Spill Contingency Plan

Metamorphic geology and tectonics research on Cumberland Peninsula, Baffin Island

February 5, 2011

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December 2010

1. Introduction

The Metamorphic Geology and Tectonics Research on Cumberland Peninsula, Baffin Island project ("the project") is a five-year research project on the bedrock geology of Cumberland Peninsula as a part of Brett Hamilton's PhD research at the University of Calgary. From June 28th to August 11nd, 2011, Hamilton will be conducting his third summer field research season, and it is this field work to which this spill contingency plan pertains.

2. Location

The project will be conducted from temporary, low-impact tent camps on Cumberland Peninsula approximately 130 km east of Pangnirtung and 170km south southeast of Qikiqtarjuaq. Campsites localities have been selected from topographic maps and high-resolution satellite imagery, but are subject to change. Campsites will be selected from a helicopter immediately before personnel and supplies are dropped off.

Proposed camp locations:

1. Latitude: 66°02'24" N	Longitude: 63°19'31" W	NTS map sheet: 16L03 (1:50 000)
2. Latitude: 66°00'36" N	Longitude: 62°48'08" W	NTS map sheet: 16L02 (1:50 000)
3. Latitude: 66°01'48" N	Longitude: 63°05'37" W	NTS map sheet: 16L03 (1:50 000)
4. Latitude: 66°27'15" N	Longitude: 62°17'08" W	NTS map sheet: 16L08 (1:50 000)

3. Description of Undertaking

Research will consist of bedrock geological mapping, which is performed by two geologists on foot. Mapping principally consists of making observations about the rocks. About 250 rock samples, 1 to 2 kg each, will be knocked off larger formations with a hammer for laboratory analysis.

Supporting this effort will be four temporary two-person tent-based campsites. Each camp will be used for between 8 and 15 days. Camp supplies, personnel, and garbage will be transported to and from Pangnirtung, and between campsites, with a helicopter. The helicopter will return to Pangnirtung and will not stay at the camps. All staging will be in Pangnirtung and I will employ a Pangnirtung resident to assist with logistics.

Camps will consist of two 8'x9' nylon tents and one 8'x10' canvas kitchen tent with no floor. The kitchen tent will include a 2-burner naphtha-fired stove and a naphtha-fired lantern. A gasoline-powered electrical generator will be used to recharge batteries.

An inflatable Zodiac boat with a 10 HP outboard motor will be used for transportation along Clephane Bay during one of the camps.

Campsites will be selected within 50 m of a water body and up to 20 L of water per day will be extracted manually from these water bodies and stored in plastic pails. During the 45-day field season less than 1 m^3 should be used. Grey water will be disposed in pits dug at least 30 m from any water body and will be filled before the campsite is vacated. Similarly, pits for sewage disposal will be dug at least 30m from water bodies and downstream/downslope from the potable water source.

Up to 80 L of gasoline will be stored at the camp in 5 gal/19 L plastic jerrycans to power the Zodiac and electrical generators. The gasoline will be stored in a single fuel cache with a spill kit.

4. Petroleum Storage, Inventory & Transfer

Gasoline will be stored in 5 gal/20 L plastic jerrycans. It will be transferred to generators and an outboard motor fuel tank using the jerrycan spout and a plastic funnel. Smoking, sparks, or open flames are prohibited in the fuel storage and fuelling areas at all times. Fuelling will be done in a designated area equipped with a spill kit.

Naphtha will be stored in the 4 L metal containers in which it is purchased. It will be transferred to camp stoves and lanterns through a plastic funnel.

5. Risk Assessment and Mitigation of Risk

5.1 Petroleum Products and Other Fuels

1) **Gasoline fuel containers**: Leaks or ruptures could affect plastic jerrycans holding gasoline.
2) **Naphtha fuel containers**: Leaks or ruptures could affect metal containers holding naphtha.

Daily inspection and regular maintenance in accordance with recognized and accepted standard practices at the camp fuel cache will reduce any risks identified above.

Spill response training will be provided to all personnel in camp. The training will include a presentation, mock spill, review of spill kit contents and their use, and reporting.

One spill kit will be positioned next to the fuel cache. A description of the contents and configuration of the fuel spill kits is provided in section 8.

6. Responding to Failures and Spills

6.1 Spill Response Contact List

24-hour Spill Line
867-920-8130

Indian and Northern Affairs Canada (INAC) Water Resources Inspector
Iqaluit, NU
867-975-4295

Environment Canada
Iqaluit, NU
867-975-4644
24-hour pager: 867-766-3737

Government of Nunavut, Department of Environment (GN-DoE)
(867) 975-7700
Manager of Pollution Control and Air Quality
867-975-7748

Qikiqtani Inuit Association
Salamonie Shoo
Lands and Resources
P.O. Box 1340
Iqaluit, NU X0A 0H0
Tel: 867-975-8422
Fax: 867-979-1643

University of Calgary
Brenda Mottle, Geoscience Technical Manager

403-220-4852

University of Calgary
David Pattison, Professor, Project Supervisor
403-220-3263

6.2 Basic Steps – Spill Procedure

In the case of any spill or other environmental emergency, it is necessary to react in the most immediate, safe, and environmentally responsible manner. No spill or incident is so minor that it can be ignored and every spill must be reported.

The basic steps of the spill response plan are as follows:

1. *Ensure* the safety of all persons at all times.
2. *Identify* and find the spill substance and its source, and if possible, stop the process or shut off the source.
3. *Inform* the on-site coordinator or his/her designate at once, so that he/she may take the appropriate actions. Appropriate action includes the notification of the spill to the 24-hour Spill Line and INAC Water Resource Officer. A copy of the Spill Report can be found in Appendix I.
4. *Contain* the spill or environmental hazard, as per its nature, and as per the advice of the Spill Line and the INAC Water Resource Officer as required.
5. *Implement* any necessary clean-up and/or remedial action.

6.3 Basic Steps – Chain of Command

1. *Immediately* notify and report to the 24-hour Spill Line at 867-920-8130, and the Water Resource Officer at 867-975-4295, Environment Canada personnel at 867-766-3737, and Qikiqtani Inuit Association Land Inspector at 867-975-8422

2. *A Spill Report Form (Appendix II)* is filled out as completely as possible before or after contacting the 24-hour Spill Line.

