye irritant

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not dangerous goods
PACKAGE GROUP: Not applicable
PRODUCT IDENTIFICATION NUMBER (Pin): Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENTS	PERCENT(%)	CAS#	LD ₅₀ (oral rat)	LD ₅₀ (dermal rabbit)	LC ₅₀ (inhalation rat)
Sodium salt of polyacrylic	15-40	9003-04-7	not determined	not determined	not determined

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY	[XXX] Skin	[XXX] Eye Contact	[XXX] Inhalation	[XXX] Ingestion
THRESHOLD LIMIT VALUE	Not determined			
SKIN CONTACT	Prolonged contact may cause skin irritation or dermatitis in some individuals.			
EYE CONTACT	May cause watering of eyes and inflammation of conjunctiva			
INGESTION	May cause nausea and vomiting.			
INHALATION	If misted, may cause sneezing, slight irritation of nose and throat.			

SECTION IV: TOXICOLOGICAL INFORMATION

CARCINOGENICITY	not determined
REPRODUCTIVE TOXICITY	not determined
TERATOGENICITY	not determined
MUTAGENICITY	not determined
DEVELOPMENTAL TOXICITY	not determined

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SECTION V: FIRST AID MEASURES

SKIN CONTACT:	Wash exposed area with soap and water. If irritation or abnormalities persist, seek medical attention.
EYE CONTACT:	Immediately flush eyes with water for 15 minutes and seek medical attention. Contact lenses should not be worn when working with this material.
INGESTION:	If victim is conscious and alert induce vomiting by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Seek medical attention.
INHALATION:	Remove to fresh air, if not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention.

SECTION VI: PHYSICAL DATA

APPEARANCE	Clear to hazy light amber liquid
ODOR	Sweet odour
SPECIFIC GRAVITY	1.1
BOILING POINT (°C)	not determined
MELTING POINT (°C)	not determined
SOLUBILITY IN WATER	Miscible
PERCENT VOLATILE BY VOLUME	not determined
EVAPORATION RATE	not determined
VAPOR PRESSURE (mm Hg)	not determined
VAPOR DENSITY (Air = 1)	not determined
pH	6 - 8

SECTION VII: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	>100 °C (TCC)
FLAMMABLE LIMITS	not determined
EXTINGUISHING MEDIA	CO ₂ , Foam, dry chemical, water spray
SPECIAL FIRE FIGHTING PROCEDURES	Use full protective equipment and self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS	Though the product is not flammable, evaporation of sufficient quantities of material could render the product combustible.

SECTION VIII: REACTIVITY DATA

STABILITY	[XXX] Stable	[] Unstable
INCOMPATIBILITY (Conditions to avoid)	Strong oxidizers	
CONDITIONS OF REACTIVITY	None known	
HAZARDOUS DECOMPOSITION PRODUCTS	CO _x and smoke on combustion	
HAZARDOUS POLYMERIZATION	[XXX] Will not occur	[] May occur

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SECTION IX: PREVENTIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Use NIOSH approved cartridge respirator when exposure is likely to be excessive.

VENTILATION

General mechanical

PROTECTIVE GLOVES

Chemically resistant

EYE PROTECTION

Safety glasses

OTHER PROTECTIVE EQUIPMENT (Specify)

None known

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLE OR RELEASED

(Use appropriate safety equipment.) Small spills, soak up with absorbent material.

Large spills, dike to contain spill to prevent water pollution.

Recover diked material, return recovered material to plant.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid ingestion.

Practice reasonable caution and personal cleanliness.

Avoid skin and eye contact.

Store in a cool well ventilated area.

WASTE DISPOSAL METHOD

Absorb spilled material with absorbent compound, incinerated/dispose to conform with local disposal regulations.

SECTION X: PREPARATION

THE INFORMATION CONTAINED HERIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY, EXPRESSED OR IMPLIED IS MADE.

DATE ISSUED: November 10, 1990

SUPERSEDES: April 1997

BY: Product Safety Committee

DATE REVISED: April 1, 2000

DATE REVISED: January 2002

Review date:

March 31/03

Authorized by:

Alan Lalonde



Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	Not controlled		

Section 1. Chemical Product and Company Identification

Product Name	SUPREME LO-TEMP GREASE	Code	650-412; SPEMLO
Synonym	Not available	DSL	See Section 15
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	TSCA	See Section 15
Material Uses	This product is a premium quality, multipurpose grease used for transportation, mining, and general industrial applications.	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (W/W)	TLV-TWA(8 h)	STEL	CEILING
1) Mixture of severely hydrotreated and hydrocracked, and/or solvent-refined base oil (petroleum) and other proprietary, non-hazardous additives.	Mixture	100	5 mg/m ³ (oil mist)	10 mg/m ³ (oil mist)	Not established

Section 3. Hazards Identification.

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.
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Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. High pressure grease gun is capable of injecting grease through the skin. Grease gun injuries require immediate physician assessment. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	May be combustible at high temperature.	Flammable Limits	Not available
Flash Points	Mineral Oil Blend: OPEN CUP: 242°C (467.6°F) (Cleveland)	Auto-Ignition Temperature	Mineral Oil Blend: Fire Point: 260°C (500°F)
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.
Products of Combustion	Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), sulphur compounds (H ₂ S), metallic oxides, hydrocarbons, smoke and irritating vapours as products of incomplete combustion.		
Fire Fighting Media and Instructions	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. SMALL FIRE: use DRY chemicals, foam, water spray or CO ₂ . LARGE FIRE: use water spray, fog or foam. 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.		

Section 6. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 171, Substances (low to moderate hazard). ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if 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 used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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Section 7. Handling and Storage

Handling	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.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection -	<i>The selection of personal protective equipment varies, depending upon conditions of use.</i>
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.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) 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.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.
Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits. This product is not expected to form a mist based on its properties and expected use.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Buttery, smooth semi-solid	Viscosity	Mineral Oil Blend: 71.9 cSt @ 40°C (104°F), 9.1 cSt @ 100°C (212°F), VI=100
Colour	Amber.	Pour Point	Mineral Oil Blend: -18°C (0°F)
Odour	Mild grease like.	Softening Point	Not available
Odour Threshold	Not available	Dropping Point	258°C (496°F)
Boiling Point	Not available	Penetration	355 (60 strokes)
Specific Gravity	Mineral Oil Blend: 0.8652 kg/L @ 15°C (59°F).	Oil / Water Dist. Coeff.	Not available
Vapor Density	Not available	Ionicity (in water)	Not available
Vapor Pressure	Negligible at ambient temperature and pressure.	Dispersion Properties	Not available
Volatility	Non-volatile.	Solubility	Insoluble in water.

Section 10. Stability and Reactivity

Corrosivity	Not corrosive to copper or steel.		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents, acids, alkalis, peroxides, oxidizing chlorine, oxidizing bromine and chromic acid.	Decomposition Products	May release COx, NOx, SOx, H2S, POx, CaOx, H2O, AlOx, isopropyl alcohol, diphenylamine, alkenes, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.
Acute Lethality	Based on toxicity of components. Acute oral toxicity (LD50): >5000 mg/kg (rat). Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).
Chronic or Other Toxic Effects	
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 give 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 12. Ecological Information

Environmental Fate	Not available	Persistence/ Bioaccumulation Potential	Not available
BOD5 and COD	Not available	Products of Biodegradation	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/used/waste oil may meet the requirements of a hazardous waste. 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. Consult your local or regional authorities.
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Section 14. Transport Information

TDG Classification	Not controlled under TDG (Canada).	Special Provisions for Transport	Not applicable.
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Section 15. Regulatory Information**Other Regulations**

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

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

All components of this formulation are listed on EINECS or exempt.

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

Please contact Product Safety for more information.

DSD/DPD (Europe) Not classified under the Dangerous Substances or Dangerous Preparations Directives.

DSD/DPD (Europe) (Pictograms)**DOT (U.S.A) (Pictograms)****HMIS (U.S.A.)**

Health Hazard	1
Fire Hazard	1
Reactivity	0
Personal Protection	B

NFPA (U.S.A.)**Section 16. Other Information****References**

Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
 ADR - Agreement on Dangerous goods by Road (Europe)
 ASTM - American Society for Testing and Materials ()
 BOD5 - Biological Oxygen Demand in 5 days
 CAN/CGA B149.2 Propane Installation Code
 CAS - Chemical Abstract Services
 CEPA - Canadian Environmental Protection Act
 CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
 CFR - Code of Federal Regulations
 CHIP - Chemicals Hazard Information and Packaging Approved Supply List
 COD5 - Chemical Oxygen Demand in 5 days
 CPR - Controlled Products Regulations
 DOT - Department of Transport
 DSCCL - Dangerous Substances Classification and Labeling (Europe)
 DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
 DSL - Domestic Substance List
 EEC/EU - European Economic Community/European Union
 EINECS - European Inventory of Existing Commercial Chemical Substances
 EPCRA - Emergency Planning and Community Right to Know Act
 FDA - Food and Drug Administration
 FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
 HCS - Hazardous Communication System
 HMIS - Hazardous Material Information System
 IARC - International Agency for Research on Cancer

IRIS - Integrated Risk Information System
 LD50/LC50 - Lethal Dose/Concentration kill 50%
 LDLo/LCLo - Lowest Published Lethal Dose/Concentration
 NAERG'96 - North American Emergency Response Guide Book (1996)
 NFPA - National Fire Prevention Association
 NIOSH - National Institute for Occupational Safety & Health
 NPRI - National Pollutant Release Inventory
 NSNR - New Substances Notification Regulations (Canada)
 NTP - National Toxicology Program
 OSHA - Occupational Safety & Health Administration
 PEL - Permissible Exposure Limit
 RCRA - Resource Conservation and Recovery Act
 SARA - Superfund Amendments and Reorganization Act
 SD - Single Dose
 STEL - Short Term Exposure Limit (15 minutes)
 TDG - Transportation Dangerous Goods (Canada)
 TDLo/TCLo - Lowest Published Toxic Dose/Concentration
 TLM - Median Tolerance Limit
 TLV-TWA - Threshold Limit Value-Time Weighted Average
 TSCA - Toxic Substances Control Act
 USEPA - United States Environmental Protection Agency
 USP - United States Pharmacopoeia
 WHMIS - Workplace Hazardous Material Information System

Information Contact Lubricants:

Western Canada, telephone: 1-800-661-1199;
 fax: (780) 464-9564
 Ontario & Central Canada, telephone:
 1-800-268-5850 and (905) 822-4222; fax:
 1-800-201-6285
 Quebec & Eastern Canada, telephone:
 1-800-576-1686; fax: 800-201-6285

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 4/4/2002.

Data entry by Product Safety - JDW.

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

Material Safety Data Sheet / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.
8069 River Way, Delta, British Columbia,
Canada V4G 1L3
Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **LINSEED SOAP**
CHEMICAL FAMILY: Lubricating grease
WHMIS CLASSIFICATION: Not regulated
WORK PLACE HAZARD: Not applicable

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not available
PACKAGE GROUP: Not available
PRODUCT IDENTIFICATION NUMBER (PIN): Not applicable (Petroleum Lubricating Grease)

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	LD50	LC50
Linseed Soap	100%	Mixture		

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY: (Information not available)
[] Skin, [] Eye Contact, [XXX] Inhalation, [] Ingestion

SKIN CONTACT: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis.

EYE CONTACT: Not available.

INHALATION: Inhalation of oil mist or vapors from hot grease may cause irritation of the upper respiratory tract. Long term intensive exposure may cause benign lung fibrosis.

INGESTION: Not available.

CHRONIC OVEREXPOSURE: Not determined.

IRRITATION INDEX: SKIN: Not available.

SYMPTOMS OF EXPOSURE: Not available.

EXPOSURE INFORMATION: Oil mist (particulate): 5 mg/M³ (TLV/TWA)
ACGIH 88/89 10 mg/M³ (TLV/STEL) ACGIH 88/89

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Remove contaminated clothing. Wash contaminated skin with mild soap and water. Wipe excess from skin.

EYE CONTACT: Flush eyes with water for at least fifteen (15) minutes.

INHALATION: Remove victim from further exposure. Additional first aid treatment is not ordinarily required.

INGESTION: Do not induce vomiting. Obtain medical attention immediately.

OTHER INSTRUCTIONS: None

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOR: Semi-solid brown colored grease; slight hydrocarbon odor.

DENSITY (SPECIFIC GRAVITY): 1.0

BOILING POINT: 100° C

MELTING POINT: Not available

WATER SOLUBILITY: Miscible

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Toll Free: 1-800-665-6645

LINSEED SOAP

Page 2 of 3

% VOLATILE BY VOLUME:	Not available
EVAPORATION RATE:	Not available
VAPOR PRESSURE: (mm Hg)	Not available
VAPOR DENSITY: (Air = 1)	Not available
pH:	9.5
VISCOSITY:	Not available

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	222° C
FLAMMABLE LIMIT:	Not available
AUTO IGNITION TEMP:	343° C
EXTINGUISHING MEDIA:	Dry chemical, carbon dioxide CO ₂ , foam water fog.
SPECIAL FIRE FIGHTING PROCEDURES:	No special procedures - Avoid inhalation of smoke. Caution, spilled material is slippery. Use water to cool fire-exposed containers.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	None currently known.

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE []	
INCOMPATIBILITY (CONDITIONS TO AVOID):	Not available.
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon monoxide; carbon dioxide and dense smoke are produced on combustion. Avoid excessive heat, formation of vapors or mists.
HAZARDOUS POLYMERIZATION:	Will not occur [] May occur [] Not Available

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION:	Under conditions of high heat use an air purifying respirator (mechanical filter with accompanying organic vapor cartridge).
VENTILATION:	Highly recommended for all indoor situations to control fugitive emissions. Concentrations in air should be maintained below the recommended threshold limit value if unprotected personnel are involved.
LOCAL:	If oil mist is present or if exposure is exceeded.
MAKE-UP AIR:	Should always be supplied to balance air exhausted (either generally or locally).
PROTECTIVE GLOVES:	Impervious gloves (viton, nitrile, PVC neoprene) should be worn at all times when handling this product.
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.
OTHER PROTECTIVE EQUIPMENT:	Impervious clothing (apron, coveralls) should be worn in confined workspaces or where the risk of skin exposure is much higher.
PERMISSIBLE CONCENTRATIONS:	Not available.

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LINSEED SOAP

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Store in a cool, dry, well ventilated area, away from heat and ignition sources. Avoid excessive heat, formation of oil mist, breathing of vapors and mist of hot oil and prolonged or repeated contact with skin. Launder contaminated clothing prior to reuse. Properly dispose of contaminated leather articles, including shoes, that cannot be decontaminated.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:

Spilled material is slippery. Isolate hazard area and restrict access. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Contain a land spill by diking. For large spills remove by mechanical means and place in containers. Clean area with appropriate cleaner. Do not allow product to run off 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.

WASTE DISPOSAL METHOD:

Reclaim or dispose of at a licensed waste disposal company.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: May 28, 1991

DATE REVISED: April 1, 2000

BY: Product Safety Committee

Review date:

March 31/03

Authorized by:

Alan Lelache

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,
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EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME:

KOPR KOTE

CHEMICAL FAMILY:

Petroleum Based Thread Compound

WHMIS CLASSIFICATION:

Not regulated

WORK PLACE HAZARD:

Not available

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION:

Non Hazardous For Transportation

PACKAGE GROUP:

Not applicable

PRODUCT IDENTIFICATION NUMBER (PIN):

Not available

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	OSHA PEL	ACGIH TLLV
Petroleum Oil	70M	64742-57-0 or 64742-62-7	Oil Mist TWA - 5 mg/m ³	Not applicable
Lead Powder	15M	7439-92-1	Air - 200 ug/M ³	Air - 0.15 mg/M ³
Copper	10M	7440-50-8	N/A	1 mg/M ³

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY: (Information not available)

☐ Skin ☐ Eye Contact ☐ Inhalation ☐ Ingestion

SKIN IRRITANCY

: Very mild

EYE CONTACT

: May cause irritation

INHALATION

: Not available

INGESTION

: May cause diarrhea

SYMPTOMS OF EXPOSURE

: Redness and irritation of skin

EFFECTS OF OVEREXPOSURE

: Repeated skin contact for persons hypersensitive to petroleum products can cause redness and irritation of skin.

MEDICAL CONDITIONS POTENTIALLY

AGGRAVATED BY EXPOSURE

: Unknown

MATERIAL LISTED AS CARCINOGEN

OR POTENTIAL CARCINOGEN

: National Toxicology Program - No. IARC - No. OSHA -No

SECTION IV: FIRST AID MEASURES

SKIN CONTACT

: Remove by wiping, or waterless hand cleaner, followed by washing.

EYE CONTACT

: Wash with copious quantities of water.

INHALATION

: Clear air passages, call a physician.

INGESTION

: **DO NOT** induce vomiting, call a physician.

OTHER INSTRUCTIONS

: Not applicable.

Material Safety Data / Fiche signalétique

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KOPR KOTE

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SECTION V: PHYSICAL DATA

APPEARANCE AND ODOUR	: Copper colored paste; petroleum odour.
DENSITY (SPECIFIC GRAVITY)	: 1.23
BOILING POINT	: 370 ° C
MELTING POINT	: Not applicable
WATER SOLUBILITY	: None
% VOLATILE BY VOLUME	: None
EVAPORATION RATE	: < 0.01 KPA
VAPOR PRESSURE (mm Hg)	: < 0.01 KPA
VAPOR DENSITY (Air = 1)	: > 5.0
pH	: Neutral
VISCOSITY	: 1.10 kg/liter

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	: 294° C (COC Method)
FLAMMABLE LIMIT	: LEL = 0.9% UEL = 7%
AUTO-IGNITION TEMPERATURE	: > 360° C
EXTINGUISHING MEDIA	: Use foam, dry chemical, water spray (fog), carbon dioxide CO ₂ , or vaporizing liquid type extinguishing agents.
SPECIAL FIRE FIGHTING PROCEDURES	: Use supplied air breathing equipment for enclosed or confined spaces.
UNUSUAL FIRE AND EXPLOSION HAZARDS	: None

SECTION VII: REACTIVITY DATA

STABLE [XXX] UNSTABLE []	Under normal conditions
INCOMPATIBILITY (conditions to avoid)	: Strong oxidizing materials and copper reactive agents. Incompatible with 1-bromo-2 propyne, NH ₄ NO ₃ , ClF ₃ , H ₂ O ₂ , NaN ₃ , Na ₂ C ₂ , Zr
HAZARDOUS DECOMPOSITION PRODUCTS	: Hydrogen, carbon monoxide, aldehydes, smoke, toxic fumes and toxic copper and lead compounds.
HAZARDOUS POLYMERIZATION	: Will not occur [XXX] May occur []

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION	: None required.
VENTILATION	: No special ventilation required.
PROTECTIVE GLOVES	: Protective gloves for hypersensitive persons
EYE PROTECTION	: Protective glasses if applied to moving parts.
OTHER PROTECTIVE EQUIPMENT	: Persons with hypersensitive skin should use gloves.
PERMISSIBLE CONCENTRATIONS	: Not available

Material Safety Data / Fiche signalétique

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KOPR KOTE

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PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Normal precautions as with any petroleum product.
Wash hands before eating.
Do not allow to enter drains.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK

Scoop up excess, wipe with rags, pick up residue with diatomaceous earth to avoid walking hazard.

WASTE DISPOSAL METHOD

Consult federal, provincial/state and local regulations for petroleum products.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: May 25, 1991
BY: Product Safety Committee

DATE REVISED: November 2, 2000

Review date:

March 31/03

Authorized by

Alan Lelonde



Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	Not controlled		

Section 1. Chemical Product and Company Identification

Product Name	RELIANCE AW HYDRAULIC OIL 32, 46, 68	Code	490-143, RELAW32 490-144, RELAW46 490-145, RELAW68
Synonym	Not available.	Validated on	6/15/2001.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	These products are designed for use as heavy duty hydraulic power transmission fluids and for lubrication where good anti-wear and anti-oxidation properties are required. They would typically be used in high-pressure hydraulic systems, machine tools, presses, compressors, pumps, gear sets, and centralized bearing lubrication systems in industrial plants and at mining and woodlands sites.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (V/V)	TLV-TWA(8 h)	STEL	CEILING
1) Severely hydrotreated hydrocarbon oil and additives	Mixture	100	5 mg/m ³ (oil mist)	10 mg/m ³ (oil mist)	Not established
Manufacturer Recommendation	Not applicable				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification.

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.
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Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	May be combustible at high temperature.	Flammable Limits	Not available.
Flash Points	OPEN CUP: $\geq 196^{\circ}\text{C}$ (384.8°F) (Cleveland)	Auto-Ignition Temperature	Not available.
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	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container.
Products of Combustion	Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), smoke and irritating vapours as products of incomplete combustion.		

Fire Fighting Media and Instructions	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. SMALL FIRE: use DRY chemicals, foam, water spray or CO2. LARGE FIRE: use water spray, fog or foam. 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.
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Section 6. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 171, Substances (low to moderate hazard). ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if 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 used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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Section 7. Handling and Storage

Handling	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.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection -	The selection of personal protective equipment varies, depending upon conditions of use.
Eyes	Eye protection (i.e., safety glasses, safety goggles and/or face shield) should be 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.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) 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.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid	Viscosity	32: 32.0 cSt @ 40°C, 5.35 cSt @ 100°C, VI=99 46: 46.0 cSt @ 40°C, 6.74 cSt @ 100°C, VI=99 68: 68.0 cSt @ 40°C, 8.69 cSt @ 100°C, VI=99
Colour	Pale, Light green.	Pour Point	32: -36°C 46: -33°C 68: -30°C
Odour	Hydrocarbon.	Softening Point	Not applicable.
Odour Threshold	Not available.	Dropping Point	Not applicable.
Boiling Point	Not available.	Penetration	Not applicable.
Density	0.8693 to 0.8740 kg/L @ 15°C (59°F).	Oil / Water Dist. Coefficient	Not available.
Vapour Density	Not available.	Ionicity (in water)	Not available
Vapour Pressure	Negligible at ambient temperature and pressure.	Dispersion Properties	Not available.
Volatility	Non-volatile.	Solubility	Insoluble in water.

Section 10. Stability and Reactivity

Corrosivity	Copper corrosion, 3h, 100°C (ASTM D0130): 1a		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	Decomposition Products	May release COx, SOx, H2S, POx, CaOx, ZnOx, methacrylate monomers, alkyl mercaptans, aldehydes, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation and ingestion.		
Acute Lethality	Based on toxicity of components. Acute oral toxicity (LD50): >5000 mg/kg (rat). Acute dermal toxicity (LD50): >2000 mg/kg (rabbit).		
Chronic or Other Toxic Effects			
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 give 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 12. Ecological Information

Environmental Fate	Not available	Persistence/ Bioaccumulation Potential	Not available
BOD5 and COD	Not available.	Products of Biodegradation	Not available.
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal	Spent/used/waste 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.		
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Section 14. Transport Information

TDG Classification	Not controlled under TDG (Canada).	Special Provisions for Transport	Not applicable.
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Section 15. Regulatory Information

Other Regulations		This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).																																						
		All components of this formulation are listed on the US EPA-TSCA Inventory.																																						
		All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).																																						
		This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.																																						
		Please contact Product Safety for more information.																																						
DSD/DPD (Europe)		Not evaluated.		HCS (U.S.A.)		Not controlled under the HCS (United States).																																		
ADR (Europe) (Pictograms)		NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.		DOT (U.S.A) (Pictograms)																																				
HMIS (U.S.A.)		<table><tr><td>Health Hazard</td><td>1</td></tr><tr><td>Fire Hazard</td><td>1</td></tr><tr><td>Reactivity</td><td>0</td></tr><tr><td>Personal Protection</td><td>B</td></tr></table>		Health Hazard	1	Fire Hazard	1	Reactivity	0	Personal Protection	B	NFPA (U.S.A.)		<table><tr><td colspan="2"></td><td>Fire Hazard</td><td>Rating</td><td>0 Insignificant</td></tr><tr><td>Health</td><td>1</td><td>Reactivity</td><td></td><td>1 Slight</td></tr><tr><td></td><td></td><td>Specific hazard</td><td></td><td>2 Moderate</td></tr><tr><td></td><td></td><td></td><td></td><td>3 High</td></tr><tr><td></td><td></td><td></td><td></td><td>4 Extreme</td></tr></table>				Fire Hazard	Rating	0 Insignificant	Health	1	Reactivity		1 Slight			Specific hazard		2 Moderate					3 High					4 Extreme
Health Hazard	1																																							
Fire Hazard	1																																							
Reactivity	0																																							
Personal Protection	B																																							
		Fire Hazard	Rating	0 Insignificant																																				
Health	1	Reactivity		1 Slight																																				
		Specific hazard		2 Moderate																																				
				3 High																																				
				4 Extreme																																				

Section 16. Other Information

References	Available upon request. * Marque de commerce de Petro-Canada - Trademark		
Glossary	ACGIH - American Conference of Governmental Industrial Hygienists ADR - Agreement on Dangerous goods by Road (Europe) ASTM - American Society for Testing and Materials (BOD5 - Biological Oxygen Demand in 5 days CAN/CGA B149.2 Propane Installation Code CAS - Chemical Abstract Services CEPA - Canadian Environmental Protection Act CERCLA - Comprehensive Environmental Response, Compensation and Liability Act CFR - Code of Federal Regulations CHIP - Chemicals Hazard Information and Packaging Approved Supply List COD5 - Chemical Oxygen Demand in 5 days CPR - Controlled Products Regulations DOT - Department of Transport DSCL - Dangerous Substances Classification and Labeling (Europe) DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe) DSL - Domestic Substance List EEC/EU - European Economic Community/European Union EINECS - European Inventory of Existing Commercial Chemical Substances EPCRA - Emergency Planning and Community Right to Know Act FDA - Food and Drug Administration FIFRA - Federal Insecticide, Fungicide and Rodenticide Act HCS - Hazardous Communication System HMIS - Hazardous Material Information System IARC - International Agency for Research on Cancer IRIS - Integrated Risk Information System LD50/LC50 - Lethal Dose/Concentration kill 50% LDLo/LCLo - Lowest Published Lethal Dose/Concentration NAERG'96 - North American Emergency Response Guide Book (1996) NFPA - National Fire Prevention Association NIOSH - National Institute for Occupational Safety & Health NPRI - National Pollutant Release Inventory NSNR - New Substances Notification Regulations (Canada) NTP - National Toxicology Program OSHA - Occupational Safety & Health Administration PEL - Permissible Exposure Limit RCRA - Resource Conservation and Recovery Act SARA - Superfund Amendments and Reorganization Act SD - Single Dose STEL - Short Term Exposure Limit (15 minutes) TDG - Transportation Dangerous Goods (Canada) TDLo/TCLo - Lowest Published Toxic Dose/Concentration TLM - Median Tolerance Limit TLV-TWA - Threshold Limit Value-Time Weighted Average TSCA - Toxic Substances Control Act USEPA - United States Environmental Protection Agency USP - United States Pharmacopoeia WHMIS - Workplace Hazardous Material Information System		
For Copy of MSDS	Lubricants: Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564 Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285 Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285 For Product Safety Information: (905) 804-4752		
	Prepared by Product Safety - TAR on 6/15/2001. Data entry by Product Safety - JDW.		

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

MATERIAL SAFETY DATA SHEET

MSDS Number: 51163E - 21

24 Hour Emergency Assistance: CHEMTEL (877) 276-7283

General Assistance Number: (877) 276-7285

SECTION 1 PRODUCT IDENTIFICATION

MATERIAL IDENTITY: Regular Unleaded Gasoline (Conventional, CARB and RFG)

PRODUCT CODES: 00315, 00330, 00337, 00351, 00371, 00478, 00781, 00782, 00783, 01002, 01004, 01136, 01141, 01145, 01149, 01182, 01418, 01449, 01453, 02570, 02574, 02583, 02595, 02610, 02616, 02632, 02635, 02738, 02751, 02752, 02754, 04976, 04977, 07437, 07438, 07644, 07671, 07672, 07687, 08601, 08602, 08603, 08604, 26603, 26609, 26614, 26615, 26616, 26619, 26620, 26671, 26770, 26777, 26808, 26814, 26844, 26846, 26847, 26848, 34212, 34215

COMPANY ADDRESS: Equilon Enterprises LLC, P. O. Box 4453, Houston, TX. 77210-4453

SECTION 2 PRODUCT/INGREDIENTS

CAS#	CONCENTRATION	INGREDIENTS
Mixture	100 %volume	Gasoline (Conventional, CARB and RFG)
Mixture	0 - 49.99 %volume	Miscellaneous Hydrocarbons
1330-20-7	0 - 24.99 %volume	Xylene, mixed isomers
108-88-3	0 - 24.99 %volume	Toluene
95-63-6	0 - 4.99 %volume	1,2,4-Trimethyl Benzene (Pseudocumene)
100-42-5	0 - 3.99 %volume	Styrene
71-43-2	0 - 3.99 %volume	Benzene
100-41-4	0 - 2.99 %volume	Ethyl Benzene
110-54-3	0 - 2.99 %volume	Hexane
110-82-7	0 - 0.99 %volume	Cyclohexane
91-20-3	0 - 0.99 %volume	Naphthalene
1634-04-4	0 - 14.99 %volume	Methyl Tert-Butyl Ether (MTBE)
637-92-3	0 - 18.49 %volume	Ethyl Tert-Butyl Ether (ETBE)
994-05-8	0 - 18.59 %volume	Tert-Amyl Methyl Ether (TAME)
108-20-3	0 - 1.99 %volume	Diisopropyl Ether (DIPE)

NOTE: Content of Gasoline components will vary; Individual components may be present from trace amounts up to the maximum shown.

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance & Odor: Bronze color, clear & bright liquid. Hydrocarbon odor.
Health Hazards: May be harmful or fatal if swallowed. Do not induce vomiting.
May cause aspiration pneumonitis. May cause CNS depression.
Physical Hazards: Material is extremely flammable and heavier than air.
Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger.
NFPA Rating (Health, Fire, Reactivity): 1, 3, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3
Extreme - 4

Inhalation:

May cause irritation to the nose, throat and respiratory tract. Breathing of high vapor concentrations may cause CNS depression, evidenced by dizziness, light-headedness, headache, nausea, drowsiness, and loss of coordination. Continued inhalation may result in unconsciousness.

Eye Irritation:

May be irritating to the eyes causing a burning sensation, redness, swelling and/or blurred vision.

Skin Contact:

May be irritating to the skin causing a burning sensation, redness and/or swelling. Prolonged or repeated skin contact can cause defatting and drying of the skin which may result in a burning sensation and a dried, cracked appearance.

Ingestion:

This material may be harmful or fatal if swallowed. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis. Generally considered to have a low order of acute oral toxicity.

Other Health Effects:

Carcinogenic in animal tests. Gasoline has been tested by API in a long-term inhalation test in mice and rats. There was an increased incidence of liver cancer in female mice. Male rats had a dose related increase in kidney tumors. This effect was due to formation of alpha-2u-globulin in the rats. This material is not formed in humans and is therefore not considered relevant. It is probable that the material causes cancer in laboratory animals. Material may adversely effect male reproductive performance based on testing in laboratory animals.

This material and/or components may cause the following effects:

Developmental Toxicity, Genotoxicity, Immunotoxicity, Reproductive Toxicity

Primary Target Organs:

The following organs and/or organ systems may be damaged by overexposure to this material and/or its components.

Cardiovascular System, Blood/Blood Forming Organs, Kidney, Liver, Nervous

System

Signs and Symptoms:

Irritation as noted above. Aspiration pneumonitis may be evidenced by coughing, labored breathing and cyanosis (bluish skin); in severe cases death may occur. Damage to blood-forming organs may be evidenced by: a) easy fatigability and pallor (RBC), b) decreased resistance to infection (WBC effect), c) excessive bruising and bleeding (platelet effect). Kidney damage may be indicated by changes in urine output or appearance, pain upon urination or in the lower back or general edema (swelling from fluid retention). Liver damage may be indicated by loss of appetite, jaundice (yellowish skin and eye color), fatigue and sometimes pain and swelling in the upper right abdomen.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:

Move victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin:

Remove contaminated clothing. Flush with large amounts of water for at least 15 minutes and follow by washing with soap if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye:

Flush eyes with large amounts of water for at least 15 minutes. If redness, burning, blurred vision or swelling persist, transport to nearest medical facility for additional treatment.

Ingestion:

DO NOT take internally. Do NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. Get medical attention. In general no treatment is necessary unless large quantities are swallowed, however, get medical advice. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Note to Physician:

If more than 2.0ml/kg body weight has been ingested and vomiting has not occurred, emesis should be induced with supervision. Keep victim's head below hips to prevent aspiration. If symptoms such as loss of gag reflex, convulsions, or unconsciousness occur before emesis, gastric lavage using a cuffed endotracheal tube should be considered.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: -40 °F/-40 °C [Tagliabue Closed Cup]
Flammability in Air: 1.3 - 7.6 %volume

Extinguishing Media:

Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water. Material will float and can be re-ignited on surface of water.

Fire Fighting Instructions:

DANGER! EXTREMELY FLAMMABLE. Clear fire area of all non-emergency personnel. Only enter confined fire space with full bunker gear, including a positive pressure, NIOSH-approved, self-contained breathing apparatus. Cool surrounding equipment, fire-exposed containers and structures with water. Container areas exposed to direct flame contact should be cooled with large quantities of water (500 gallons water per minute flame impingement exposure) to prevent weakening of container structure.

Unusual Fire Hazards:

Vapors are heavier than air accumulating in low areas and traveling along the ground away from the handling site. Do not weld, heat or drill on or near container. However , if emergency situations require drilling, only trained emergency personnel should drill.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:

DANGER! EXTREMELY FLAMMABLE! Eliminate potential sources of ignition. Handling equipment must be bonded and grounded to prevent sparking.