3. Notify Brenda Mottle, University of Calgary Geoscience Technical Manager at 403-220-4852 And David Pattison, Project Supervisor at 403-220-3263.

6.4 Other contacts for spill response/assistance and further reporting

Nunavut Water Board 867-360-6338

Fisheries and Oceans Canada, Habitat Impact Biologist 867-979-8007

Government of Nunavut Department of Environment 867-975-5910

Qikiqtani Inuit Association, Land Use Inspector 867-975-8422

Cumberland Project 24-hour on-site contact:
Brett Hamilton
Mobile Satellite Telephone with voice mail # to be determined

7. Taking Action

7.1 Spill Response Actions for Gasoline and Naphtha

Take action only if safety permits. Stop the source flow if safe to do so and eliminate all ignition sources. ***Never smoke*** *when dealing with these types of spills.*

On Land

- Build a containment berm using soil material or snow and place a plastic tarp at the foot of the berm for easy capture of the spill after all vapours have dissipated.
- Remove the spill by using absorbent pads or excavating the soil, gravel or snow.
- Remove spill splashed on vegetation using particulate absorbent material.

- Contact regulatory agencies for approval before commencing with the removal of any soil, gravel or vegetation.

On Muskeg
- Do not deploy personnel and equipment on marsh and vegetation.
- Remove pooled gasoline or naphtha with sorbent pads and/or skimmer.
- Flush with low-pressure water to herd oil to collection point.
- On advice from regulatory agencies, burn only in localized areas e.g., trenches, piles or windrows.
- Do not burn if root systems can be damages (low water table).
- Minimize damage caused by equipment and excavation.

On Water
- Contain spill as close to release point as possible.
- Use containment boom to capture spill for recovery after vapours have dissipated.
- Use absorbent pads to capture smaller spills.
- Use skimmer for larger spills.

On Snow and Ice
- Build a containment berm around spill using snow.
- Remove the spill using absorbent pads or particulate sorbent material.
- The contaminated ice and snow must be scraped and shovelled into plastic buckets with lids or polypropylene bags.

Storage and Transfer
All contaminated water, ice, snow, soil, and clean-up supplies will be stored in closed, labelled containers. All containers will be stored in a well-ventilated area away from incompatible materials.

Disposal
Any contaminated material will be shipped from the site to an appropriate and approved facility. The DoE monitors the movement of hazardous wastes from generators, carriers to receivers, through a tracking document (Waste Manifest). A waste manifest will accompany all movements.

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8. Spill Equipment

Spill kits will be on site at all designated refuelling stations. Spill kits consist of:
- heavy PVC tarp, impermeable to gasoline spills, sized in accordance with fuel containers (4x4' for jerrycans of gasoline at generator stations
- aluminum stakes to secure impermeable tarp to ground
- particulate absorbent
- petroleum sorbent pads
- 2 pairs of PVC gloves
- 2 pairs of safety goggles
- disposable bags
- 1 shovel
- 1 fire extinguisher per spill site

9. Permits and Licences

The applicant has applied for all necessary Land Use and scientific research permits and licences. These include:

Nunavut Research Institute	Licence #: pending	applied: February 5, 2011
Nunavut Impact Review Board	Report #: pending	applied: February 5, 2011

Qikiqtani Inuit Association	Landuse Permit #: pending	applied: pending
Nunavut Water Board	Licence: pending	applied: February 5, 2011

10. Contacts

Project Proponent:

Brett Hamilton
PhD Student
Geoscience
University of Calgary
2500 University Drive NW
Calgary, Alberta T2N 1N4
Cell: 403-463-0890
Office: 403-220-2737
brett.hamilton@ucalgary.ca

Project Supervisor:

David Pattison
Professor
Department of Geoscience
University of Calgary
2500 University Drive NW
Calgary, Alberta T2N 1N4
Tel: 403-220-3263
Fax: 403-284-0074
pattison@ucalgary.ca

Appendix I Maps of project location

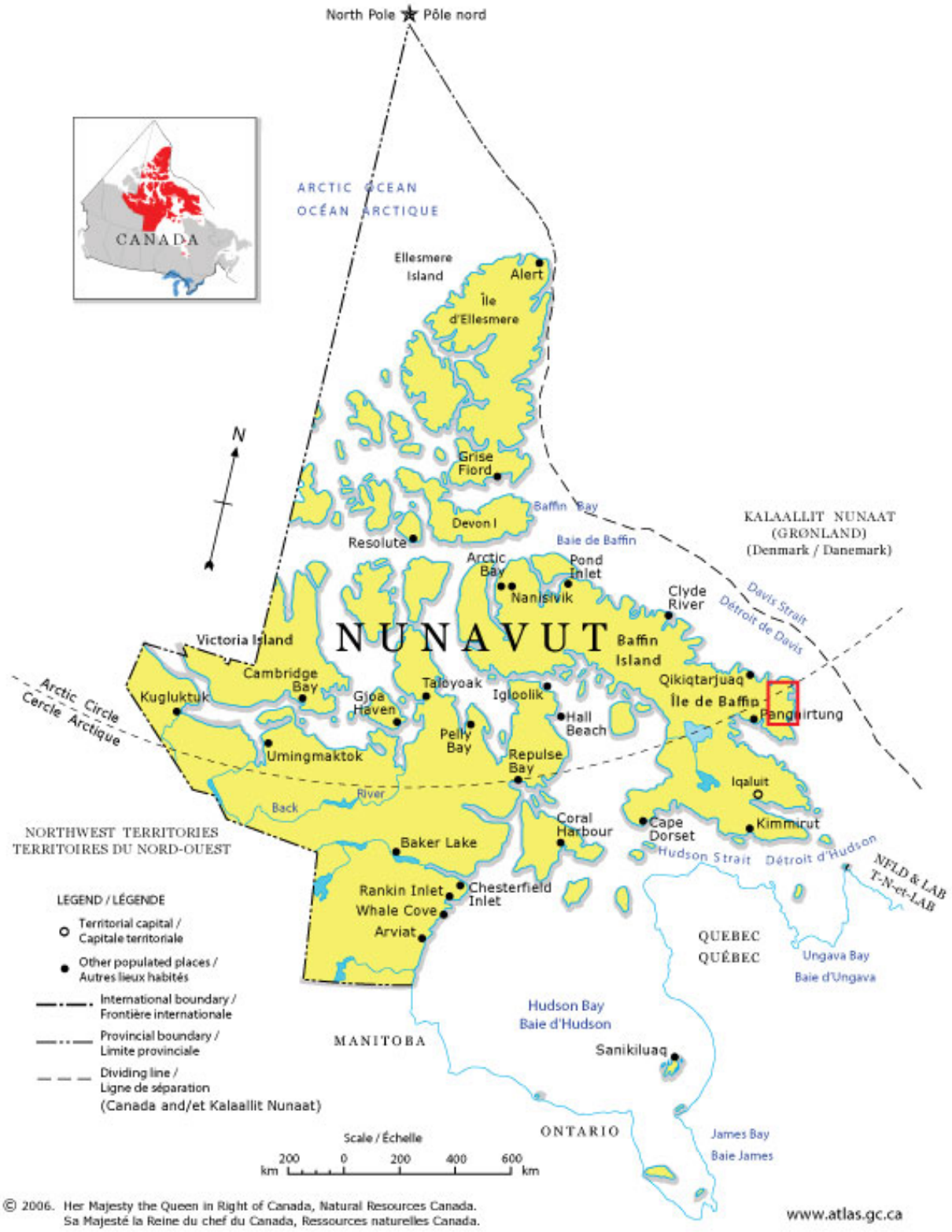

Figure 1: Map of Nunavut. The red box shows the location of the map in Figure 2.

Metamorphic geology and tectonics of Cumberland Peninsula, Baffin Island, Nunavut
Land use for 2011 field season: Mapping areas and temporary campsites

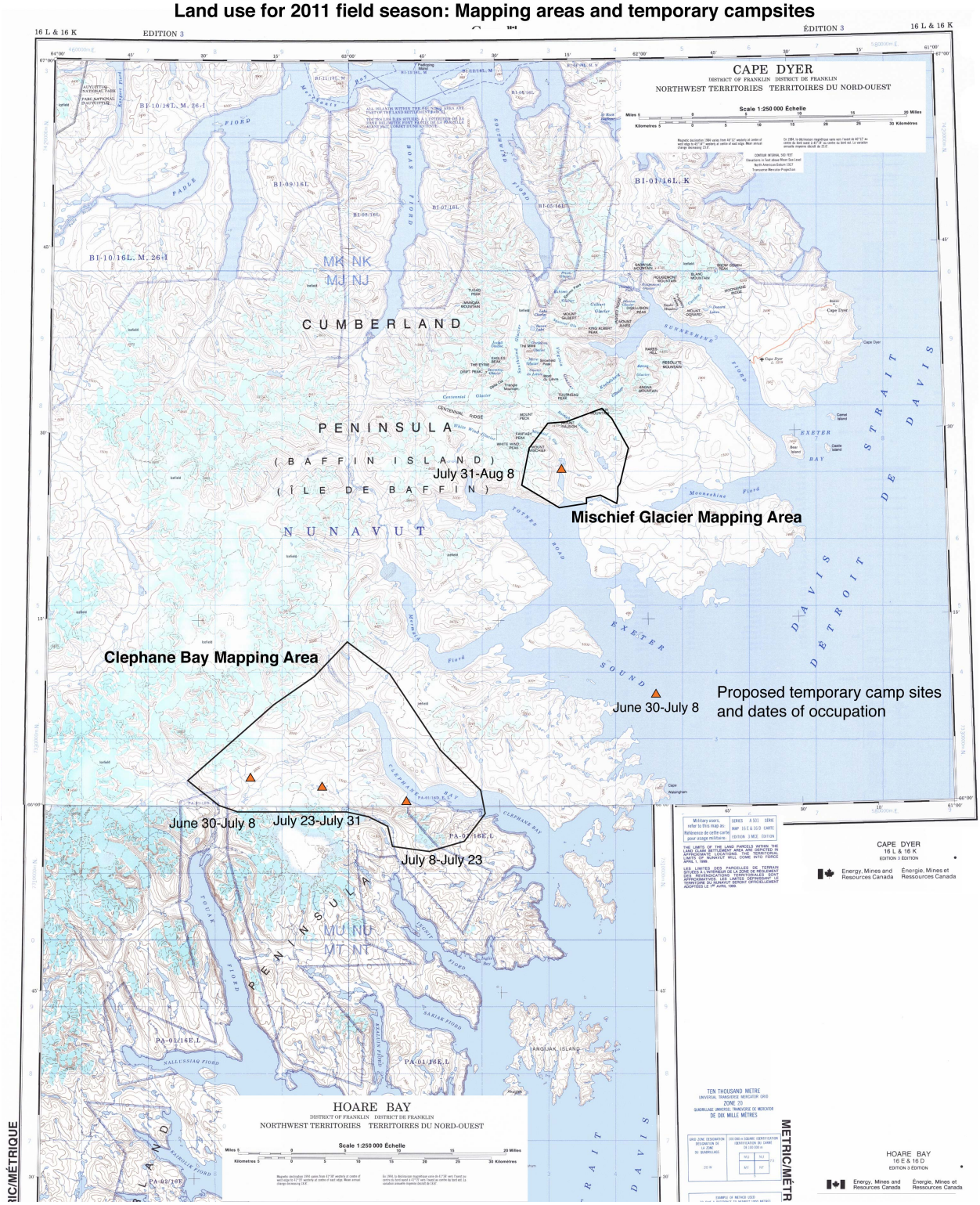

Figure 2: Map of the proposed research area and campsites.

Appendix II Spill Report

Northwest Territories | Nunavut | Canada

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	REPORT NUMBER
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	____-____
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	
	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 ENVIRONMENT	
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 ☐ CCG ☐ 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			

PAGE 1 OF _____

Appendix III Material Safety Data Sheets

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A Valero Company

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS NUMBER: 5100

MSDS DATE: April 1, 2004

PRODUCT NAME: UNLEADED GASOLINE

TRANSPORTATION EMERGENCIES: **CALL CANUTEC AT (613) 996-6666**

Ontario Regional Poison Information Center
1-800-267-1373 (Ottawa)
1-800-268-9017 (Toronto)

Nova Scotia / PEI Poison Control Center:
1-800-565-8161

Quebec Poison Control Center
1-800-463-5060
New Brunswick Poison Information Center
(506) 857-5555
Newfoundland Poison Control Center
(709) 722-1110

MSDS ASSISTANCE: **(888) 871-4404**

SUPPLIER'S NAME/ADDRESS:

ULTRAMAR LTD
2200 McGill College
Montreal, Quebec H3A 3L3
(514) 499-6111

CHEMICAL NAME: Gasoline **CAS NUMBER:** 8006-61-9

SYNONYMS/COMMON NAMES: This Material Safety Data Sheet applies to the following product descriptions for Hazard Communication purposes only. Technical specifications vary greatly depending on the product and are not reflected in this document. Consult specification sheets for technical information.