Spill Management:

Dike and contain spill.

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

Reporting:

CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air,

land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:

Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking. Do not siphon gasoline by mouth; harmful or fatal if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

For use as a motor fuel only. Do not use as a cleaning solvent or for other non-motor fuel uses.

Handling:

Surfaces that are sufficiently hot may ignite liquid material. Material is extremely flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger.

Keep containers closed when not in use. WARNING! The flow of gasoline through the pump nozzle can produce static electricity, which may cause a fire if gasoline is pumped into an ungrounded container. To avoid static buildup, place approved container on the ground. Do not fill container in vehicle or truck bed. Keep nozzle in contact with container while filling. Do not use automatic pump handle (latch-open) device. Turn off all battery operated portable electronic devices (examples include: cellular phones, pagers and CD players) before operating gasoline pump. Use only with adequate ventilation.

Storage:

Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Keep liquid and vapor away from heat, sparks and flame. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapors have dissipated. Use explosion-proof ventilation to prevent vapor accumulation while in use.

Container Warnings:

Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or

perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Benzene ppmv Notation: Skin	ACGIH TLV	TWA: 0.5 ppmv	STEL: 2.5
Benzene ppmv	OSHA PEL	TWA: 1 ppmv	STEL: 5
Cyclohexane	ACGIH TLV	TWA: 300 ppmv	
Cyclohexane	OSHA PEL	TWA: 300 ppmv	
Ethyl Benzene ppmv	ACGIH TLV	TWA: 100 ppmv	STEL: 125
Ethyl Benzene	OSHA PEL	TWA: 100 ppmv	
Ethyl Benzene ppmv	OSHA PEL - 1989(revoked)	TWA: 100 ppmv	STEL: 125
Gasoline ppmv	ACGIH TLV	TWA: 300 ppmv	STEL: 500
Gasoline ppmv	OSHA PEL - 1989(revoked)	TWA: 300 ppmv	STEL: 500
Isopropyl ether ppmv	ACGIH TLV	TWA: 250 ppmv	STEL: 310
Isopropyl ether	OSHA PEL	TWA: 500 ppmv	
Methyl T-Butyl Ether	ACGIH TLV	TWA: 40 ppmv	
N-Hexane	OSHA PEL	TWA: 50 ppmv	
N-Hexane	OSHA PEL - 1989(revoked)	TWA: 50 ppmv	
Naphthalene ppmm	ACGIH TLV	TWA: 10 ppmm	STEL: 15
Naphthalene	OSHA PEL	TWA: 10 ppmv	
Naphthalene ppmv	OSHA PEL - 1989(revoked)	TWA: 10 ppmv	STEL: 15
Styrene ppmv	ACGIH TLV	TWA: 20 ppmv	STEL: 40
Styrene 200 ppmv	OSHA PEL	TWA: 100 ppmv	Ceiling:
Styrene ppmv	OSHA PEL - 1989(revoked)	TWA: 50 ppmv	STEL: 100
Styrene, monomer ppmv Notation: Embryo-Fetus Policy	SHELL PEL - 1989(revoked)	TWA: 50 ppmv	STEL: 100
Toluene Skin	ACGIH TLV	TWA: 50 ppmv	Notation:
Toluene 300 ppmv	OSHA PEL	TWA: 200 ppmv	Ceiling:
Toluene ppmv	OSHA PEL - 1989(revoked)	TWA: 100 ppmv	STEL: 150
Toluene	SHELL SIS	TWA: 50 ppmv	
Trimethyl Benzene	ACGIH TLV	TWA: 25 ppmv	
Trimethyl Benzene	OSHA PEL - 1989(revoked)	TWA: 25 ppmv	
Trimethyl Benzene	SHELL PEL - 1989(revoked)	TWA: 25 ppmv	

xylylene (o-, m-, p- isomers) OSHA PEL	TWA: 100 ppmv
xylylene (o-, m-, p- isomers) OSHA PEL - 1989(revoked)	TWA: 100 ppmv STEL: 150 ppmv
Xylylene (o-, m-, p-isomers) ACGIH TLV	TWA: 100 ppmv STEL: 150 ppmv

EXPOSURE CONTROLS

Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.

PERSONAL PROTECTION

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:

Chemical Goggles - If liquid contact is likely.

Skin Protection:

Use protective clothing which is chemically resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:

Neoprene, or Nitrile Rubber, or Polyvinyl Alcohol (PVA)

Respiratory Protection:

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:

Supplied-Air Respirator. Air-Purifying Respirator for Organic Vapors.

Self-contained breathing apparatus.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Bronze color, clear & bright liquid. Hydrocarbon odor.

Substance Chemical Family: Hydrocarbon

Flammability in Air: 1.3 - - 7.6 %volume

Flash Point: -40 °F [Tagliabue Closed Cup]

Freezing Point: -72 °F
Solubility (in Water): Negligible
Specific Gravity: 0.72 - - 0.76
Stability: Stable
Vapor Density: 3.5
Vapor Pressure: 7 - - 14.5 psia [Reid]
Viscosity: < 1.4 cSt Typical @ 100 °F
Volatility: 100 %volume

SECTION 10 REACTIVITY AND STABILITY

Stability:
Material is stable under normal conditions.

Conditions to Avoid:
Avoid heat, sparks, open flames and other ignition sources.

Materials to Avoid:
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products:
Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Aldehydes, Carbon Monoxide, Carbon Dioxide, Peroxide, Styrene oxide and other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Dermal LD50 >2 g/kg(Rabbit) OSHA: Non-Toxic Based on similar material(s)
Eye Irritation Moderate to Severe Irritation [Human] OSHA: Irritating
Based on similar material(s)
Oral LD50 >5 g/kg(Rat) OSHA: Non-Toxic Based on similar material(s)
Skin Irritation Draize 0.98 [Rabbit, 24 HOUR(S)] OSHA: Irritating Based on similar material(s)

Carcinogenicity:

Gasoline has been tested by API in a long-term inhalation test in mice and rats. There was an increased incidence of liver cancer in female mice. Male rats had a dose related increase in kidney tumors. This effect was due to formation of alpha-2u-globulin in the rats. This material is not formed in humans and is therefore not considered relevant.

Carcinogenicity Classification

Gasoline (Conventional, CARB and RFG)

IARC: Possible Carcinogen (2B) ACGIH: A3 OSHA: Yes

Benzene

NTP: Yes IARC: Carcinogen (1) ACGIH: A1 OSHA: Yes

Ethyl Benzene

IARC: Possible Carcinogen (2B)

Methyl Tert-Butyl Ether (MTBE)

ACGIH: A3

Naphthalene

ACGIH: A4

Styrene

IARC: Possible Carcinogen (2B) ACGIH: A4

Toluene

IARC: Not Classifiable (3) ACGIH: A4

Toxic Effects - Equiva Gasoline MSDS

Carcinogenicity

Chronic inhalation of wholly vaporized gasoline produced kidney tumors in male rats and liver tumors in female mice. The kidney tumors have been shown to develop through a unique mechanism involving Alpha-2u globulin. This protein is not present in humans making the kidney tumors irrelevant to potential human health risks. Origin of the female mouse liver tumors is less understood, leaving their significance for human risks uncertain. Prolonged and repeated exposure to high concentrations (10s to 100s ppm) of benzene may cause serious injury to blood-forming organs, is associated with anemia (depletion of blood cells) and is linked to the later development of acute myelogenous leukemia (AML) in humans. A recent chronic bioassay of ethylbenzene by the NTP produced clear evidence of carcinogenicity in male rats based on kidney tumor increase. Other animal tumors possibly associated with ethylbenzene include testicular adenomas in male rats, kidney tumors in female rats, lung tumors in male mice and liver tumors in female mice. Toluene is not known to be mutagenic or carcinogenic although available human and experimental animal data are limited and insufficient to assess carcinogenic potential. Chronic inhalation of MTBE produced liver tumors in female mice and kidney tumors in male rats. These tumors are of questionable relevance to humans and further studies are being done to address their significance.

Cardiovascular System

While there is no evidence that workplace exposure to acceptable levels of toluene vapors (e.g., the TLV) have produced cardiac effects in humans, high concentrations may cause cardiac sensitization and sudden lethality has been reported from habitual sniffing of solvents or glue. Animal studies have confirmed the sensitizing effects. Sensitization may lead to fatal changes in

heart rhythms. Hypoxia or injection of adrenalin-like agents may enhance this effect. Thickening of heart blood vessels has been reported in animals exposed to xylene.

Developmental Toxicity

Daily exposure of pregnant rats to unleaded gasoline vapor at concentrations up to 9000 ppm resulted in no detectable maternal or developmental toxicity. Numerous studies of benzene in experimental animals have failed to detect teratogenic effects (birth defects) even at doses of benzene toxic to the mothers. There is some evidence of fetal toxicity, but not malformations, in mice and rabbits exposed to 500 ppm and higher concentrations of benzene vapor during gestation. Ethylbenzene caused birth defects in rats but not rabbits at doses that produced toxic effects in the mothers. n-Hexane produced fetal toxicity, reduced fetal weight, in mice at maternally toxic doses. Developmental toxicity studies of xylenes showed embryo-lethal/toxic and teratogenic effects with maternal toxicity. Many case studies involving abuse during pregnancy implicate toluene as a developmental toxicant. Studies in laboratory animals have shown developmental effects comparable to those reported in humans, but the effects were generally associated with maternal toxicity. Exposing pregnant mice to maternally toxic MTBE levels greater than 1000 ppm produced adverse gestational and developmental effects including malformations. No developmental toxicity was seen in rabbits exposed to MTBE concentrations up to 8000 ppm. Birth defects in mice and fetotoxicity in both rats and mice were observed following maternally toxic TAME exposures. Exposure of pregnant rats to high concentrations of DIPE (3095 and 6745 ppm) by inhalation during pregnancy increased the frequency of rudimentary 14th ribs in the offspring. The effect was not seen following exposure to 430 ppm DIPE. The significance of this finding is not known.

Genotoxicity

Unleaded gasoline was tested for genetic activity in tests using microbial cells, cultured mammalian cells and rats (bone marrow) and was judged to be negative in every case. Benzene has been shown to be non-mutagenic or weakly mutagenic in a variety of in vitro (test tube) systems. It has, however, been found to cause other types of chromosome damage (micronuclei, chromosome breakage, non-dysjunctional events) in both laboratory animals and workers exposed to high doses of benzene. These effects appear to be related to one or more metabolites of benzene, possibly acting in combination. Benzene metabolites can also bind to proteins forming detectable complexes (adducts). There is limited evidence of binding to the genetic material (DNA) itself. The relationship of these effects to the causation of leukemia or tumors in experimental animals is unknown. Changes in chromosomes of lymphocytes have been identified in some studies of humans exposed to styrene. The significance of these changes is not known, and other such studies have produced negative results. Chromosomal breaks have been reported in the bone marrow cells of rats exposed to styrene by inhalation along with increased frequency of sister chromatid exchanges in alveolar macrophages, bone marrow cells and regenerating liver cells. Ethylbenzene was not mutagenic in a number of in vitro procedures. Naphthalene was negative in Ames mutagenicity and rat cell transformation assays. Cyclohexane and pseudocumene were also negative in Ames testing. Toluene was negative in the Ames assay and negative for chromosomal aberrations and sister-chromatid exchanges in human lymphocytes and in an in

vitro test using hamster cells. Mouse lymphoma test results for toluene were inconclusive. MTBE was negative in several mutagenicity tests, but was positive in a mouse lymphoma test.

Blood/Blood Forming Organs

Prolonged and repeated exposure to high concentrations (10s to 100s ppm) of benzene may cause serious injury to blood-forming organs and is associated with anemia (depletion of blood cells). Repeated exposure of rabbits to high cyclohexane vapor concentrations causes a slight increase in blood clotting time. Blood effects were seen in rats following prolonged and repeated oral exposure to a mixture of xylenes containing ethylbenzene.

Immunotoxicity

Various studies of workers exposed to high levels of benzene have found impairment of both humoral (antibody) and cellular immunity, most notably a decrease in levels of circulating leukocytes. Many of these exposures also involve other solvents and chemicals. Animal studies with high benzene doses have reported similar effects.

Kidney

Long-term inhalation of wholly vaporized gasoline caused increased kidney weight and progressive nephropathy (tissue damage) in male rats. In rats exposed orally to a xylene mixture also containing ethylbenzene, males developed hyaline droplet changes and females showed evidence of early chronic nephropathy. Intentional abuse of toluene vapors by 'glue-sniffers' has been associated with damage to the kidneys. Long term inhalation of up to 8000 ppm MTBE vapor produced a chronic, progressive nephropathy (kidney damage) in male rats. This effect may be related to the accumulation of alpha-2u globulin and therefore specific to the male rat. (See Carcinogenicity) Increased kidney weights without evidence of tissue injury were reported in rats exposed to high, inhaled doses of TAME. Prolonged inhalation of DIPE (90 days or longer) increased kidney weights in both male and female rats. In male rats exposed to the highest concentration (7100 ppm) there was also evidence of microscopic changes (hyaline droplets) in the kidney tubules resembling those produced by exposure to gasoline.

Liver

Inhalation of gasoline vapor increased liver weights, urinary excretion of ascorbic acid, and hepatic enzyme activity in male rats. Liver weight increases were seen in rats dosed orally for 90 days with a xylene mixture also containing ethylbenzene. Reversible liver damage has been reported in persons exposed to toluene by solvent abuse. Liver weight increases without evidence of tissue injury were seen in rats exposed to greater than 500 ppm TAME by inhalation for four weeks. Prolonged inhalation of DIPE (90 days or longer) increased liver weights in both rats and rabbits. In rabbits and in male rats exposed to 7100 ppm there was also evidence of microscopic changes in the liver tissue.

Nervous System

Inhalation of MTBE vapors at high concentrations (above 800 ppm) induced reversible central nervous system depression in rats. Inhalation of TAME at concentrations greater than 250 ppm produced reversible sedation in rats and

mice.

Neurotoxicity

Inhalation exposure to high n-hexane concentrations has resulted in peripheral neuropathy in rodents and also in human workers. Rats receiving prolonged and repeated exposure to high doses of xylene have shown hearing loss. Prolonged and repeated exposures to high toluene concentrations (mixed solvent) have resulted in hearing loss in laboratory animals. There have also been reports of hearing damage in humans overexposed to toluene and other solvents, however, these effects and their possible relationship to noise exposure remain uncertain. Intentional inhalation ('glue-sniffing') and resulting overexposure to toluene vapors has been linked to brain injury. Rats exposed repeatedly to high concentrations of styrene vapor also developed hearing deficits.

Reproductive Toxicity

Inhalation of high n-hexane concentrations resulted in testicular and epididymal lesions in laboratory animals. Animal studies on benzene have shown testicular effects and alteration in reproductive cycles.

Sensitization

Gasoline and component petroleum streams blended to produce it were tested in animal studies and found not to cause skin sensitization.

Systemic Toxicity

Studies on n-hexane in laboratory animals have shown mild, transitory effects on the spleen and blood (white blood cells) and evidence of nasal tract and lung damage. Chronic exposure to vapors of a mixture containing 50% pseudocumene (and possibly contaminated with benzene) caused decreased weight gain and blood changes (lymphopenia and neutrophilia), liver, lung, spleen, kidney, and bone marrow effects in rats. Microscopic changes in the lung, including congestion, hemorrhage, edema, exudation, and leukocyte infiltration were observed in rats and guinea pigs following acute inhalation of styrene. In fatally exposed animals, pulmonary congestion, edema, and necrosis of the kidney and liver were reported. Repeated exposure to high vapor concentrations of cyclohexane caused minor microscopic liver and kidney changes in rabbits. Laboratory animals exposed to prolonged and repeated doses of xylenes by various routes have shown effects in liver, kidneys, lungs, spleen, heart, blood and adrenals.

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:
There is no ecological data available for this product.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

If this material, as it is originally purchased, were subsequently DISCARDED as a waste, the waste would be a RCRA hazardous waste.

D001 (Ignitable Hazardous Waste) D018 (Toxicity, Benzene > 0.5 mg/l)

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification

Proper Shipping Name: Gasoline
Identification Number: UN1203
Hazard Class/Division: 3 (Flammable Liquid)
Packing Group: II
Marine Pollutant % of Total: 100 %weight
Marine Pollutant: Marine Pollutant based on the presence of >10% hydrocarbons listed in 49 CFR 172.101, appendix B; main constituents Trimethylbenzene and Naphthalene.
Oil: Per 49 CFR 130.5, containers of 3500 gallon capacity or greater transported by road or rail are excepted from 49 CFR 172.303(L)(2) if shipping papers contain the word 'OIL'; exceptions are not applicable to shipments by water.
Emergency Response Guide # 128

SECTION 15 REGULATORY INFORMATION

FEDERAL REGULATORY STATUS

OSHA Classification:
Product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 19.10.1200.