Unleaded Regular (No-lead) Gasoline - all octanes, vapor pressures, and oxygenate blends
Unleaded Plus (Mid-grade) Gasoline - all octanes, vapor pressures, and oxygenate blends
Unleaded Supreme (Super) Gasoline - all octanes, vapor pressures, and oxygenate blends

2. COMPOSITION, INFORMATION ON INGREDIENTS

DESCRIPTION: Gasoline is a complex mixture of hydrocarbons from a variety of chemical processes blended to meet standardized product specifications. Composition varies greatly and includes C4 to C11 hydrocarbons with a boiling range of about 38-225° C. The following is a non-exhaustive list of common components, typical maximum percentage, and exposure limits for each.

Component or Material Name	%	CAS Number	ACGIH Limits			OSHA Exposure Limits			
			TLV	STEL	Units	PEL	STEL	C/P	Units
Gasoline	100	8006-61-9	300	500	ppm	N/A	N/A	N/A	N/A
Butane	<15	106-97-8	800	N/A	ppm	N/A	N/A	N/A	N/A
Pentane (all isomers)	<16	109-66-0	600	N/A	ppm	1000	N/A	N/A	ppm
n-Hexane	<3	110-54-3	50	N/A	ppm	500	N/A	N/A	ppm
Hexane, other isomers	<9	N/A	500	1000	ppm	N/A	N/A	N/A	N/A
Benzene	1-2	71-43-2	0.5	2.5	ppm	1.0	5.0	N/A	ppm
Toluene	<10	108-88-3	50	N/A	ppm	200	N/A	C-300 P-500	ppm
n-Heptane	<2	142-82-5	400	500	ppm	500	N/A	N/A	ppm
Ethylbenzene	<2	100-41-4	100	125	ppm	100	N/A	N/A	ppm
Xylene, (o, m & p isomers)	<10	1330-20-7	100	150	ppm	100	N/A	N/A	ppm
Cyclohexane	<2	110-82-7	100	N/A	ppm	300	N/A	N/A	ppm
Trimethyl benzene (mixed isomers)	<8	25551-13-7	25	N/A	ppm	N/A	N/A	N/A	N/A

C = Ceiling concentration not to be exceeded at any time. P = Peak concentration for a single 10 minute exposure per day.

Basis for LD_{50} and LC50 values	LD_{50} value	Species & route	LC_{50} Value	Species and route
Mixture	18.7 ml/kg	Rat by oral route	300 g/m3/ 5m	Rat by inhalation

3. HAZARDS IDENTIFICATION

HEALTH HAZARD DATA:

1. The major effect of exposure to this product is central nervous system depression and polyneuropathy.
2. N-heptane and cyclohexane cause narcosis and irritation of eyes and mucous membranes. Cyclohexane has been reported to cause liver and kidney changes in rabbits. N-heptane has been reported to cause polyneuritis following prolonged exposure.
3. Trimethylbenzene (pseudocumene (1,2,4) & mesitylene (1,2,5)) has a PEL and TLV of 25 ppm 8 hr. TWA; the isomers may cause nervousness, tension, and anxiety and asthmatic bronchitis.
4. n-Hexane has been shown to cause polyneuropathy (peripheral nerve damage) after repeated and prolonged exposure, other hexanes show narcotic effects at 1000 ppm and are not metabolized like n-hexane.
5. Toluene can cause impairment of coordination and momentary loss of memory (200-500 ppm); Palpitations, extreme weakness and pronounced loss of coordination (500-1500). The 100 ppm 8 hr. TWA and the 150-ppm STEL provide adequate protection.

Hazards of Combustion Products: Carbon monoxide and carbon dioxide can be found in engine exhaust and other forms of hydrocarbon combustion. Carbon monoxide in moderate concentrations can cause symptoms of headache, nausea, vomiting, increased cardiac output, and mental confusion. Exposure to higher concentrations of carbon monoxide can cause loss of consciousness, heart damage, brain damage, and/or death. Exposure to high concentrations of carbon dioxide can cause simple asphyxiation by displacing oxygen. Combustion of this and other similar materials should only be carried out in well-ventilated areas.

MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: Medical conditions which have the same symptoms and effects as those outlined under the health hazard information section can be aggravated by exposure to this product.
MEDICAL LIMITATION: N/A

ROUTES OF EXPOSURE

INHALATION: Irritation of the upper respiratory tract with central nervous system stimulation possibly followed by depression, dizziness, headache, discoordination, anesthesia, coma and respiratory arrest. The threshold for immediate mild toxic effects is reported to be 900-1000 ppm.
SKIN CONTACT: Defatting may occur with continued or prolonged contact. Irritation and burning sensation may

occur on exposure to liquid or high vapor phase exposure.
SKIN ABSORPTION: Benzene is absorbed directly through intact skin.
EYE CONTACT: Contact with liquid will cause severe burning sensation with temporary irritation and swelling of lids. Vapors in concentrations of 160-270 ppm in air will irritate the eye.
INGESTION: Irritation of mucous membranes of the throat, esophagus and stomach and may result in nausea and vomiting; depression may occur if absorbed (see Inhalation above). If aspirated, chemical pneumonitis may occur with potentially fatal results.

CARCINOGENICITY INFORMATION

Gasoline mixtures are not listed as carcinogenic by NTP, OSHA, and ACGIH. Gasoline mixtures are listed as a possible carcinogen by IARC (2B) and NIOSH. Benzene is listed as a confirmed human carcinogen by IARC, NTP, OSHA, NIOSH, and ACGIH.

MUTAGENICITY/TERATOGENICITY/ REPRODUCTIVE TOXICITY INFORMATION

Mutagenicity: No information available.
Teratogenicity: No teratogenic effect was observed among the offspring of rats exposed to 400-1600 ppm of gasoline by inhalation for six hours daily during pregnancy.
Reproductive Toxicity: No information available.

4. FIRST AID MEASURES

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire eye surface. **SEEK MEDICAL ATTENTION IMMEDIATELY**.
SKIN: Wash contaminated areas with plenty of soap and water. A soothing ointment may be applied to irritated skin after thorough cleansing. Remove contaminated clothing and footwear. SEEK MEDICAL ATTENTION if symptoms result.
INHALATION: Get person out of contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. **SEEK MEDICAL ATTENTION IMMEDIATELY.**
INGESTION: Never give anything by mouth to an unconscious person. If swallowed, DO NOT induce vomiting. If vomiting occurs spontaneously, keep airway clear. **SEEK MEDICAL ATTENTION IMMEDIATELY.**

NOTES TO PHYSICIAN: Gastric lavage only if large quantity has been ingested. Guard against aspiration into lungs, which may result in chemical pneumonitis. Irregular heartbeat may occur; use of Adrenaline is not advisable. Treat symptomatically.

5. FIRE AND EXPLOSION DATA

FLASH POINT: <-40°F (Estimated) **AUTOIGNITION TEMPERATURE:** 400°F (Estimated)
FLAMMABLE LIMITS IN AIR: UEL: 7.6%
LEL: 1.3%
EXTINGUISHING MEDIA: Use dry chemical, carbon dioxide, foam, or water spray. Water may be ineffective in fighting fires of liquids with low flash points, but water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak.
SPECIAL FIRE FIGHTING PROCEDURES: Pressure-demand, self-contained breathing apparatus should be provided for fire fighters engaged in activities in the hot zone.
UNUSUAL FIRE AND EXPLOSION HAZARD: Vapors may travel extended distances from the source and flashback with explosive force if ignition sources are present. Vapors may accumulate in low-lying areas.
SENSITIVITY TO STATIC DISCHARGE /MECHANICAL IMPACT: May accumulate static charge when transferred or mixed. Bond and ground transfer lines and containers. Not impact sensitive.

6. ACCIDENTAL RELEASE MEASURES

Eliminate all sources of ignition (flames, sparks, heat, electrical equipment, and engines) and remove non-response personnel from the spill area. Contain liquids with earthen dikes or petroleum absorbent materials. Prevent discharges to streams or sewer systems. Control vapors from large spills with fire-fighting foam. Remove liquid with explosion-proof equipment and grounded and bonded suction hoses. Report spills or releases as

required to the appropriate local, state, and federal regulatory agencies.

7. HANDLING AND STORAGE INFORMATION

This product is intended for use as engine fuel only. Protect containers against physical damage. Outside, detached, or underground storage is preferred. Separate from oxidizing materials. Store in cool, well ventilated areas of non-combustible construction away from possible sources of ignition (flames, sparks, heat, electrical equipment, and engines). Transfer with explosion-proof equipment and grounded and bonded transfer lines. Consult NFPA 30 and for specific requirements.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION REQUIREMENTS: Work in well-ventilated areas. Use engineering controls to transfer and store material. Explosion-proof equipment is required. Vapor recovery systems may be required in some areas. Mechanical ventilation is required for confined spaces such as tanks and vessels.

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY: Respiratory protection is normally not required when transferring material in well-ventilated areas. When transferring in enclosed areas or at high temperatures, vapors concentrations may warrant use of respiratory equipment. Use NIOSH/MSHA approved respirators following manufacturer's recommendations. Positive pressure supplied air respiratory protection is required for IDLH areas; follow ANSI Z88.2 or CSA Z94.4-93.
EYE: Face shield and goggles or chemical goggles should be worn where splashing is likely.
GLOVES: Impervious gloves such, as nitrile gloves should be worn during routine handling of this product.
OTHER CLOTHING AND EQUIPMENT: Standard work clothing is sufficient with good practices. Shoes contaminated with this product that can not be decontaminated should be discarded. Clothing contaminated with this product should be removed, washed in soap and water, and dried before reuse. Contaminated clothing should be spread out to dry in a well-ventilated area. Shower and eyewash facilities should be accessible.

SPECIAL WORK PRACTICES:
(1) Wear impervious gloves such as nitrile gloves when "dip-sticking storage tanks"
(2) Work up-wind of small spills during clean-up
(3) DO NOT USE THIS PRODUCT as a solvent for cleaning equipment or skin
(4) Store small quantities ONLY in "SAFETY CANS" approved for gasoline storage and labeled “Gasoline”
(5) Allow contaminated rags to completely dry in a well-ventilated area before storage.

BIOLOGICAL: No applicable procedure; breath analysis for hydrocarbons has been suggested. Below are biological monitoring procedures for certain ingredients:

ANALYTE	DETERMINANT	SAMPLING TIME	BIOLOGICAL EXPOSURE INDEX (BEI)
Benzene	Phenol in urine (required by OSHA)	End of Shift	75 mg/L
	S-phenylmercapturic acid in urine*	End of shift	25 μg/g creatinine
	t,t-Muconic Acid in urine	End of shift	500 ug/g creatinine
	S-Phenylmercapturic Acid in Urine	End of shift	25 μg/g
Toluene	Hippuric acid in urine	End of shift	1.6 g/g creatinine
	o-Cresol in urine	End of shift	0.5 mg/L
	Toluene in venous blood	Prior to last shift of week	0.05 mg/L
n-Hexane	2,5-Hexanedione in urine	End of shift	5 mg/g creatinine
	n-Hexane in exhaled air		Semiquantitative
Ethylbenzene	Mandelic acid in urine	End of last shift of week	1.5 g/g creatinine
	Ethylbenzene in exhaled air		Semiquantitative
Xylene	Methylhippuric acid in urine	End of shift	1.5 g/g creatinine

*Required by OSHA Benzene Standard after emergency exposures – See 29 CFR 1910.1028(i)(4)

PERSONAL/AREA: Both active and passive air monitoring utilizing activated charcoal absorption followed by gas

chromatography are recommended. A molecular weight of 72.5 has been suggested as the average value to convert total hydrocarbon result from milligrams per cubic meter to ppm. Direct reading indicating tubes are available to evaluate short-term exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear, yellow, green or amber tinted liquid with characteristic gasoline odor.