Ozone Depleting Substances (40 CFR 82 Clean Air Act):
This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:

There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):

Immediate Health:YES Delayed Health:YES Fire:YES Pressure:NO
Reactivity:NO

SARA Toxic Release Inventory (TRI) (313):

Xylene (mixed isomers), Styrene, 1,2,4-Trimethylbenzene, Toluene, Naphthalene, Methyl Tert-Butyl Ether, N-Hexane, Ethylbenzene, Cyclohexane, Benzene

Toxic Substances Control Act (TSCA) Status:

All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

Other Chemical Inventories:

Australian AICS, Chinese Inventory, European EINECS, Japan ENCS, Korean Inventory, Philippines PICCS

State Regulation

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65):

The chemical identified with this code, Reproductive Toxin is known to the state of California to cause birth defects or other reproductive harm. The chemical identified with this code, Carcinogen & Reproduction Toxin, is known to the state of California to cause both cancer and birth defects or other reproductive harm.

Benzene (71-43-2)	0 - 4	%volume	CA_65 C/R
Toluene (108-88-3)	0 - 25	%volume	CA_65 R

New Jersey Right-To-Know Chemical List:

Benzene (71-43-2)	0 - 3.99	%volume	Carcinogen
Benzene (71-43-2)	0 - 3.99	%volume	Mutagen
Benzene, Methyl- (108-88-3)	0 - 24.99	%volume	
Cyclohexane (110-82-7)	0 - 0.99	%volume	
Ethylbenzene (0851)	0 - 2.99	%volume	
Methyl Tert-Butyl Ether (1634-04-4)	0 - 14.99	%volume	
Naphthalene (1322)	0 - 0.99	%volume	
Propane, 2,2'-oxybis- (108-20-3)	0 - 1.99	%volume	
Styrene (100-42-5)	0 - 3.99	%volume	Mutagen
Xylenes (1330-20-7)	0 - 24.99	%volume	

Pennsylvania Right-To-Know Chemical List:

Benzene (71-43-2)	0 - 3.99	%volume	Spec Haz Sub/Env
Hazardous			

Benzene, dimethyl- (1330-20-7)	0 - 24.99	%volume	Environmental Hazard
Benzene, ethenyl (100-42-5)	0 - 3.99	%volume	Environmental Hazard
Benzene, Ethyl- (100-41-4)	0 - 2.99	%volume	Environmental Hazard
Benzene, Methyl- (108-88-3)	0 - 24.99	%volume	Environmental Hazard
Cyclohexane (110-82-7)	0 - 0.99	%volume	Environmental Hazard
Methyl Tert-Butyl Ether (1634-04-4)	0 - 14.99	%volume	Environmental Hazard
Naphthalene (91-20-3)	0 - 0.99	%volume	Environmental Hazard
Propane, 2,2'-oxybis- (108-20-3)	0 - 1.99	%volume	

SECTION 16 OTHER INFORMATION

Revision#: 21

Revision Date: 10/13/2000

Revisions since last change (discussion): This Material Safety Data Sheet has been changed to include new information on the potential carcinogenicity of component Ethylbenzene and to add Diisopropyl Ether (DIPE) as a component. We encourage you to take the opportunity to reread the sheet and review the information contained. Changes have occurred in the following Sections: 2, 11, 15.

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

PRODUCT CODES: 00315, 00330, 00337, 00351, 00371, 00478, 00781, 00782, 00783, 01002, 01004, 01136, 01141, 01145, 01149, 01182, 01418, 01449, 01453, 02570, 02574, 02583, 02595, 02610, 02616, 02632, 02635, 02738, 02751, 02752, 02754, 04976, 04977, 07437, 07438, 07644, 07671, 07672, 07687, 08601, 08602, 08603, 08604, 26603, 26609, 26614, 26615, 26616, 26619, 26620, 26671, 26770, 26777, 26808, 26814, 26844, 26846, 26847, 26848, 34212, 34215

Regular Unleaded Gasoline (Conventional, CARB and RFG)

DANGER!

EXTREMELY FLAMMABLE. VAPORS MAY EXPLODE. OVEREXPOSURE TO VAPORS CAN CAUSE CNS DEPRESSION. MAY CAUSE SKIN AND EYE IRRITATION. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. CONTAINS BENZENE WHICH IS A CANCER HAZARD - LINKED TO DEVELOPMENT OF ACUTE MYELOGENOUS LEUKEMIA.

LONG-TERM EXPOSURE TO GASOLINE VAPORS HAS CAUSED CANCER IN LABORATORY ANIMALS.
PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS.

MAY CAUSE DAMAGE TO: Cardiovascular System, Blood/Blood Forming Organs,
Kidney, Liver, Nervous System

This material and/or components may cause the following effects:
Developmental Toxicity, Genotoxicity, Immunotoxicity, Reproductive Toxicity

Precautionary Measures:

Avoid heat, sparks, open flames and other ignition sources. Do not take internally. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Keep container closed when not in use. Wash thoroughly after handling.

FIRST AID

Inhalation: Move victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin Contact: Remove contaminated clothing. Flush with large amounts of water for at least 15 minutes and follow by washing with soap if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

Eye Contact: Flush eyes with large amounts of water for at least 15 minutes. If redness, burning, blurred vision or swelling persist, transport to nearest medical facility for additional treatment.

Ingestion: DO NOT take internally. DO NOT induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into lungs. Get medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Have victim rinse mouth out with water, then drink sips of water to remove taste from mouth. In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

FIRE

In case of fire, Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames. Do not use a direct stream of water. Material will float and can be re-ignited on surface of water.

SPILL OR LEAK

Dike and contain spill.

FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

CONTAINS: Miscellaneous Hydrocarbons, Mixture; Xylene, mixed isomers,

1330-20-7; Toluene, 108-88-3; 1,2,4-Trimethyl Benzene (Pseudocumene), 95-63-6; Styrene, 100-42-5; Benzene, 71-43-2; Ethyl Benzene, 100-41-4; Hexane, 110-54-3; Cyclohexane, 110-82-7; Naphthalene, 91-20-3; Methyl Tert-Butyl Ether (MTBE), 1634-04-4; Ethyl Tert-Butyl Ether (ETBE), 637-92-3; Tert-Amyl Methyl Ether (TAME), 994-05-8; Diisopropyl Ether (DIPE), 108-20-3

NFPA Rating (Health, Fire, Reactivity): 1, 3, 0

TRANSPORTATION

US Department of Transportation Classification

Proper Shipping Name: Gasoline
Identification Number: UN1203
Hazard Class/Division: 3 (Flammable Liquid)
Packing Group: II
Marine Pollutant % of Total: 100 %weight
Marine Pollutant: Marine Pollutant based on the presence of >10% hydrocarbons listed in 49 CFR 172.101, appendix B; main constituents Trimethylbenzene and Naphthalene.
Oil: Per 49 CFR 130.5, containers of 3500 gallon capacity or greater transported by road or rail are excepted from 49 CFR 172.303(L)(2) if shipping papers contain the word 'OIL'; exceptions are not applicable to shipments by water.
Emergency Response Guide # 128

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

Name and Address

Equilon Enterprises LLC
P. O. Box 4453
Houston, TX 77210-4453

TRANSPORTATION EMERGENCY CHEMTEL (877) 276-7283

HEALTH EMERGENCY CHEMTEL (877) 276-7283

ADMINISTRATIVE INFORMATION

COMPANY ADDRESS: Equilon Enterprises LLC, P. O. Box 4453, Houston, TX. 77210-4453

Company Product Stewardship & Regulatory Compliance Contact: Ken Darmer
Phone Number: (281) 874-7982

MSDS FAX-BACK Phone Number: (877) 276-7285

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT DATA. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH

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TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT DATA, IS THE PROPERTY OF EQUIVA SERVICES LLC AND IS NOT TO BE THE SUBJECT OF SALE OR EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF EQUIVA SERVICES LLC.

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Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
 	B-3, D-2B	   	

Section 1. Chemical Product and Company Identification

Product Name	DIESEL FUEL	Code	W104, W293 SAP: 120, 121, 122, 287
Synonym	Diesel 50, Diesel 50 LS, #1 Diesel, #1 Diesel LS, Diesel LC, Seasonal Diesel, Seasonal Diesel LS, Diesel AA, Domestic Marine Diesel, International marine Diesel, Seasonal Diesel Locomotive, Domestic Marine diesel LS, diesel -20°C (LS), LSD, Low Sulphur Diesel, dyed diesel, marked diesel, coloured diesel, Naval Distillate, Ultra Low Sulphur Diesel, ULS Diesel, Mining Diesel, Mining Diesel Special, Mining Diesel Special LS, High Flash Mining Diesel, Furnace Oil, Stove Oil.	Validated on	8/17/2005.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining Diesel has a higher flash point requirement, for safe use in underground mines.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (V/V)	TLV-TWA(8 h)	STEL	CEILING
Diesel oil.	68334-30-5	>99.9	100 mg/m ³ (as total hydrocarbons) *	Not established	Not established
Proprietary additives.	Not available	<0.1	Not established	Not established	Not established
Aromatic content is 50% maximum (benzene: nil). Sulphur content is 0-0.50%.					
Manufacturer Recommendation	* Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification.

Potential Health Effects	Combustible liquid. Exercise caution when handling this material. Contact with this product may cause skin and eye irritation. Prolonged or repeated contact may cause skin irritation, defatting, drying and dermatitis. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. For more information refer to Section 11 of this MSDS.
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Section 4. First Aid Measures

Eye Contact	Avoid direct contact. Quickly and gently blot or brush away chemical. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately.
Skin Contact	Avoid direct contact. Wear chemical resistant protective clothing if necessary. Quickly and gently, blot or brush away excess chemical. Wash gently and thoroughly with warm water and non-abrasive soap for 15 minutes or until chemical is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g., watch bands, belts, etc.). Obtain medical attention immediately. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately transport victim to an emergency care facility.

Ingestion NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Repeat administration of water. If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Quickly transport victim to an emergency care facility.

Note to Physician Not available

Section 5. Fire-fighting Measures

Flammability	Class II - combustible liquid (NFPA).	Flammable Limits	LOWER: 0.7%, UPPER: 6% (NFPA)
Flash Points	Diesel Fuel: Closed Cup: >40°C (>104°F) Marine Diesel Fuel: Closed Cup: >60°C (>140°F) Mining Diesel: Closed Cup: 52°C (126°F)	Auto-Ignition Temperature	225°C (437°F)
Fire Hazards in Presence of Various Substances	Flammable in presence of open flames, sparks, or heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite. May accumulate in confined spaces.	Explosion Hazards in Presence of Various Substances	Containers may explode in heat of fire. Do not cut, weld, heat, drill or pressurize empty container. Vapour explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.
Products of Combustion	Carbon oxides (CO, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), sulphur compounds (H ₂ S), water vapour (H ₂ O), smoke and irritating vapours as products of incomplete combustion. See Section 11 (Other Considerations) for information regarding the toxicity of the combustion products.		
Fire Fighting Media and Instructions	NAERG96, GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a moderate flash point above 40°C: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO₂, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

Material Release or Spill	Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Extinguish all ignition sources. Stop leak if safe to do so. Ventilate area. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Avoid contact with spilled material. Avoid breathing vapours or mists of material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Evacuate non-essential personnel. Ensure clean-up personnel wear appropriate personal protective equipment. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. Notify appropriate authorities immediately.
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Section 7. Handling and Storage

Handling	COMBUSTIBLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Properly dispose of contaminated leather articles including shoes that cannot be decontaminated. Avoid confined spaces and areas with poor ventilation. Ensure all equipment is grounded/bonded. Wear proper personal protective equipment (See Section 8).
Storage	Store away from heat and sources of ignition. Store in dry, cool, well-ventilated area. Store away from incompatible and reactive materials (See section 5 and 10). Ensure the storage containers are grounded/bonded.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - <i>The selection of personal protective equipment varies, depending upon conditions of use.</i>	
Eyes	As a minimum, safety glasses with side shields should be worn when handling this material. If product is used in an application where splashing may occur, the use of safety goggles and/or a face shield should be considered.
Body	If this material may come in contact with the body during handling and use, we recommend wearing appropriate protective clothing to prevent contact with the skin. (Contact your PPE provider for more information.)
Respiratory	A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hands	If this material may come in contact with the hands during handling and use, we recommend wearing gloves of the following material(s): nitrile, neoprene, polyvinyl alcohol (PVA), fluoro-elastomer. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Bright oily liquid.	Viscosity	1.3 - 4.1 cSt @ 40°C (104°F)
Colour	Clear to yellow / brown (may be dyed for taxation purposes).	Pour Point	Variable, -50°C to 0°C (-58°F to -32°F)
Odour	Petroleum oil like.	Softening Point	Not applicable.
Odour Threshold	Not available	Dropping Point	Not applicable.
Boiling Point	150 - 371°C (302-700°F)	Penetration	Not applicable.
Density	0.80 - 0.85 kg/L @ 15°C (59°F)	Oil / Water Dist. Coefficient	Not available
Vapour Density	4.5 (Air = 1)	Ionicity (in water)	Not applicable.
Vapour Pressure	Not available	Dispersion Properties	Not available
Volatility	Semivolatile to volatile.	Solubility	Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

Section 10. Stability and Reactivity

Corrosivity	Not available		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	Decomposition Products	May release COx, NOx, SOx, H2S, H2O, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Acute oral toxicity (LD50): 7500 mg/kg (rat).
Chronic or Other Toxic Effects	
Dermal Route:	This product contains a component (at >= 1%) that can cause skin irritation. Therefore, this product is considered to be a skin irritant. Prolonged or repeated contact may defat and dry skin, and cause dermatitis. (See Other Considerations)
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

Oral Route:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Eye Irritation/Inflammation:	This product contains a component (at $\geq 1\%$) that can cause eye irritation. Therefore, this product is considered to be an eye irritant.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product is not known to contain any components at $\geq 0.1\%$ that have been shown to cause mutagenicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a mutagen.
Reproductive Toxicity:	This product is not known to contain any components at $\geq 0.1\%$ that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at $\geq 0.1\%$ that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	ACGIH A3: animal carcinogen. [Diesel oil] (See Other Considerations)
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):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by IRIS.
Carcinogenicity (OSHA):	This product is not known to contain any chemicals at reportable quantities that are listed as carcinogens by OSHA.
Other Considerations	Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer. Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Section 12. Ecological Information

Environmental Fate	Not available	Persistence/Bioaccumulation Potential	Not available
BOD5 and COD	Not available	Products of Biodegradation	Not available
Additional Remarks No additional remark.			

Section 13. Disposal Considerations

Waste Disposal	Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.
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Section 14. Transport Information

TDG Classification	DIESEL FUEL, 3, UN1202, PGIII (CL-TDG)	Special Provisions for Transport	See Transportation of Dangerous Goods Regulations.
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Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). All components of this formulation are listed on the US EPA-TSCA Inventory. All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.
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Please contact Product Safety for more information.

DSD/DPD (Europe) Not evaluated.		HCS (U.S.A.) CLASS: Irritating substance. CLASS: Target organ effects. CLASS: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).			
ADR (Europe) (Pictograms) NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.		DOT (U.S.A) (Pictograms) Not evaluated for transport Non évalué pour le transport			
HMIS (U.S.A.)	Health Hazard (2*)	NFPA (U.S.A.) Health	2 2 0 Fire Hazard Reactivity Specific hazard	Rating	0 Insignificant
	Fire Hazard (2)			1 Slight	
	Reactivity (0)			2 Moderate	
	Personal Protection (H)			3 High	
				4 Extreme	

Section 16. Other Information

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

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
 ADR - Agreement on Dangerous goods by Road (Europe)
 ASTM - American Society for Testing and Materials
 BOD5 - Biological Oxygen Demand in 5 days
 CAN/CGA B149.2 Propane Installation Code
 CAS - Chemical Abstract Services
 CEPA - Canadian Environmental Protection Act
 CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
 CFR - Code of Federal Regulations
 CHIP - Chemicals Hazard Information and Packaging Approved Supply List
 CNS - Central Nervous System
 COD5 - Chemical Oxygen Demand in 5 days
 CPR - Controlled Products Regulations
 DOT - Department of Transport
 DSCL - Dangerous Substances Classification and Labeling (Europe)
 DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
 DSL - Domestic Substance List
 EEC/EU - European Economic Community/European Union
 EINECS - European Inventory of Existing Commercial Chemical Substances
 EPA - Environmental Protection Agency
 EPCRA - Emergency Planning and Community Right to Know Act
 FDA - Food and Drug Administration
 FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
 HCS - Hazard Communication Standard
 HMIS - Hazardous Material Information System
 IARC - International Agency for Research on Cancer
 IRIS - Integrated Risk Information System
 LD50/LC50 - Lethal Dose/Concentration kill 50%
 LDLo/LCLo - Lowest Published Lethal Dose/Concentration
 NAERG'96 - North American Emergency Response Guide Book (1996)
 NFPA - National Fire Prevention Association
 NIOSH - National Institute for Occupational Safety & Health
 NPRI - National Pollutant Release Inventory
 NSNR - New Substances Notification Regulations (Canada)
 NTP - National Toxicology Program
 OSHA - Occupational Safety & Health Administration
 PEL - Permissible Exposure Limit
 RCRA - Resource Conservation and Recovery Act
 RTECS - Registry of Toxic Effects of Chemical Substances
 SARA - Superfund Amendments and Reorganization Act
 SD - Single Dose
 STEL - Short Term Exposure Limit (15 minutes)
 TDG - Transportation Dangerous Goods (Canada)
 TDLo/TCLo - Lowest Published Toxic Dose/Concentration
 TLM - Median Tolerance Limit
 TLV-TWA - Threshold Limit Value-Time Weighted Average
 TSCA - Toxic Substances Control Act
 USEPA - United States Environmental Protection Agency
 USP - United States Pharmacopoeia
 WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS

Internet: www.petro-canada.ca/msds

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

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 8/17/2005.