BOILING RANGE @ 760 mm Hg: 38-225 °C
MELTING POINT: NA
REID VAPOR PRESSURE: 325-525 mmHg
BULK DENSITY: 680-760 kg/M3
SPECIFIC GRAVITY (H_2O=1): 0.68-0.76 @ 16°C
API GRAVITY: 50-75
COEFFICENT OF WATER/OIL DISTRIBUTION: ~0

VAPOR DENSITY (Air=1): 3.0-4.0
EVAPORATION RATE (BuAc=1): >1, Rapid
% VOLATILES BY VOL.: ~100
SOLUBILITY IN H20 % BY WT.: Trace
pH: NA
RON: 89 - 98

10. STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY: Under normal conditions, the material is stable.
INCOMPATIBILITY: Avoid contact with oxidizers and sources of ignition.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: None

11. TOXICOLOGICAL INFORMATION

1. Studies have shown that repeated exposure of laboratory animals to high concentrations of whole gasoline vapors at 67,262 and 2056 PPM has caused kidney damage and cancer of the kidney in rats and liver cancer in mice.
2. IARC has listed gasoline as possibly carcinogenic (2B) to humans with limited evidence in humans in the absence of sufficient evidence in experimental animals. NIOSH lists gasoline as a carcinogen with no further classification.
3. ACGIH lists benzene as a human carcinogen with an assigned TLV of 0.5 PPM 8 hour TWA and a STEL of 2.5 PPM; IARC, NTP & OSHA show sufficient evidence for classifying Benzene as a human carcinogen, see 29 CFR 1910.1028 for current PEL of 1 PPM and specific actions to take. Studies have shown that benzene can induce leukemia at concentrations as low as 1 PPM. Significant elevations of chromosomal aberrations have been corroborated among workers exposed to levels at mean concentrations less than 10 PPM. Based on risk assessment studies by Rinsky, an individual inhaling 1 PPM of benzene for 40 years, the odds of benzene-induced leukemic death were 1.7 times higher than those of unexposed workers.
   For more detailed information, contact MSDS Assistance.

12. ECOLOGICAL INFORMATION

For further information, contact MSDS Assistance.

13. DISPOSAL CONSIDERATIONS

Shipment, storage, disposal, and cleanup actions of waste materials are regulated under local, provincial and federal rules. Contact the appropriate agencies if uncertain of applicability.

14. TRANSPORT INFORMATION

TDG PROPER SHIPPING NAME	Gasoline
TDG HAZARD CLASS	3
PACKING GROUP (PG)	II
TDG I.D. NUMBER	UN1203

15. REGULATORY INFORMATION

WHMIS CLASS:
Class B2: Flammable Liquids
Class D2A: Materials Causing Other Toxic Effects – Carcinogenicity
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. PREPARER & OTHER INFORMATION

MSDS Prepared By:
ULTRAMAR LTD

NFPA (National Fire Protection Association) Hazard Ratings Codes

Health	Fire	Reactivity	Other
1	3	0	

Based on "Standard System for the Identification of the Fire Hazards of Materials, NFPA No. 704 M

This Material Safety Data Sheet was prepared by Ultramar Ltd in accordance with SOR/88-66. All information, recommendations and suggestions appearing herein concerning this product are based upon tests and data believed to be reliable, however, it is the user's responsibility to determine the safety, toxicity and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantee expressed or implied is made by Ultramar Ltd as to the effects of such use, the results to be obtained or the safety and toxicity of the product nor does Ultramar Ltd assume any liability arising out of use by others of the product referred to herein. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or Desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

Definitions of Material Safety Data Sheet Terminology

GOVERNMENT AGENCIES AND PRIVATE ASSOCIATIONS

ACGIH - American Conference of Governmental Industrial Hygienists, (private association)
DOT - United States Department of Transportation
EPA - United States Environmental Protection Agency
IARC - International Agency for Research on Cancer, (private association)
NFPA - National Fire Protection Association, (private association)
MSHA - Mine Safety and Health Administration, U.S. Department of Labor
NIOSH - National Institute of Occupational Safety and Health, U.S. Department of Health and Human Services
NTP - National Toxicology Program, (private association)
OSHA - Occupational Safety and Health Administration, U.S. Department of Labor
WHMIS- Workplace Hazardous Material Information System
CSA- Canadian Standards Association

HAZARD AND EXPOSURE INFORMATION

Acute Hazard - An adverse health effect which occurs rapidly as a result of short term exposure.
CAS # - American Chemical Society's Chemical Abstract service registry number which identifies the product and/or ingredients.
Ceiling - The concentration that should not be exceeded during any part of the working exposure
Chronic Hazard - An adverse health effect which generally occurs as a result of long term exposure or short term exposure with delayed health effects and is of long duration
Fire Hazard - A material that poses a physical hazard by being flammable, combustible, phyrophoric or an oxidizer as defined by 29 CFR 1910.1200
Hazard Class - DOT hazard classification
Hazardous Ingredients - Names of ingredients which have been identified as health hazards
IDLH- Immediately Dangerous to Life and Health, the airborne concentration below which a person can escape without respiratory protection and exposure up to 30 minutes, and not suffer debilitating or irreversible health effects. Established by NIOSH.
mg/m^3 - Milligrams of contaminant per cubic meter of air, a mass to volume ratio
N/A - Not available or no relevant information found **NA** - Not applicable
PEL - OSHA permissible exposure limit; an action level of one half this value may be applicable
ppm - Part per million (one volume of vapor or gas in one million volumes of air)
Pressure Hazard - A material that poses a physical hazard due to the potential of a sudden release of pressure such as explosive or a compressed gas as defined by 29 CFR 1910.1200
Reactive Hazard - A material that poses a physical hazard due to the potential to become unstable reactive, water reactive or that is an organic peroxide as defined by 29 CFR 1910.1200.
STEL - The ACGIH Short-Term Exposure Limit, a 15-minute Time-Weighted Average exposure which should not be exceeded at any time during a workday, even if the 8-hour TWA is less than the TLV.
TLV - ACGIH Threshold Limit Value, represented herein as an 8-hour TWA concentration.
8-hour TWA - The time weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.
~~W~~ - DO NOT ADD WATER - water reactive materials may produce toxic gas, extreme heat, or chemical reaction on contact with water.
LD_{50} – Single dose of a substance that, when administered by a defined route in an animal assay, is expected to the cause the death of 50% of the defined animal population.
LC_{50} - The concentration of a substance in air that, when administered by means of inhalation over a specified length of time in an animal assay, is expected to cause the death of 50% of a defined animal population.