Data entry by Product Safety - JDW.

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

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,
Canada V4G 1L3
Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

SECTION 1: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **CLAY STABILIZER**

PRODUCT USE: Drilling Fluid Additive

CHEMICAL FAMILY: Amine salts

WHMIS CLASSIFICATION: D2B

WORK PLACE HAZARD: Skin and Eye irritant

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: not applicable

PACKAGE GROUP: not applicable

SHIPPING NAME: not regulated

PRODUCT IDENTIFICATION NUMBER (Pin): not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENTS	PERCENT (%)	CAS #	LD ₅₀ (oral rat)	LD ₅₀ (dermal rabbit)	LC ₅₀ (inhalation rat)
1,6-Hexanediamine	30 - 60	124-09-4	750 mg/kg	1110 mg/kg	not determined
Formic Acid	10 - 30	64-18-6	1100 mg/kg	not determined	not determined

SECTION III: HEALTH HAZARDS

ROUTE OF ENTRY [XXX] Skin [XXX] Eye Contact [XXX] Inhalation [XXX] Ingestion

THRESHOLD LIMIT VALUE : not determined

SKIN CONTACT : not expected to be problem under normal conditions of use.
Liquid may cause irritation.
Due to the pH of the sample the corrosive properties of the individual components are not present.
LD₅₀ (skin, rabbit) 3700 mg/kg based on components.

INGESTION : Due to the pH of the mixture, the corrosive properties of the individual components are not present in the mixture.
LD₅₀ (oral rat) 2200 mg/kg based on components.

INHALATION : Not expected to be a problem under normal conditions of use.
Due to the pH of the mixture, individual components have rendered non-volatile.
4 hour LC₅₀ (rat) > 3200 mg/m³ based on components.

SECTION IV: TOXICOLOGICAL INFORMATION

CARINOGENICITY not determined

REPRODUCTIVE TOXICITY not determined

TERATOGENICITY not determined

MUTAGENICITY not determined

DEVELOPMENTAL TOXICITY not determined

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CLAY STABILIZER

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SECTION V: FIRST AID MEASURES

SKIN CONTACT	: In case of skin contact, immediately flush contacted area for at least 15 minutes with water. Remove contaminated clothing immediately and launder before reuse. If irritation develops consult a doctor.
EYE CONTACT	: In case of contact with eyes, flush with water for at least 15 minutes. Seek immediate medical attention.
INGESTION	: If victim is conscious, give water. Do not induce vomiting. Seek immediate medical attention.
INHALATION	: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

SECTION VI: PHYSICAL DATA

APPEARANCE	: Clear liquid
ODOR	: Odourless
SPECIFIC GRAVITY	: 1.07
BOILING POINT (°C)	: >100°
MELTING POINT (°C)	: <-35°C
PERCENT VOLATILE BY VOLUME	: not determined
SOLUBILITY IN WATER	: Soluble
EVAPORATION RATE	: not determined
VAPOR PRESSURE (mm Hg)	: not determined
VAPOR DENSITY (Air = 1)	: not determined
pH	: 9 – 10

SECTION VII: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	: >100°C (TCC)
FLAMMABLE LIMITS	: not applicable\
EXTINGUISHING MEDIA	: Water, dry chemical, foam
SPECIAL FIRE FIGHTING PROCEDURES	: Self-contained respirators required for fire-fighting personnel
UNUSUAL FIRE AND EXPLOSION HAZARDS	: none known

SECTION VIII: REACTIVITY DATA

STABILITY	[XXX] Stable	[] Unstable
INCOMPATIBILITY (Conditions to avoid)	: Strong Oxidizers	
CONDITION OF REACTIVITY	: not known	
HAZARDOUS DECOMPOSITION PRODUCTS	: CO _x , NO _x	
HAZARDOUS POLYMERIZATION	: [XXX] Will not occur	[] May occur

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CLAY STABILIZER

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SECTION IX: PREVENTIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION

Not expected to be a problem under normal use

VENTILATION

General mechanical, 10 changes per hour

PROTECTIVE GLOVES

Chemically resistant

EYE PROTECTION

Safety glasses

OTHER PROTECTIVE EQUIPMENT (Specify)

Suggest rubber apron

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Wear protective equipment.

For spills dike and pick up spilled material, dispose of in approved waste containers.

Keep out of sewers, storm drains, surface waters and soil.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in a cool, dry, well-ventilated place away from incompatible materials.

Wash thoroughly after handling.

Do not get in eyes, on skin, or on clothing.

Do not cut, grind, weld, or drill on or near this container.

Containers, even those that have been emptied, will retain product residue, always obey hazard warnings and handle empty containers as if they were full.

WASTE DISPOSAL METHOD

Dispose of contaminated product and material used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, provincial and local regulatory agencies to ascertain proper disposal procedures.

SECTION X: PREPARATION

THE INFORMATION CONTAINED HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY, EXPRESSED OR IMPLIED IS MADE.

DATE ISSUED: May 2001

SUPERSEDES: March 1997

DATE REVISED: April 1, 2000

DATE REVISED: January 2002

BY: Product Safety Committee

Review date:

March 31/03

Authorized by:

Alan Lalonde

Material Safety Data Sheet / Fiche signalétique

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SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **CAL-SEAL (EA-2)**
CHEMICAL FAMILY: Calcium Sulphate
PRODUCT USE: Cementing
WHMIS CLASSIFICATION: Not a controlled product under WHMIS
WORK PLACE HAZARD: Not applicable

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not Dangerous Goods
PACKAGE GROUP: Not applicable
PRODUCT IDENTIFICATION NUMBER (PIN): Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	LD50	LC50
Calcium Sulphate Hemihydrate	>60%	10124-36-4	Not determined	Not determined

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:

[XXX] Skin, [XXX] Eye Contact, [XXX] Inhalation, [XXX] Ingestion

SKIN CONTACT: May cause mild allergic skin reaction in susceptible individuals
EYE CONTACT: Dust may irritate eyes
INHALATION: Dust may irritate upper respiratory passages.
INGESTION: Not available
EFFECTS OF CHRONIC EXPOSURE: Prolonged or repeated skin contact may cause severe irritation or burns especially if skin is moist or if material is confined.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Immediately flush skin with water for at least fifteen (15) minutes. Remove contaminated clothing and footwear; wash before re-use. Seek medical attention. Wash dust if irritating to the eyes, skin and respiratory system.
EYE CONTACT: Immediately flush eyes with plenty of water for at least fifteen (15) minutes occasionally lifting the eyelids. Seek immediate medical attention.
INHALATION: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Get immediate medical attention.
INGESTION: If swallowed, *do not induce vomiting*. Give up to one (1) quart of water or milk to dilute. Seek immediate medical attention.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOR: White solid; powder; odorless
DENSITY (SPECIFIC GRAVITY): 2.700
BOILING POINT: Not applicable
MELTING POINT: Not applicable
WATER SOLUBILITY: 0.2% at 20° C
% VOLATILE BY VOLUME: Not applicable
EVAPORATION RATE: Not applicable
VAPOR PRESSURE (mm/Hg): Not applicable
VAPOR DENSITY (Air=1): Not applicable
pH: 10.4

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CAL-SEAL (EA-2)

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SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	Not applicable
FLAMMABLE LIMIT:	Not determined
EXTINGUISHING MEDIA:	Use media appropriate for surrounding materials.
SPECIAL FIRE FIGHTING PROCEDURES:	Self contained respirators required for fire fighting personnel.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Not applicable

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE []	
INCOMPATIBILITY (CONDITIONS TO AVOID):	None
HAZARDOUS DECOMPOSITION PRODUCTS:	None
HAZARDOUS POLYMERIZATION:	Will not occur [XXX] May occur []

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION:	Suggest NIOSH/MESA approved dust mask.
VENTILATION:	Ten (10) changes per hour suggested
PROTECTIVE GLOVES:	Suggest plastic or rubber
EYE PROTECTION:	Suggest goggles.
OTHER PROTECTIVE EQUIPMENT:	Suggest rubber apron.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Store in a dry location to protect product quality. Avoid creating or inhaling dust. Avoid contact with skin, eyes and clothing.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:

Use protective equipment. Sweep up to remove. Avoid creating or inhaling dust.

WASTE DISPOSAL METHOD:

If not contaminated, reuse product. Get approval from landfill operator to transport to sanitary landfill.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: March, 22, 1989

BY: Product Safety Committee

DATE REVISED: April 1, 2000

Review date:

March 31/03

Authorized by:

Alan Lelaide

Material Safety Data Sheet / Fiche signalétique

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EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **BIG BEAR DIAMOND DRILL ROD GREASE**
CHEMICAL FAMILY: Hydrocarbon
WHMIS CLASSIFICATION: Not regulated
WORK PLACE HAZARD: Not applicable

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not regulated
PACKAGE GROUP: Not applicable
PRODUCT IDENTIFICATION NUMBER (PIN): Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	LD50	LC50
Severely hydrotreated naphthenic oils	< 75.00%	64742-52-5	>3 g/kg (Dermal Rabbit) >5 g/kg (Oral Rat)	N/D
Barium soap	< 35.00%	68201-19-4	Not determined	

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:
[XXX] Skin, [] Eye Contact, [] Inhalation, [] Ingestion

SKIN CONTACT: Acute exposure is believed to be minimally irritating

EYE CONTACT: Acute exposure is believed to be minimally irritating.

INHALATION: Believed to be minimally irritating if not in excess of permissible concentrations; see Section VIII.

INGESTION: Not available

CHRONIC OVEREXPOSURE: Not determined

IRRITATION INDEX: SKIN: Believed to be 1.0 - 2.0/8.0 (Rabbit); slightly irritating
EYES: Believed to be <15/110 (Rabbit); no appreciable effect

SYMPTOMS OF EXPOSURE: None expected other than possible minor irritation. Considered practically non-toxic.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: None considered necessary.

EYE CONTACT: As with most foreign materials, should eye contact occur, flush eyes with plenty of water.

INHALATION: None considered necessary.

INGESTION: None considered necessary. Do not induce vomiting.

OTHER INSTRUCTIONS: In some cases of ingestion and/or inhalation, medical attention should be obtained.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOR: Brownish yellow, fibrous grease

DENSITY (SPECIFIC GRAVITY): >1.0

BOILING POINT: 700° F

MELTING POINT: 400° F

WATER SOLUBILITY: Negligible

% VOLATILE BY VOLUME: Not determined

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BIG BEAR DIAMOND DRILL ROD GREASE

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EVAPORATION RATE:	Not determined
VAPOR PRESSURE (mm Hg):	Not determined (low)
VAPOR DENSITY (Air =1):	>1.0
pH:	Not applicable
VISCOSITY:	NLGI No. 3-4 grease

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	>350° F (COC Method)
FLAMMABLE LIMIT:	Not determined
EXTINGUISHING MEDIA:	According to the National Fire Protection Association Guide, use water spray. Dry chemical, Foam, Carbon Dioxide CO ₂ . Water or foam may cause frothing.
SPECIAL FIRE FIGHTING PROCEDURES:	Use water to cool fire-exposed containers. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for persons attempting to stop the leak. See Hazardous Decomposition Products, Section VII.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	None

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE []	Info not available
INCOMPATIBILITY (CONDITIONS TO AVOID):	Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS:	This material decomposes at a high temperature to form carbon monoxide, carbon dioxide, aldehydes and ketones, combustion products of nitrogen and sulphur.
HAZARDOUS POLYMERIZATION:	Will not occur [XXX] May occur []

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION:	None required if exposures are within the permissible concentrations. See below
VENTILATION:	Natural dilution
PROTECTIVE GLOVES:	Neoprene
EYE PROTECTION:	Chemical type goggle or face shield optional
OTHER PROTECTIVE EQUIPMENT:	Standard work clothing and work shoes.
PERMISSIBLE CONCENTRATIONS: AIR:	5mg/cubic metre of air for mineral oil mist averaged over an 8 hour daily exposure (ACGIH 1986.- 87)

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Exposed persons should exercise reasonable personal cleanliness; this includes cleansing exposed skin areas several times daily with soap and water and laundering or dry cleaning soiled work clothing at least weekly. Minimum feasible handling temperatures should be maintained. Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.



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BIG BEAR DIAMOND DRILL ROD GREASE

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STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:

Contain spill if possible. Wipe up or absorb on suitable material and shovel up.

WASTE DISPOSAL METHOD:

Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures and processes may influence waste classification. Disposal should be in accordance with applicable federal, provincial and local regulations.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: September 17, 1993

DATE REVISED: April 1, 2000

BY: Product Safety Committee

Review date:

March 31/03

Authorized by:

Alan Lalonde

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,
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Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **550X® POLYMER**

CHEMICAL FAMILY: Anionic water soluble polymer

PRODUCT USE: Drilling mud additive

WHMIS CLASSIFICATION: Not WHMIS regulated

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not applicable

PACKAGE GROUP: Not applicable

UN NUMBER (PIN): Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	LD50	LC50
No hazardous ingredients				

SECTION III: HEALTH HAZARDS

ROUTES OF ENTRY

[XXX] Skin [XXX] Eye Contact [XXX] Inhalation [XXX] Ingestion

THRESHOLD LIMIT VALUE: Not determined

SKIN CONTACT: No effects of exposure expected due to contact.
Prolonged contact may cause slight skin irritation or dermatitis in some individuals.

EYE CONTACT: No effects of exposure expected with the exception of mechanical irritation.

INGESTION: No adverse effects expected.
Product may swell in throat causing choking.

INHALATION: May cause sneezing, slight irritation of nose and throat.

SECTION IV: FIRST AID MEASURES

SKIN CONTACT: Wash with soap and water as a precaution. In case of persistent skin irritation, consult a physician.

EYE CONTACT: Rinse thoroughly with plenty of water, also under the eyelid. In case of persistent eye irritation, consult a physician.

INGESTION: The product is not considered toxic based on studies on laboratory animals. Do not induce vomiting, give 2-3 glasses of water.

INHALATION: Move to fresh air. If not breathing give artificial respiration.
Seek medical attention.

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550X® POLYMER

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SECTION V: PHYSICAL DATA

APPEARANCE	White granular solid
ODOR	None
SPECIFIC GRAVITY	not determined
BOILING POINT (°C)	Not applicable
MELTING POINT (°C)	Not determined
SOLUBILITY IN WATER	Forms a gel
PERCENT VOLATILE BY VOLUME	Not determined
EVAPORATION RATE	Not determined
VAPOR PRESSURE (mm Hg)	Not determined
VAPOR DENSITY (Air=1)	Not determined
pH	4 – 9 @ 5g/L

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	not applicable
FLAMMABLE LIMITS	Not determined
EXTINGUISHING MEDIA	Not determined
SPECIAL FIRE FIGHTING PROCEDURES	Aqueous solutions or powders that become wet render surfaces extremely slippery.
UNUSUAL FIRE AND EXPLOSION HAZARDS	No special equipment required.