Material Safety Data Sheet

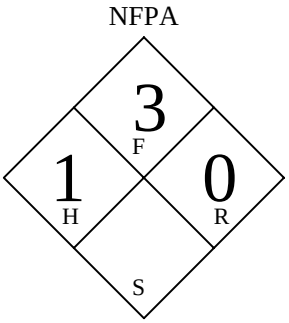
Product: Coleman® Camp Fuel

1. Chemical Product and Company Identification

Trade Name of this Product: Coleman® Camp Fuel

Manufacturer
HOC Industries, Inc.
3511 N. Ohio
Wichita, KS 67219

Contact Name
Don Poschen
Phone Number
(316) 838-4663
Emergency Phone
(800) 633-8253



2. Composition and Information on Ingredients

Ingredient			ACGIH	
Light Hydrotreated Distillate	**CAS Number** 68410-97-9	**Weight %** 100	**TWA** 300 ppm	**STEL** 500 ppm

3. Hazard Identification

******EMERGENCY OVERVIEW******
* WARNING: Flammable Liquid and Vapor. The Flash Point is <0 degrees F.
* This product is a clear, green, light hydrocarbon liquid.
* It has a solvent petroleum odor. The product floats on water.
* When burned the product produces carbon monoxide and other asphyxiants during combustion.
* Harmful if inhaled and may cause delayed lung injury.
* Aspiration hazard if swallowed - can enter lungs and cause damage.
* Keep away from heat, sparks, and flame.

* Avoid breathing vapor. Use ventilation to keep vapor below exposure limits.
* Avoid contact with eyes, skin and clothing. Material splashed into the eyes will irritate tissues. Gently flush material from eyes with clean water.
* Unprotected exposure to this product will cause skin dryness.
* Remove product soaked clothing and wash with mild soap.
* As with any petroleum product, avoid mixing this product with strong oxidizers.
* This product is not listed on the NTP, IARC, OSHA, or ACGIH lists of suspected/confirmed carcinogens.
* This product may be toxic to fish but will be toxic to birds and wildlife through ingestion during pelage cleaning.
* This product is readily biodegradable in the presence of air and sunlight.
* Spilled material is slippery and may cause falls.
*****END OF EMERGENCY OVERVIEW *****

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTE(S) OF ENTRY: Skin.

EYES
Tests on similiar materials suggest acute irritation can be expected.

SKIN
Tests on similiar materials indicate acute irritation is expected to occur upon short-term exposure, chronic dermatitis on prolonged contact.

INGESTION
ACUTE ASPIRATION HAZARD. Tests on similar materials indicate possibility of the following symptoms: headache, nausea, drowsiness, fatigue, pneumonitis, pulmonary adema, central nervous system depression, convulsions, and loss of consciousness.

INHALATION
Tests on similar material indicate the possibility of the following symptoms: headache, nasal and respiratory irritation, nausea, drowsiness, breathlessness, fatigue, central nervous system depression, convulsions, and loss of consciousness.

CHRONIC
Prolonged and/or repeated contact with this material may produce skin irritation and inflammation.
CANCER INFORMATION
Carcinogen listed by:
National Toxicology Program: No
I.A.R.C.: No
OSHA: No
ACGIH: No
This product does not require a cancer hazard warning in accordance with the OSHA Hazard Communication Standard.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Personnel with pre-existing skin disorders should avoid contact with this product.

4. First Aid Information

EYES
Flush eyes immediately with water for at least 15 minutes or until irritation subsides, occasionally lifting lower and upper lids. Get medical attention promptly.

SKIN
Wash thoroughly with soap and water. Immediately remove contaminated clothing and wash before reuse. If irritation or rash develops, obtain medical assistance. Immediately remove soaked clothing.

INGESTION
CALL PHYSICIAN IMMEDIATELY. Do not induce vomiting except at the instruction of a physician. Never give anything by mouth to an unconscious person.

INHALATION
Remove person to fresh air and consult a physician. If breathing is difficult, give oxygen. If not breathing give artificial respiration.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES
FLASH POINT: <0°F (<-18°C) Tag Closed Cup
AUTOIGNITION: not available
FLAMMABILITY CLASS: IB
LOWER EXPLOSIVE LIMIT (%): not available
UPPER EXPLOSIVE LIMIT (%): not available

FIRE AND EXPLOSION HAZARDS
Can form flammable mixtures with air and flash at room temperature or upon slight heat application. Vapors are heavier than air and may travel considerable distance. Explosion hazard in confined spaces if exposed to ignition source. Mists or sprays may be flammable below fuel's normal flash point. Keep away from heat or open flame.

EXTINGUISHING MEDIA
Dry Chemical, carbon dioxide, and foam. NOTE: Water, fog and foam may cause frothing and spattering. Water stream may spread fire.

FIRE FIGHTING INSTRUCTIONS
Use water to cool containers exposed to flames. Do not enter enclosed or a confined work space without proper protective equipment. Fire fighting personnel should wear respiratory protection (positive pressure if available). If leak or spill has not ignited, use water spray to disperse the vapors.

Products of combustion include fumes, smoke and carbon monoxide.

6. Accidental Release Measures

Evacuate area and shut off ignition source. Contain spill and keep from entering waterways or sewers. Use personal protective equipment. Advise EPA or state agency if required. Absorb with inert material. Shovel or sweep spill and place in closed container for disposal.

7. Handling and Storage

HANDLING: Keep product away from high energy ignition sources, heat, sparks, pilot lights,
static electricity, and open flame. Avoid contact with skin. Avoid inhalation of vapors or mists. Use in well ventilated area away from all ignition sources. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Store in a cool area. Store as OSHA Class IB flammable liquid

SPECIAL PRECAUTIONS: To prevent and minimize fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Use the correct grounding procedures. Refer to national, state, or local regulations covering safety at petroleum handling and storage areas for this product.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

WORK/HYGIENIC PRACTICES
Wash hands with soap and water before eating, drinking, smoking or use of toilet facilities. Do not use harsh abrasive skin cleaners for washing exposed skin areas. Take a shower after work if general contact occurs. Remove fuel-soaked clothing and launder before reuse. Launder or discard contaminated shoes and leather gloves.

8. Exposure Controls and Personal Protection

ENGINEERING CONTROLS
Use adequate ventilation to keep fuel mists of this material below applicable standard(s). See Section on occupational exposure limits.