SECTION VII: REACTIVITY DATA

STABILITY	[XXX] Stable [] Unstable
INCOMPATIBILITY (Conditions to avoid)	Oxidizing agents
CONDITIONS OF REACTIVITY	Not known
HAZARDOUS DECOMPOSITION PRODUCTS	NO _x , CO _x
HAZARDOUS POLYMERIZATION	[XXX] Will not occur [] May occur

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550X® POLYMER

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SECTION VIII: PREVENTIVE MEASURES

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	Dust masks are recommended where concentration of total dust is more than 10 mg/m ³
VENTILATION	General mechanical
PROTECTIVE GLOVES	Chemically resistant
EYE PROTECTION	Safety glasses with side shields
OTHER PROTECTIVE EQUIPMENT (Specify)	Not known

ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE THE MATERIAL IS SPILLED OR RELEASED

Do not flush with water. Clean up promptly by sweeping or vacuum
Keep in suitable and closed containers for disposal.
After cleaning, flush away trace with water.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Wash hands before breaks and at the end of the day. Keep in a cool dry place (0 – 30 °C)

WASTE DISPOSAL METHOD

Can be land filled or incinerated, when in compliance with local, provincial and federal regulations.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

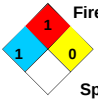
DATE ISSUED: August, 2001

DATE REVISED: January 2005

BY: Product Safety Committees



Material Safety Data Sheet

NFPA	HMIS (U.S.A.)	Rating	Protective Clothing	DOT (pictograms)
 Health 1 Fire Hazard 1 Reactivity 0 Specific hazard 0	Health Hazard (1) Fire Hazard (1) Reactivity (0) Personal Protection (B)	0 Insignificant 1 Slight 2 Moderate 3 High 4 Extreme		

Section I. Chemical Product and Company Identification

Product Name	DURON* XL 0W-30 ENGINE OIL	Code	420-050, DXL03
Synonym	RDL3293	DSL	On the DSL.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	TSCA	On TSCA list.
Material Uses	DURON* XL 0W30 is an engine oil for use in 4-stroke compression and spark ignition engines under extended ambient conditions, including temperatures below -40°C. Mobile equipment applications include heavy duty highway and off-highway operations, as well as smaller trucks and cars. The product may also be used in many types of wet clutch transmissions and hydraulic systems.	In case of Emergency	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

Section II. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	CAS #	% (W/W)	TLV-TWA(8 h)	STEL	CEILING
1) A mixture of synthetic high viscosity index paraffinic hydrocarbons, severely hydrotreated paraffinic oil, and additives.	Mixture	100	5 mg/m ³ (oil mist)	10 mg/m ³ (oil mist)	Not established
Manufacturer Recommendation	Not applicable				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section III. Hazards Identification.

Potential Health Effects	Non irritating to slight transient irritation to skin and eyes, but no permanent damage. Relatively non-toxic via ingestion. This product has a low vapour pressure and is not expected to present an inhalation exposure at ambient conditions. Upon heating to high temperatures, or mechanical actions which may produce vapours or mists, inhalation of product may cause irritation of the breathing passages. For more information, refer to Section 11.
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Section IV. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention.
Skin Contact	Remove contaminated clothing - launder before reuse. Wash gently and thoroughly the contaminated skin with running water and non-abrasive soap. Seek medical attention.
Inhalation	Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform artificial respiration. Allow the victim to rest in a well ventilated area. Seek medical attention.
Ingestion	DO NOT induce vomiting because of danger of aspirating liquid into lungs. Seek medical attention.
Note to Physician	Not available

Section V. Fire-fighting Measures

Flammability	May be combustible at high temperature.	Flammable Limits	Not available.
Flash Points	Open Cup: 225°C (Cleveland)	Auto-Ignition Temperature	Fire Point: 247°C
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.
Products of Combustion	Carbon oxides (CO, CO ₂), smoke and irritating vapours as products of incomplete combustion.		

Fire Fighting Media and Instructions	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. SMALL FIRE: use DRY chemicals, foam, water spray or CO ₂ . LARGE FIRE: use water spray, fog or foam. 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.
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Section VI. Accidental Release Measures

Material Release or Spill	NAERG96, GUIDE 171, Substances (low to moderate hazard). ELIMINATE ALL IGNITION SOURCES. Avoid contact. Stop leak if 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 used absorbent in closed metal containers for later disposal or burn absorbent in a suitable combustion chamber. DO NOT FLUSH TO SEWERS, STREAMS OR OTHER BODIES OF WATER. Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.
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Section VII. Handling and Storage

Handling	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.
Storage	Store in tightly closed containers in cool, dry, isolated, well-ventilated area, and away from incompatibles.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection -	<i>The selection of personal protective equipment varies, depending upon conditions of use.</i>
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.
Body	Wear appropriate clothing to prevent skin contact. As a minimum long sleeves and trousers should be worn.
Respiratory	Where concentrations in air may exceed the occupational exposure limits given in Section 2 (and those applicable to your area) 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.
Hands	Wear appropriate chemically protective gloves. When handling hot product ensure gloves are heat resistant and insulated.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section IX. Physical and Chemical Properties

Physical State and Appearance	Viscous liquid.	Viscosity	66 cSt @ 40°C
Colour	Amber.	Pour Point	-51°C
Odour	Mild petroleum oil like.	Softening Point	Not applicable.
Odour Threshold	Not available.	Dropping Point	Not applicable.
Boiling Point	Not available	Penetration	Not applicable.
Density	0.8423 kg/L @ 15°C (59°F).	Oil / Water Dist. Coeff.	Not available
Vapour Density	Not available.	Ionicity (in water)	Not available
Vapour Pressure	Negligible at ambient temperature and pressure.	Dispersion Properties	Not available
Volatility	Non-volatile.	Solubility	Insoluble in water.

Section X. Stability and Reactivity

Corrosivity	Copper corrosion, 3h, 100°C (ASTM D0130): 1a.		
Stability	The product is stable under normal handling and storage conditions.	Hazardous Polymerization	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Incompatible with oxidizing agents, acids, halogens and halogen compounds.	Decomposition Products	CO _x , SO _x , H ₂ S, CaO _x , ZnO _x , aldehydes, alkyl mercaptans, sulfides, methacrylate monomers, smoke and irritating vapours as products of incomplete combustion.

Section XI. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	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).
Chronic or Other Toxic Effects	
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 give 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 XII. Ecological Information

Environmental Fate	Not available	Persistence/ Bioaccumulation Potential	Not available
BOD5 and COD	Not available.	Products of Biodegradation	Not available.
Additional Remarks	No additional remark.		

Section XIII. Disposal Considerations

Waste Disposal	Spent/used/waste 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.
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Section XIV. Transport Information

DOT Classification	Not regulated.	Special Provisions for Transport	Not applicable.
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Section XV. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). All components of this formulation are listed on the US EPA-TSCA Inventory. All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.
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Please contact Product Safety for more information.

DSD/DPD (EEC)

Not controlled under DSCL (Europe).

WHMIS (Canada)

Not controlled

**ADR (Europe)
(Pictograms)****TDG (Canada)
(Pictograms)****Section XVI. Other Information****References**

Available upon request.

* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
 ADR - Agreement on Dangerous goods by Road (Europe)
 ASTM - American Society for Testing and Materials ()
 BOD5 - Biological Oxygen Demand in 5 days
 CAN/CGA B149.2 Propane Installation Code
 CAS - Chemical Abstract Services
 CEPA - Canadian Environmental Protection Act
 CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
 CFR - Code of Federal Regulations
 CHIP - Chemicals Hazard Information and Packaging Approved Supply List
 COD5 - Chemical Oxygen Demand in 5 days
 CPR - Controlled Products Regulations
 DOT - Department of Transport
 DSCL - Dangerous Substances Classification and Labeling (Europe)
 DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
 DSL - Domestic Substance List
 EEC/EU - European Economic Community/European Union
 EINECS - European Inventory of Existing Commercial Chemical Substances
 EPCRA - Emergency Planning and Community Right to Know Act
 FDA - Food and Drug Administration
 FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
 HCS - Hazardous Communication System
 HMIS - Hazardous Material Information System
 IARC - International Agency for Research on Cancer

IRIS - Integrated Risk Information System
 LD50/LC50 - Lethal Dose/Concentration kill 50%
 LDLo/LCLo - Lowest Published Lethal Dose/Concentration
 NAERG'96 - North American Emergency Response Guide Book (1996)
 NFPA - National Fire Prevention Association
 NIOSH - National Institute for Occupational Safety & Health
 NPRI - National Pollutant Release Inventory
 NSNR - New Substances Notification Regulations (Canada)
 NTP - National Toxicology Program
 OSHA - Occupational Safety & Health Administration
 PEL - Permissible Exposure Limit
 RCRA - Resource Conservation and Recovery Act
 SARA - Superfund Amendments and Reorganization Act
 SD - Single Dose
 STEL - Short Term Exposure Limit (15 minutes)
 TDG - Transportation Dangerous Goods (Canada)
 TDLo/TCLo - Lowest Published Toxic Dose/Concentration
 TLM - Median Tolerance Limit
 TLV-TWA - Threshold Limit Value-Time Weighted Average
 TSCA - Toxic Substances Control Act
 USEPA - United States Environmental Protection Agency
 USP - United States Pharmacopoeia
 WHMIS - Workplace Hazardous Material Information System

For Copy of MSDS**Lubricants:****Western Canada, telephone: 1-800-661-1199; fax: (780) 464-9564****Ontario & Central Canada, telephone: 1-800-268-5850 and (905) 822-4222; fax: 1-800-201-6285****Quebec & Eastern Canada, telephone: 1-800-576-1686; fax: 800-201-6285****For Product Safety Information: (905) 804-4752****Prepared by Product Safety - TAR on 3/13/2001.****Data entry by Product Safety - JDW.**

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

Material Safety Data / Fiche signalétique

WESTCOAST DRILLING SUPPLIES LTD.

8069 River Way, Delta, British Columbia,
Canada V4G 1L3
Ph. (604) 940-6050 Fax (604) 940-6080

EMERGENCY 1-800-665-6645

SECTION I: IDENTIFICATION OF PRODUCT

PRODUCT NAME: **X-TRA GEL**
CHEMICAL FAMILY: Sodium Montmorillonite
WHMIS CLASSIFICATION: Class D-2(A)
WORK PLACE HAZARD: Potential Carcinogen; contains free silica

TRANSPORTATION OF DANGEROUS GOODS (TDGR)

CLASSIFICATION: Not Dangerous Goods
PACKAGE GROUP: Not applicable
PRODUCT IDENTIFICATION NUMBER (PIN): Not applicable

SECTION II: HAZARDOUS INGREDIENTS

INGREDIENT	PERCENTAGE	CAS NUMBER	OSAH PEL	ACGIH TLV
Bentonite		1302-78-9	5 mg/M	Not applicable
Quartz (Silica)		14808-60-7	10 mg/M	0.1 mg/M
Crystobalite		14464-46-1	10 mg/M	0.05 mg/M
Tridymite		15468-32-3	10 mg/M	0.05 mg/M

SECTION III: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:

[] Skin, [] Eye Contact, [XXX] Inhalation, [] Ingestion

ACUTE - SHORT TERM EXPOSURE: Cough if exposed to dust at levels higher than TLV's.
CHRONIC - LONG TERM EXPOSURE: May lead to development of silicosis or other respiratory problems if consistently exposed to free silica containing airborne bentonite.

SECTION IV: FIRST AID MEASURES

No first aid measures are suggested for chronic (long term exposure). For acute (short term exposure) remove patient from dusty environment.

SECTION V: PHYSICAL DATA

APPEARANCE AND ODOR: Pale gray to buff powder or granules; Odorless.
DENSITY (SPECIFIC GRAVITY): 2.35
BOILING POINT: Not applicable
MELTING POINT: 788° C
WATER SOLUBILITY: Insoluble; forms colloidal suspension.
% VOLATILE BY VOLUME: Not applicable
EVAPORATION RATE: Not applicable
VAPOR PRESSURE: (mm Hg) Not applicable
VAPOR DENSITY: (Air = 1) Not applicable
pH: 7 - 6

SECTION VI: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Not applicable
FLAMMABLE LIMIT: Not applicable

**WESTCOAST DRILLING SUPPLIES LTD.**

8069 River Way, Delta, British Columbia, Canada V4G 1L3

Phone: (604) 940-6050 · Fax: (604) 940-6080

Toll Free: 1-800-665-6645

X-TRA GEL

Page 2 of 2

EXTINGUISHING MEDIA:	Not applicable
SPECIAL FIRE FIGHTING PROCEDURES:	Not applicable
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Not applicable

SECTION VII: REACTIVITY DATA

STABLE [XXX] INSTABLE []

INCOMPATIBILITY (CONDITIONS TO AVOID): None

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur [XXX] May occur []

SECTION VIII: PREVENTATIVE MEASURES

RESPIRATORY PROTECTION:	NIOSH/MSHA approved respirators for silica bearing dust.
VENTILATION:	Yes if particular; Personal air supply may be useful.
PROTECTIVE GLOVES:	None required
EYE PROTECTION:	Suggest goggles
OTHER PROTECTIVE EQUIPMENT:	None required

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Avoid breathing dust; wear an approved respirator. Practice reasonable caution and personal cleanliness. Avoid eye contact.

STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:

Vacuum or sweep up if dry. Avoid flushing with water as material may become extremely slippery.

WASTE DISPOSAL METHOD:

Dispose of material in a manner to prevent generating dust.

SECTION IX: PREPARATION

The information contained herein is given in good faith, but no warranty, expressed or implied is made.

DATE ISSUED: November 10, 1988

BY: Product Safety Committee

DATE REVISED: April 1, 2000

Review date: March 31/03
Authorized by: Alan L. Lauder

Appendix D

Hazardous Waste

ENVIRONMENTAL GUIDELINE FOR General management of Hazardous waste



GUIDELINE: GENERAL MANAGEMENT OF HAZARDOUS WASTE IN NUNAVUT

AS AMENDED BY:

USE OF GUIDELINE

A guideline is not law and is therefore not enforceable. It does however, assist an inspector to determine what action(s) may be required of him or her. Paragraph 2.2(c) of the *Environmental Protection Act* allows the Minister to "develop, co-ordinate and administer" guidelines. The Act [subsection 5(1)] makes it an offence to discharge a contaminant into the environment, subject to some exceptions [subsection 5(3)]. When a discharge occurs and it is inconsistent with the guidelines, the discharge is considered an unacceptable risk. The inspector may then consider issuing an order or laying an information.

A guideline allows for some leniency in applying the law. A court would probably be inclined to consider the application of a guideline favorably because the public is aware of the standards they are expected to meet.

This Guideline is not law.
It is prepared by Environmental Protection Service,
Department of Sustainable Development
Government of the Nunavut

Guideline for the General Management of Hazardous Waste in Nunavut

1 Introduction

1.1 Definitions

2 Roles and Responsibilities

2.1 Environmental Protection Service

2.2 Generators of Hazardous Waste

2.3 Carriers of Hazardous Waste

2.4 Receivers of Hazardous Waste

2.5 Other Regulatory Agencies

3 Storage and Management of Hazardous Waste

3.1 General

3.2 General Requirements for Storage Containers

3.3 General Requirements for Storage Facilities

3.4 Registering a Hazardous Waste Management Facility

3.5 Registering Hazardous Waste Generators, Carriers and Receivers

3.6 Waste Manifest Requirements

4 Waste Management

4.1 Pollution Prevention

4.2 Treatment or Disposal

4.3 Disposal Outside of Nunavut

4.4 Alternative Management Methods

5 Conclusion

Schedule 1: Registration Volumes

6 Bibliography

Appendices

GUIDELINE FOR THE GENERAL MANAGEMENT OF HAZARDOUS WASTE IN NUNAVUT

1 Introduction

Waste is produced in the normal course of operation of any industrial, commercial or institutional operation. Because of their chemical, physical or biological properties, some wastes are more dangerous than others. These are known as a hazardous waste and require special handling and disposal to prevent impact on human health and the environment.

This guideline has been developed by the Environmental Protection Service of the Department of Sustainable Development. Its intent is to:

- provide information for the proper management of hazardous waste in Nunavut,
- increase awareness of hazardous waste in Nunavut, and
- establish a "cradle to grave" monitoring system for hazardous waste from generation to final disposal.

Section 2.2 of the *Environmental Protection Act* (EPA) gives the Minister of Sustainable Development of the Government of Nunavut (GN) the authority to develop, coordinate and administer guidelines. This guideline complements existing acts and regulations concerning hazardous waste which should be consulted for interpretation and application. Section 2.5 of the guideline provides additional information on regulatory roles and responsibilities.

This guideline is for the general management of hazardous waste and should be read in conjunction with applicable specific hazardous waste guidelines. Contact the Environmental Protection Service for a listing of these guidelines.

1.1 Definitions

<i>Carrier</i>	Any person engaged in the transport of hazardous waste whether or not for hire or reward.
<i>Commercial</i>	Actions undertaken for hire or reward.
<i>Commissioner's Land</i>	Lands in Nunavut that have been transferred by Order in-Council to the Government of Nunavut. This includes highways, block land transfers and most lands within municipalities.
<i>Consignor</i>	A person who offers a consignment of hazardous waste for transport.
<i>Contaminant</i>	Any noise, heat, vibration or substance and includes such other substances as the Minister may prescribe that, where discharged into the environment, (a) endangers the health, safety or welfare of persons, (b) interferes or is likely to interfere with normal enjoyment of life or property, (c) endangers the health of animal life, or

d) causes or is likely to cause damage to plant life or property.
Environmental Protection Act

<i>Dangerous goods</i>	Any product, substance or organism included by its nature or by the <i>Transportation of Dangerous Goods Regulations</i> (TDGR) in any of the classes listed in the schedule provided in the <i>Transportation of Dangerous Goods Act</i> (TDGA). Transportation of Dangerous Goods Act (Canada)
<i>Empty container</i>	A container that has been emptied, to the greatest extent possible, using regular handling procedures, but its contents shall not exceed 1% of the container's original capacity or 2 litres, whichever is less. This does not include containers which previously contained mercury or class 2.3, 5.1, or 6.1 materials of TDGR.
<i>Generator</i>	The owner or person in charge, management or control of a hazardous waste at the time it is generated or a facility that generates hazardous waste.
<i>Hazardous waste</i>	A contaminant which is a dangerous good that is no longer used for its original purpose and is intended for recycling, treatment, disposal or storage. A hazardous waste does not include a contaminant that is: (a) household in origin; (b) included in class 1, Explosives or class 7, Radioactive materials of TDGR; (c) exempted as a small quantity; (d) an empty container; or (e) intended for disposal in a sewage system or by landfilling that meet the applicable standards set out in schedules I, III or IV of the <u>Guideline for Industrial Waste Discharges in Nunavut</u>.
<i>Hazardous waste management facility</i>	A facility which is used for the collection, storage, treatment, recycling or disposal of hazardous waste.
<i>Incompatible waste</i>	Hazardous wastes which, when in contact with one another or other substances under normal conditions of storage or transportation, could react to produce heat, gas, fire, explosion, corrosive substances or toxic substances.
<i>Landfilling</i>	The deposit of waste, on land, as described in the GN Department of Community Government and Transportation's document <u>Guidelines for the Planning, Design, Operation & Maintenance of Solid Waste Modified Landfill Sites in the Northwest Territories</u> .
<i>Long term storage</i>	The storage of hazardous waste for a period of 180 days or more but does not include materials in transit.
<i>Manage</i>	To handle, transport, store, recycle, treat, destroy or dispose of hazardous waste.