EYE/FACE PROTECTION
Safety glasses, splash goggles, or face shield as appropriate. Have suitable eye wash water available.

SKIN PROTECTION
Avoid prolonged and/or repeated skin contact. If prolonged contact cannot be avoided, wear protective impervious gloves and clothing. Acceptable materials for gloves are neoprene, nitrile, or viton.

RESPIRATORY PROTECTION
Up to 1000 ppm, half mask organic vapor respirator. Up to 5000 ppm, full face organic vapor respirator or full face supplied air respirator. Greater than 5000 ppm, fire fighting, or unknown concentration, self contained breathing apparatus with positive pressure should be used.

OTHER/GENERAL PROTECTION
If there is a likelihood of splashing, an oil resistant clothing should be worn. Never wear oil soaked clothing. Launder or dry clean before wearing. Discard fuel soaked shoes. Affix warning labels on containers in accordance with 29 CFR 1910.1200 (Hazard Communication Standard).

Maintain local or dilution ventilation to keep air concentration below 100 ppm. Loading, unloading, tank gauging, etc., remain upwind. Request assistance of safety and industrial hygiene personnel to determine air concentrations.

INGREDIENT NAME, CAS #, EXPOSURE LIMITS, PERCENT BY VOLUME

Hydrotreated Light Distillate, CAS # 68410-97-9, OSHA-500 ppm, 100.0

This product contains:
*Cyclohexane, CAS # 110-82-7, OSHA-300 ppm, ACGIH-300 ppm
*Nonane, CAS # 111-84-2, ACGIH-200 ppm
*Octane, CAS # 111-65-9, OSHA-400 ppm, ACGIH-300 ppm
*Heptane, CAS # 142-82-5, OSHA-500 ppm, ACGIH-400 ppm
*Pentane, CAS # 109-66-0, OSHA-1000 ppm, ACGIH-600 ppm

9. Physical and Chemical Properties

APPEARANCE
Clear, green liquid.

ODOR
Petroleum Naphtha.

ODOR THRESHOLD
N.D.

BASIC PHYSICAL PROPERTIES
PHYSICAL STATE: Liquid
BOILING POINT: IBP >100°F (>38°C)
MELTING POINT: N/A
VAPOR PRESSURE: (Reid) 5.3 psi @ 100°F
VAPOR DENSITY (AIR=1): 3
SPECIFIC GRAVITY @ 60°F (water=1): 0.7
MOLECULAR WEIGHT: not available
SOLUBILITY (H_2O): negligible
PERCENT VOLATILES: 100%
VISCOSITY: not available

Physical data may vary slightly to meet specifications.

10. Stability and Reactivity

STABILITY: Stable.

CONDITIONS TO AVOID
Sources of ignition.

INCOMPATIBLE MATERIALS
Strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS
Incomplete combustion may produce fumes, smoke, carbon monoxide and other asphyxiants.
HAZARDOUS POLYMERIZATION: will not occur.

11. Toxicological Information

Skin effects
May cause irritation or dermatitis with prolonged and repeated contact.

Oral effects
Tests on similar materials indicate an order of acute oral toxicity.

Inhalation effects
Acute toxicity expected on inhalation.

Medical conditions aggravated by overexposure
Dermatitis and sensitive skin. This product is not listed as carcinogenic or a potential carcinogen by the national toxicology program, by the I.A.R.C. monographs or by OSHA. Nevertheless, good industrial hygienic practices are recommended.

12. Ecological Information

If applied to leaves, this product may kill grasses and small plants by interfering with transpiration and respiration. This product is not toxic to fish but may coat gill structures resulting in suffocation if spilled in shallow, running water. Product may be moderately toxic to amphibians by preventing dermal respiration. This product may cause gastrointestinal distress to birds and mammals through ingestion during pelage grooming.

This product is rapidly biodegradable. Biodegradation is possible within 90 to 120 days in aerobic environments at temperatures above 70˚F (21˚C).

13. Disposal Considerations

RCRA hazardous waste if discarded in its present form. EPA hazardous waste number D001. State and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material**.**

14. Transportation Information

PROPER SHIPPING NAME: Petroleum Distillates, n.o.s., Class 3, UN 1268, PG II
HAZARD CLASS: Class 3 Flammable Liquid
DOT IDENTIFICATION NUMBER: UN1268
DOT SHIPPING LABEL: DOT Hazardous material

15. Regulatory Information

U.S. FEDERAL REGULATORY INFORMATION
SARA 302 Threshold Planning Quantity: NOT APPLICABLE

SARA 304 Reportable Quantity: NOT APPLICABLE SARA TITLE III - Section 311/312 Hazard classes:
Immediate/Acute Health Effects: no
Delayed/Chronic Health Effects: yes
Fire Hazard: yes
Sudden Release of Pressure Hazard: no
Reactivity Hazard: no

EPA/TSCA Inventory: The components of this product are listed on the EPA/TSCA inventory of chemicals.

SARA TITLE III - Section 313 Supplier notification:
The following chemicals are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:
* Cyclohexane 110-82-7 up to 10%

Comprehensive Environmental Response Compensation and Liability Act (CERCLA): The following chemicals in this product are subject to the reporting requirements of CERCLA Section 101(14)(F): Cyclohexane

When this product is used in a mixture, or as an ingredient in another product, or in a manufacturing operation, the petroleum exclusion may terminate and an accidental spill may require reporting to the National Response Center.
STATE LIST DATA - This product contains chemicals which are on the following state lists:
Florida Toxic Substance
Massachusetts Hazardous Substance
Pennsylvania Hazardous Substance
Minnesota Hazardous Substance

STATE LIST DATA - This product contains chemicals which are on the following state lists (continued):
New Jersey RTK Hazardous Substance
New York List of Hazardous Substances
Washington Air Contaminant

16. Other Information

DATE MADE: 2/12/04
DATE REVISED: 6/19/07

The information contained herein is based upon data available to us and reflects our best professional judgment. However, no warranty of merchantability, fitness for any use, or other warranty is expressed or implied regarding the accuracy of such data, the results to be obtained from the use thereof, or that any such use does not infringe any patent. Since the information contained herein may be applied under conditions of use beyond our control and with which we may be unfamiliar, we do not assume any responsibility for the results of such application. This information is furnished upon the condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.