<i>Receiver</i>	A person to whom a quantity of hazardous waste is being or intended to be transported. Also referred to as a consignee.
<i>Sewage system</i>	A system for the collection, transmission, treatment or disposal of any liquid waste containing animal, vegetable, mineral, human or chemical matter in solution or in suspension.
<i>Small quantity</i>	Hazardous waste that is generated in an amount that is less than 5 kilograms per month if a solid or 5 litres per month if a liquid; and where the total quantity accumulated at any one time does not exceed 5 kilograms or 5 litres. This does not apply to wastes that are mercury or in classes 2.3, 5.1 or 6.1 of TDGR. These wastes must be generated in an amount less than 1 kilogram per month if a solid or 1 litre per month if a liquid; and where the total quantity accumulated at any one time does not exceed 1 kilogram or 1 litre.
<i>Transport authority</i>	The regulations controlling the management of hazardous waste under that mode of transport. These include: Road and rail - <i>Transportation of Dangerous Goods Act (TDGA) and Regulations (TDGR)</i>. Air - <i>International Civil Aviation Organization Technical Instructions (ICAO)</i>. Marine - <i>International Maritime Dangerous Goods Code (IMDG)</i>.
<i>TDGA/TDGR</i>	The <i>Transportation of Dangerous Goods Act and Regulations (Canada)</i> .
<i>Treatment or Treat</i>	The handling or processing of a hazardous waste in such a manner as to change the physical, chemical or biological character or composition of the hazardous waste in order to eliminate or reduce: (a) one or more environmental hazard of the waste; and/or (b) the volume.

2 Roles and Responsibilities

2.1 Environmental Protection Service

The Environmental Protection Service (EPS) of the Department of Sustainable Development is the Government of Nunavut's (GN) agency responsible for initiatives which control the discharge of contaminants and their impact on the natural environment. EPS is responsible for ensuring that environmentally acceptable management procedures, emission levels and disposal methods are maintained. By practice EPS programs are applied primarily to Commissioner's Land, lands administered by municipal governments or GN undertakings. Legislative authority is provided by the *Environmental Protection Act (EPA)* and *Pesticide Act*. Contact EPS for a listing of relevant regulations and guidelines.

EPS monitors the movement of hazardous waste from the generator to final disposal through use of a tracking document called a waste manifest. A waste manifest form must

accompany all hazardous waste in transit regardless of the means of transport. In order to complete the manifesting requirements, all parties (the generator, carrier, receiver) must be registered by EPS and the registration number entered in the appropriate location on the waste manifest form. Registration numbers and waste manifest forms are available from EPS.

Under the EPA, the *Spill Contingency Planning and Reporting Regulations* set the standards for reporting spills of contaminants and preparing spill contingency plans.

2.2 Generators of Hazardous Waste

The responsibility for proper waste management rests with the generator and should be considered part of the cost of doing business.

The generator is ultimately responsible for ensuring hazardous waste will be properly managed from the time it is generated to final disposal. Waste must be properly stored, transported, treated and disposed. Contractors can manage waste on behalf of the generator however, the generator is responsible for ensuring, in advance, that the waste management method is acceptable.

In general, the generator is responsible for the following:

- Classifying, labeling and storing the hazardous waste properly.
- If waste is to be transported off site the generator should:
 - register as a generator of hazardous waste;
 - ensure a waste manifest is properly completed and accompanies the shipment and
 - ensure the waste is transported by a registered hazardous waste carrier to a registered receiver.
- Registering their hazardous waste management facility, if required.
- Ensuring the proper disposal of hazardous waste by an acceptable method.
- Ensuring workers are trained in the management of hazardous waste including emergency response in the event of a discharge.
- Complying with all other regulatory requirements for hazardous waste management including transportation, occupational health and public health.

2.3 Carriers of Hazardous Waste

Carriers must be registered with EPS prior to transporting hazardous waste. Hazardous waste must be transported in accordance with the appropriate transport authority: *Transportation of Dangerous Goods Regulations* (TDGR); *International Civil Aviation Organization* (ICAO) or *International Maritime Dangerous Goods Code* (IMDG). TDGR requires that drivers be trained in the aspects of transporting dangerous goods related to their assigned duties.

2.4 Receivers of Hazardous Waste

Receivers (consignees) of hazardous waste in Nunavut must be registered with EPS as a receiver. The operator of a hazardous waste management facility in Nunavut may be required to register the facility with EPS. Section 3.4 provides information on registering a hazardous waste management facility.

2.5 Other Regulatory Agencies

The following agencies are involved in activities relevant to hazardous waste management in Nunavut:

The Transportation-Motor Vehicles Division of the GN Department of Community Government and Transportation is responsible for administering the *Transportation of Dangerous Goods Act and Regulations* (Canada). The Department is also responsible for driver, vehicle and load safety under additional transport legislation.

Under the *Safety Act, Occupational Health and Safety Regulations* address the safety of workers and the work place. The Act states that the employer shall maintain their establishment and take all reasonable precautions to ensure the safety and health of every person in the establishment. The Regulations also prescribe standards for protective clothing and equipment to be used by workers. *Work Site Hazardous Materials Information System Regulations* (WHMIS) were adopted to ensure employee training and safe storage and handling of controlled products at the employer's work site. Consultation with a Safety Officer from the Prevention Services Division of the Workers' Compensation Board is the responsibility of every waste generator or employer.

The Office of the Fire Marshal has authority over the storage of flammable, combustible and hazardous materials under the National Fire Code. Consult with the GN Department of Community Government and Transportation's regional Fire Marshal or your community Fire Chief.

Waste management activities may affect public health. Environmental Health Officers of the regional Public Health Boards should be consulted regarding requirements under the *Public Health Act*.

The GN Department of Community Government and Transportation (CG&T) administers Commissioner's Lands. CG&T's responsibility includes the granting of leases, licences and land use permits on these lands and is also involved in the planning, funding, operation and maintenance of municipal infrastructure such as landfills and sewage treatment systems.

Indian and Northern Affairs Canada is responsible for hazardous waste management on federal lands through the *Territorial Lands Act* and *NWT/Nunavut Waters Act*.

Environment Canada is responsible for the management of hazardous waste from federal facilities and lands under the *Canadian Environmental Protection Act* (CEPA). CEPA regulates the release to the environment and storage of polychlorinated biphenyls (PCBs) under the *Chlorobiphenyls Regulation, Storage of PCB Material Regulations, and Federal Mobile PCB Treatment and Destruction Regulations*. Because they regulate these areas, sections 3.2, 3.3, 3.4 and 4.4 of this guideline do not apply to PCBs. International

shipments of waste dangerous goods are monitored under the *Export and Import of Hazardous Waste Regulations* and the *PCB Waste Export Regulations*.

The National Energy Board regulates frontier exploration, drilling, production and inter-jurisdictional transmission in the oil and gas industry. The management of land based drill sumps is in conjunction with the appropriate land regulator.

Natural Resources Canada has the authority to administer explosives under the *Explosive Act*. Canadian Nuclear Safety Commission (formerly the Atomic Energy Control Board) administers the handling and disposal of radioactive materials in Canada and licenses institutions and companies to possess and use radioactive materials.

Under land claim agreements, renewable resource management institutions have been given broad authority for land use planning, impact assessment, and administration of land and water activities in settlement areas outside municipal boundaries. Through the setting of terms and conditions in licensing and permitting procedures, such institutions will have authority over waste disposal.

Figure 1 provides a flow chart to assist in determining the primary regulatory contact for hazardous waste management. Contact the Environmental Protection Service if assistance is required.

3 Storage and Management of Hazardous Waste

3.1 General

The definition of hazardous waste in this guideline incorporates the term "dangerous goods" which is defined in the Transportation of *Dangerous Goods Act* (Canada). The Transportation of Dangerous Goods Regulations (TDGR) has a system for classifying dangerous goods. Because the term "dangerous goods" is used in the definition of hazardous waste, the classification system used in TDGR can be applied to hazardous waste. Appendix A indicates the 9 chemical classes used.

Hazardous waste must not be mixed or diluted with any substance or divided into smaller quantities to avoid meeting the definition of a hazardous waste.

Figure 2 is a flow chart illustrating the decision process for managing a hazardous waste under this guideline.

3.2 General Requirements for Storage Containers

Hazardous waste should be stored in containers according to the following:

- In the original containers, where possible, or in containers manufactured for the purpose of storing hazardous waste. The containers must be sound, sealable and not damaged or leaking. The Transport Authority regulates container specifications.
- Clearly labelled according to the requirements of the Work Site Hazardous Materials Information System (WHMIS) of the *Safety Act* or the relevant Transport Authority, if transport is planned.
- Bulked into 16 gauge or equivalent metal or plastic 205 litre drums, as appropriate.
- The containers should be sealed or closed at all times, unless in use.

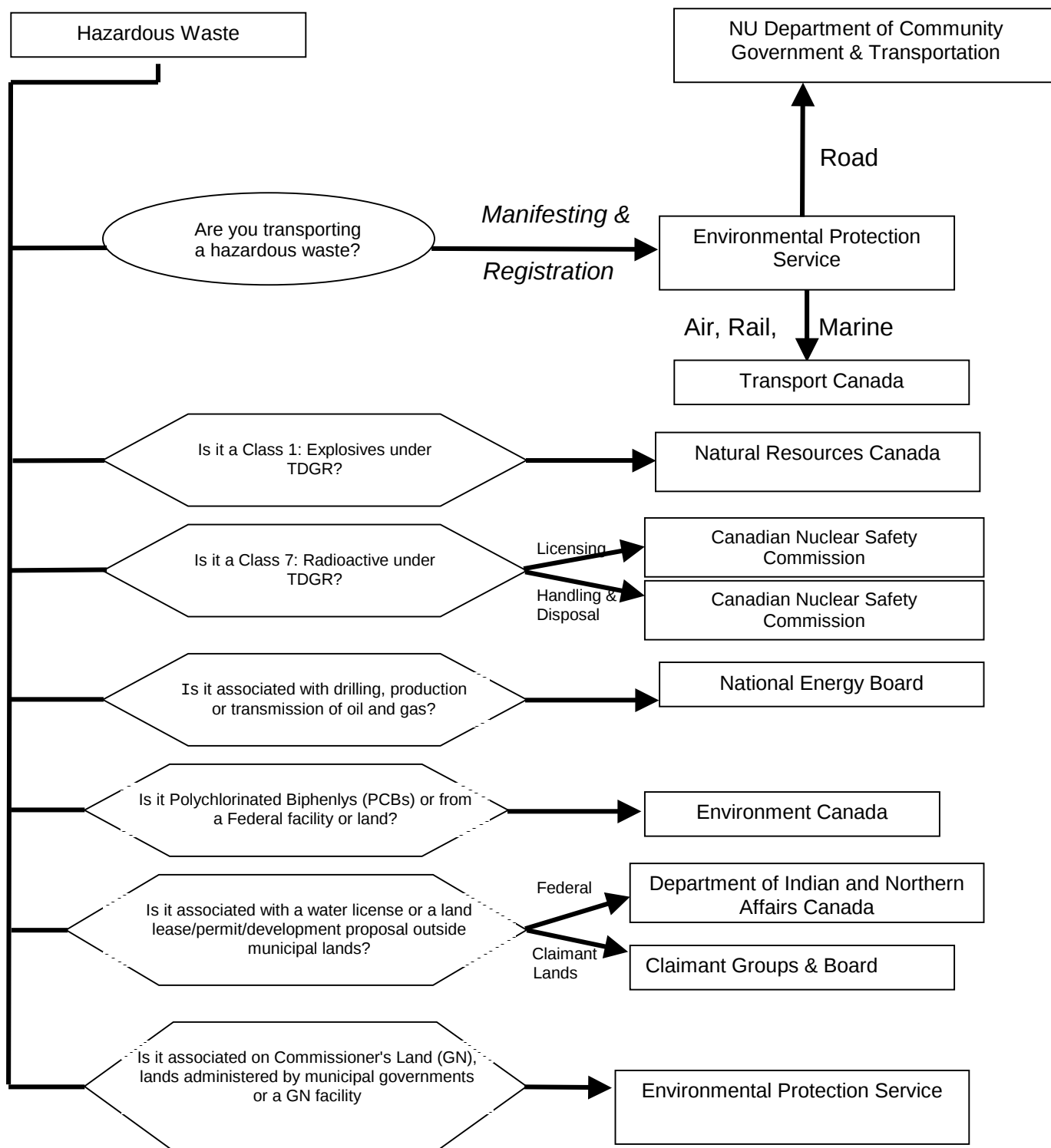


Figure 1: Primary Regulatory Contact for Hazardous Waste Management

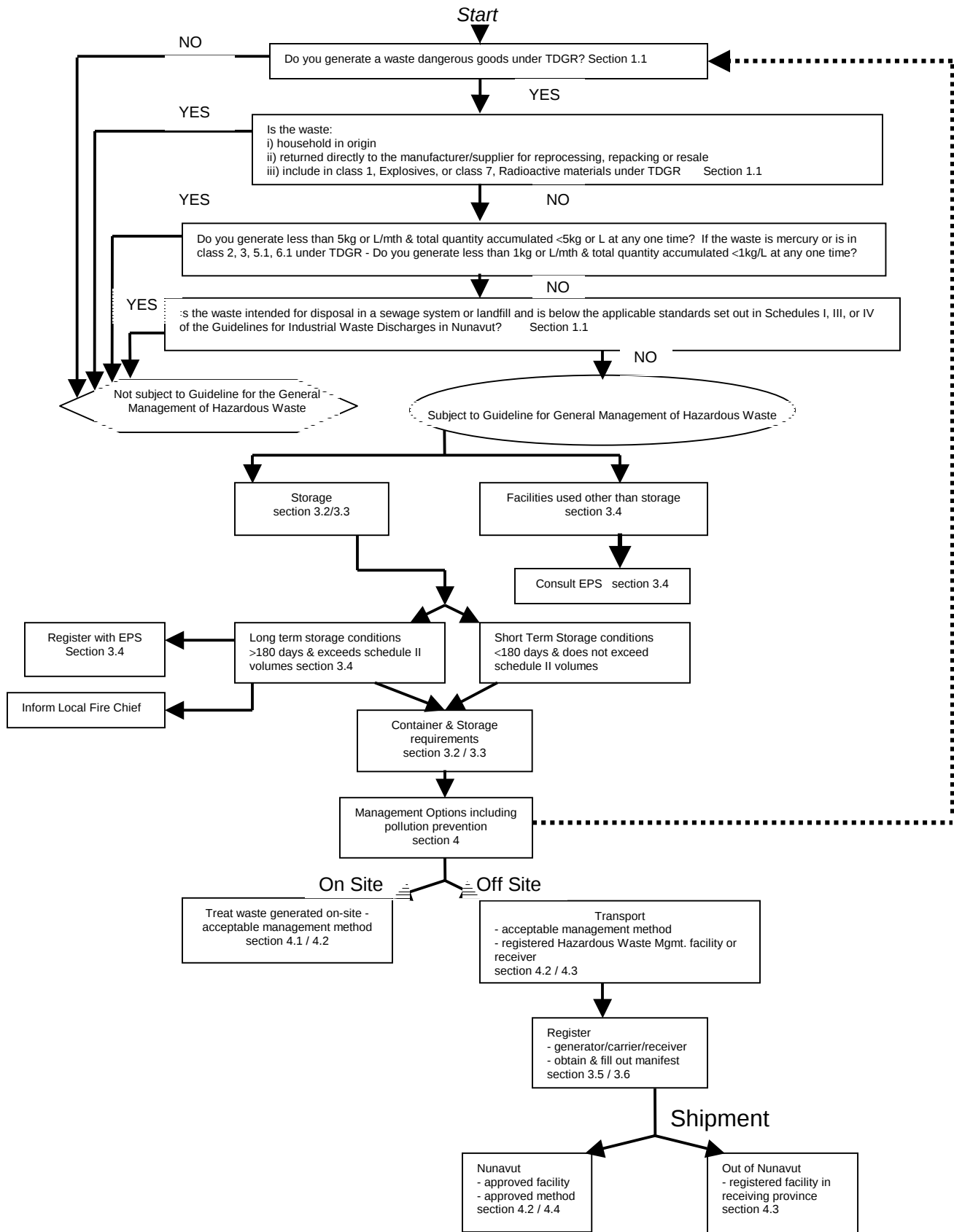


Figure 2: Decision Flow Chart for Managing a Hazardous Waste

3.3 General Requirements for Storage Facilities

The storage of hazardous waste is not an acceptable long term waste management solution.

Hazardous waste must be stored in a safe and secure manner. In general, hazardous waste should be stored according to the following:

- Drainage into and from the site is controlled to prevent spills or leaks from leaving the site and to prevent run off from entering the site.
- Incompatible wastes are segregated by chemical compatibility to ensure safety of the public, workers and facility.
- In a secure area with controlled access. Only persons authorized to enter and trained waste handling procedures should have access to the storage site.
- Regular Inspections are performed and recorded. Containers are placed so that each container can be inspected for signs of leaks or deterioration. Leaking or deteriorated containers should be removed and their contents transferred to a sound container.
- Maintain a record of the type and amount of waste in storage.
- Storage sites have emergency response equipment appropriate for the hazardous waste stored on site.
- Where the site is to be used for long term storage and the amount of waste in storage exceeds the quantity requirements set out in Schedule I, the site should be registered in accordance with Section 3.4 of this guideline.
- Storage sites are expected to meet all local bylaw and zoning requirements. It is recommended that the local Fire Chief be advised of the storage facility and its content for emergency planning and response purposes.

3.4 Registering a Hazardous Waste Management Facility

Hazardous waste management facilities may require registration with the Environmental Protection Service.

Storage Facility:

A storage facility can be a building, locker, compound or area used to store hazardous waste. A storage facility should be registered with EPS if:

- the facility is used or is intended for the storage of hazardous waste for a period of 180 days or more, and
- quantities to be stored exceed the quantities set out in Schedule I for individual waste classes or if the aggregate quantity for all classes of waste stored exceed 5000 Kg/L.

When registering a storage facility the following information should be provided:

- Company name, address, phone number and contact person, including position.
- Location and description of the facility.
- Expected types, quantities and method of storage of the hazardous waste.
- Approvals required to operate and occupy the land for that purpose.

This information should also be provided to the local Fire Chief for emergency planning and response purposes.

Management Facility other than Storage:

Hazardous waste management facilities, other than a storage facility, which manage hazardous waste for commercial purposes require registration with EPS prior to operation. These include facilities which treat, reprocess, consolidate, destroy or recycle hazardous waste. When registering a facility the following information should be provided:

- Company name, address, phone number and contact person, including position.
- Location and description of the facility.
- A description of the waste management activities to be conducted.
- Expected types, quantities and method of storage of the hazardous waste.
- Approvals required to operate and occupy the land for that purpose.

The information requirements for an environmental review of a hazardous waste management facility may be found in the Environmental Information Guide For Industrial Projects on Commissioners Lands. The Guide provides the information requirements for relevant GN agencies to review the environmental impacts of a project. A proponent should review the Guide and contact EPS before making a submission.

3.5 Registering Hazardous Waste Generators, Carriers and Receivers

If hazardous waste is to be transported off site, the generator, carrier and receiver must be registered with EPS. Once registered, an identification number will be assigned which is required to complete the waste manifest under TDGR. A carrier or receiver may either be registered in Nunavut or in the province or territory in which the company is based.

The following information should be provided when applying for a registration number:

Generator:

- Company name, address, phone number and contact person, including position.
- Location and description of the activity taking place which results in the generation of the hazardous waste.
- Expected type, quantity and method of storage of hazardous waste.

Carrier:

- Company name, address, phone number and contact person, including position.
- Proof of transport liability insurance.
- Operating authority for transport in Nunavut.
- Confirmation that the company meets the training requirements of the transport authority.

Receiver:

- Company name, address, phone number and contact person, including position.
- Location and description of the management facilities and activities for hazardous waste.
- Expected type, quantity and method of storage of hazardous waste.

3.6 Waste Manifest Requirements

The *Transportation of Dangerous Goods Regulations* require that a completed hazardous waste manifest form accompany shipments of hazardous waste. Manifests are available from EPS.

The completed manifest form provides:

- Detailed information on the types and amounts of hazardous waste shipped;
- A record of the firms or individuals involved in the shipment; and
- Information on the storage, treatment or disposal of the waste and confirmation that they reached their intended final destination.

The Generator (Consignor), Carrier and Receiver (Consignee) must each complete their portion of the manifest. The information provided on the manifest as well as other TDGR requirements (i.e.: labeling and placarding) are also intended to assist first responders (police, ambulance, fire fighters) with hazard information should a transportation accident occur.

Waste manifest completion instructions are provided on the reverse side of each manifest. Further assistance in completing a waste manifest may be obtained by referring to the User's Guide for the Hazardous Waste Manifest produced by Environment Canada or by contacting the Department of Community Government and Transportation-Motor Vehicles Division.

4 Waste Management

Waste management is intended to reduce or eliminate the effects of waste on the environment, to provide for public and worker safety and to maximize the efficient use of resources. Once hazardous waste has been created the proper treatment and disposal can be expensive. While it is the responsibility of the waste generator to pay for all disposal costs, various waste management options are available to reduce the cost and volume of waste requiring treatment. A more effective and proactive management practice is to eliminate or reduce the generation of the waste. This is referred to as pollution prevention.

Minimizing or avoiding the creation of pollutants and waste can be more effective in protecting the environment than treating them, or cleaning them up after they have been created.

Canadian Council of Ministers of the Environment

4.1 Pollution Prevention

Pollution prevention methods are designed to eliminate the creation of waste. Whereas pollution control options treat waste after it has been created, pollution prevention measures avoid the creation of waste.

Waste generators in Nunavut can reduce costs and prevent pollution by implementing reduction, reuse and recycling programs through changes in operational procedures, maintenance practices and raw material usage. An overall waste management plan should incorporate these ideas.

1. Reduce

The aim of reduction is to eliminate the production of a hazardous waste by using raw materials more efficiently. Methods of reduction include substitution or reduction of a raw material, production redesign, process changes, and improved maintenance activities. Methods which are technically and economically practical in any given situation should be used to reduce or eliminate waste streams.

2. Reuse and Recycle

Reusing or recycling hazardous waste in operating processes within the generating facility is another means of pollution prevention. Alternatively other users may be found to reuse the material that would otherwise require treatment or disposal. The Department of Sustainable Development encourages the reuse and recycling of hazardous waste in the following ways:

- (a) Waste exchanges and associations offer some opportunity for the reuse or recycle of waste. Waste exchanges put potential users of waste materials in contact with waste generators. Appendix B lists a number of waste material exchanges and management associations.
- (b) Recycle programs are in place for some hazardous wastes such as waste oil, waste fuels and solvents. For information on recycling programs, contact the waste management associations in Appendix B or EPS.

4.2 Treatment or Disposal

It is not acceptable for hazardous waste to be abandoned, poured down sewers, dumped on land or discarded at a landfill.

Treating hazardous waste to reduce or eliminate their hazard is the final option after implementing appropriate pollution prevention options. It is the responsibility of the generator to treat or dispose of their hazardous waste properly. Although a discussion of treatment and disposal methods is beyond the scope of this guideline, the following are general points for consideration:

- The generator is required to determine and follow the proper management method for their waste. Sources of assistance include:

- the manufacturer's Material Safety Data Sheet (MSDS) provided with the raw materials.
 - the manufacturer.
 - complying with this guideline and other relevant legislation.
 - waste management consultants and associations.
- **Open burning of hazardous waste is not acceptable.**
 - Treated hazardous waste may be directed for landfilling or to a municipal sewage system providing that the standards outlined in the Guideline for Industrial Waste Discharges in Nunavut are met. The municipal authority and the facility's water licence should also be consulted.
 - Different types of hazardous wastes should not be mixed together in the same container. It is important to control the quality of any waste to ensure it can be recycled or disposed of properly. Contaminating wastes with other wastes may prevent reuse/recycling options and increase disposal costs.
 - Hazardous waste containers must be properly managed. Containers should be emptied, to the greatest extent possible, using regular handling procedures, or by triple rinsing with an appropriate cleaning agent. They should be rendered unusable by puncturing or crushing prior to disposal. This is especially of concern for containers which could eventually be used for water or food storage. Rinsings must be managed according to their waste characteristics.

4.3 Disposal Outside of Nunavut

Hazardous waste can be sent to a hazardous waste management facility outside of Nunavut if the receiving facility is registered in the receiving province or territory and is approved to manage that waste.

Environment Canada monitors international shipments through the *Export and Import of Hazardous Waste Regulations* (EIHW) of CEPA. The International Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal controls the shipment of hazardous waste across international borders. Contact Environment Canada when considering international shipments.

A list of Canadian waste management facilities is available by contacting the associations representing the waste industries. These associations are listed in Appendix B.

4.4 Alternative Management Methods

EPS will give consideration to proposals for alternate management methods that provide an equivalent level of environmental protection to those identified in this guideline.

5 Conclusion

This guideline presents a brief introduction into the management of hazardous waste. It is intended as a source of basic information about the issues involved in the management of hazardous waste. It does not replace the existing legislation which is referenced in the guideline. Please contact the appropriate agency before proceeding. For more information contact:

1. Environmental Protection Service
Department of Sustainable Development
P.O. Box 1000, Station 1195
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 975-5900; Fax: (867) 975-5990
2. Motor Vehicles Division
Department of Community Government and Transportation, Headquarters
Government of Nunavut
P.O. Box 207
Gjoa Haven, Nunavut, X0E 1J0
Phone (867) 360-4614; Fax (867) 360-4619
3. Prevention Services Division
Workers' Compensation Board
P.O. Box 669
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 979-8500; Fax: (867) 979-8501
(867) 873-7468 (accident report); Fax: (867) 873-0262
1-800-661-0792
4. Office of the Fire Marshal (Nunavut Emergency Services Division)
Department of Community Government and Transportation
P.O. Box 1000, Station 700
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 975-5316; Fax: (867) 979-4221
5. Community Development Division
Department of Community Government and Transportation
P.O. Box 1000
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 975-5339; Fax: (867) 979-5811
6. Department of Health and Social Services
P.O. Box 1000, Station 1000
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 979-5766; Fax: (867) 979-5780
7. Indian and Northern Affairs Canada
P.O. Box 2200
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 975-4500; Fax: (867) 975-4560
8. Environmental Protection Branch
Environment Canada
P.O. Box 1870
Iqaluit, Nunavut, X0A 0H0
Phone: (867) 979-3660; Fax: (867) 975-4645

9. Environment Branch
National Energy Board
444 - 7th Avenue SW
Calgary, AB, T2P 0X8
Phone: (403) 292-4800; Fax: (403) 292-5503
10. Explosives Division, Western Region
Natural Resources Canada
244755 Lake Bonavista Drive
Calgary, AB, T2J 0N3
Phone: (403) 292-4766; Fax: (403) 292-4689
11. Western Regional Office
Canadian Nuclear Safety Commission
850, 220 - 4th Avenue SE
Calgary, AB T2G 4X3
Phone: (403) 292-5181; Fax: (403) 292-8985
Radiation Emergency (24 Hour) (613) 995-0479

Schedule 1: Registration Volumes

Minimum quantity of hazardous waste¹ necessary for registration as a Hazardous Waste Storage Facility.

<u>Waste Classification TDG</u>	<u>Quantity² (Kg or L)</u>
1 Explosives	50 ³
2.1 Compressed Gas (flammable)	500 ⁴
2.2 Compressed Gas (non-corrosive, non-flammable non-toxic)	5000 ⁴
2.3 Compressed Gas (toxic)	200 ⁴
2.4 Compressed Gas (corrosive)	500 ⁴
3.1 Flammable Liquids (flash point <-18°C)	1000
3.2 Flammable Liquids (flash point >-18°C)	2000
3.3 Flammable Liquids (flash point >23°C <61°C)	4000
4.1 Flammable Solids	5000
4.2 Spontaneously Combustible Solids	1000
4.3 Solids which React Violently with Water	500
5.1 Oxidizing Substances	1000
5.2 Organic Peroxides	50
6.1 Poisonous Substances	1000
6.2 Infectious Substances	500 ⁴
7 Radioactive	any amount ³
8 Corrosive Substances	1000
9.1 Miscellaneous	1000
9.2 Environmentally Hazardous	50 ⁵
9.3 Dangerous Waste	5000
Total Aggregate Quantity of Hazardous Waste	5000

¹ This applies to hazardous waste and not dangerous goods.

² Quality refers to liquids when the amount is expressed in liters (L) and solids when expressed in kilograms (kg).

³ Controlled under the authority of the Federal *Explosives Act* or *Atomic Energy Control Act*.

⁴ Total liquid volume capacity of the container.

⁵ PCB Storage is regulated by Environment Canada under the *Canadian Environmental Protection Act*.

6 Bibliography

Government of Alberta, Alberta Environmental Protection - Alberta User Guide for Waste Managers, Edmonton, (1996).

Government of Nunavut, Department of Sustainable Development - Guideline for Industrial Waste Discharge, Iqaluit, (2002).

Government of Nunavut, Department of Sustainable Development - Environmental Information Guide For Industrial Projects, Iqaluit, (2002).

Heinke, G. and Wong, J., Guidelines for the Planning, Design, Operation & Maintenance of Solid Waste Modified Landfill Sites in the NWT, Volume 1 & 2. Department of Municipal and Community Affairs, Yellowknife, (1990).

NWT Water Board, Northwest Territories Waters Act, Canadian Gazette Part II, Vol.127, No.13, (1993).

Appendix A: Dangerous Goods Classifications

Class 1: Explosives¹



Class 2: Compressed Gases

Division 2.1: Flammable Gases

Division 2.2: Non-Flammable Gases

Division 2.3: Poison Gases

Division 2.4: Corrosive Gases



Class 3: Flammable Liquids

Division 3.1: Flash Point $< -18^{\circ}\text{C}$

Division 3.2: Flash Point $> -18^{\circ}\text{C}$ and $< 23^{\circ}\text{C}$

Division 3.3: Flash Point $> 23^{\circ}\text{C}$ and $< 61^{\circ}\text{C}$



¹ Class 1 and 7 are regulated under federal legislation and not subject to this guideline.

Class 4: Flammable Solids, Substances Liable To Spontaneous Combustion, Dangerous When Wet

Division 4.1: Flammable Solids

Division 4.2: Spontaneously Combustible

Division 4.3: Dangerous When Wet



Class 5: Oxidizers, Organic Peroxides

Division 5.1: Oxidizers

Division 5.2: Organic Peroxides



Class 6: Poisonous, Infectious Substances

Division 6.1: Poisonous

Division 6.2: Infectious Substances



Class 7: Radioactive Materials¹



Class 8: Corrosives



Class 9: Miscellaneous Dangerous Goods

Division 9.1: Miscellaneous Dangerous Goods

Division 9.2: Hazardous to the Environment

Division 9.3: Dangerous Wastes



Appendix B: Waste Exchanges and Associations

Exchanges

Alberta Action on Waste	1-800-463-6326 (780) 427-6982
British Columbia Waste Exchange	(604) 732-9253
Canadian Chemical Exchange	(450) 436-2525 1-800-561-6511
Ontario Waste Exchange	(416) 778-4199
Quebec Waste Materials Exchange	(418) 643-0394
Saskatchewan Waste Materials Exchange	(306) 931-3242

Associations

Assn. Quebecoise des Techniques de L'eau	(514) 874-3700 Fax
Canadian Chemical Producers Association - Chemical Referral Centre	(613) 237-6215
Canadian Water & Wastewater Association	(613) 747-0524
Environmental Services Association of Alberta	1-800-661-9278 (780) 429-6363
Northern Territories Water and Waste Association	(867) 920-8081
Ontario Waste Management Association	(905) 791-9500
Water Environment Association of Ontario	(905) 726-1300 1-888-355-1300
Western Canada Water & Wastewater Association	1-877-283-2003

If you would like to be placed on a mailing list to receive guideline amendments or for public consultation on Environmental Protection Service legislation please fill this out and mail or fax to:

Environmental Protection Service
Department of Sustainable Development
P.O. Box 1000, Station 1195
Iqaluit, Nunavut, X0A 0H0
Fax: (867) 979-5990

Users of this guide are encouraged to report any errors, misspellings, etc. contained within, to EPS at the above address.

Mailing List for Environmental Protection Service Information

Name: _____

Title: _____

Address : _____

Phone / Fax Number: _____