SPILL CONTINGENCY PLAN

BACK RIVER PROJECT

2005

Prepared by:
Miramar Bathurst Resources Ltd.

Updated

January – 2005

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1.0 INTRODUCTION

Plan Purpose

Miramar Bathurst Resources Ltd. and Kinross Gold Corporation, collectively referred to as the JV, entered into an agreement where Miramar Bathurst Resources Ltd. agreed to a sixty percent buy in over the two years by spending 25 million on exploration. Advanced exploration programs have been carried out over the previous years. Similar activities are anticipated in 2005 and beyond as the JV continues to advance the project to eventual production. Miramar Bathurst Resources Ltd. is the operator for this project.

The project area is located approximately 160 km east of Kinross' recently closed Lupin mine and 512 km northeast of Yellowknife at approximately 107°W Longitude and 65°N Latitude (Figure 1). The properties are located within National Topographic System ("NTS") 1:50,000 scale map sheets 76G/3, 9, 10, 13, 14, and 76J/11, 12.

This document is a review and analysis of the preparedness for events, which may occur due to unforeseen circumstances. The plans and predetermined lines of response detail actions to be taken in the event of unintentional materials release during the ongoing exploration program the JV plans to conduct in the area and includes wastewater, sewage treatment, fuel or chemical storage areas. This report addresses all project areas within the JV area including camps and winter roads. The plan will be updated yearly and would address any significant changes in operating plans, should they occur.

As a living document, the Spill Contingency Plan will be amended as required to accommodate change. It first describes the main facilities to be operated as a component of the ongoing exploration drilling programs, followed by contingency measures to support them. On site activity is planned to run from approximately January to September of each year, due mainly to access limitations. Should operations extend beyond these times, and if operational scenarios change, notification will be made to the appropriate agency.

Copies of the 2005 Spill Contingency Plan will be submitted to the Nunavut Water Board, Kitikmeot Inuit Association and INAC. Additional or revised copies of the plan can be obtained through Miramar Mining Corp, 300-899 Harbourside Dr., North Vancouver, BC, V7P 3S1 or at 604-975-2572.

The 2005 Spill Contingency Plan is in effect as of January 21, 2005 and replaces all previous Spill Contingency Plans used under the JV agreement.

A copy of the plan will be posted for all exploration staff and visitors to the JV project site as part of the JV's field orientation program.

Miramar Mining Corporation Environmental Policy

We are committed to engaging in responsible, sustainable business practices in the way we deal with our investors, northern communities, and the environment. To this end, the Board of Directors adopted the following Environmental Policy:

Miramar takes very seriously its responsibility to act as a steward of the environment. Therefore, Miramar will:

- Conduct all operations in an environmentally sound manner which ensures compliance with all applicable national and local regulations
- Assign accountability and responsibility for implementation of the environmental policy and make environmental performance an important factor in the management review process
- Provide adequate resources, personnel and training so that all employees are aware of and able to carry out their responsibilities in accordance with the environmental policy
- Communicate openly with employees, regulatory agencies and the public on environmental issues and address concerns pertaining to potential hazards and impacts
- Work in cooperation with industry, the public and government toward the development of responsible environmental policies, laws, and regulations
- In locations where environmental regulations are absent, apply best management practices to achieve environmental protection consistent with industry standards
- Implement operating practices which incorporate the efficient use of energy and materials and minimizes the use and production of hazardous substances
- Establish and maintain appropriate emergency response plans for all activities and facilities
- Maintain a self-monitoring program at each facility to ensure compliance
- Conduct periodic environmental assessments at all Miramar facilities and develop and implement action plans to correct potential deficiencies in a timely manner
- Encourage all employees to report to management any known or suspicious departure from this policy or related procedures

JV Policy on Initiation Cleanup activities

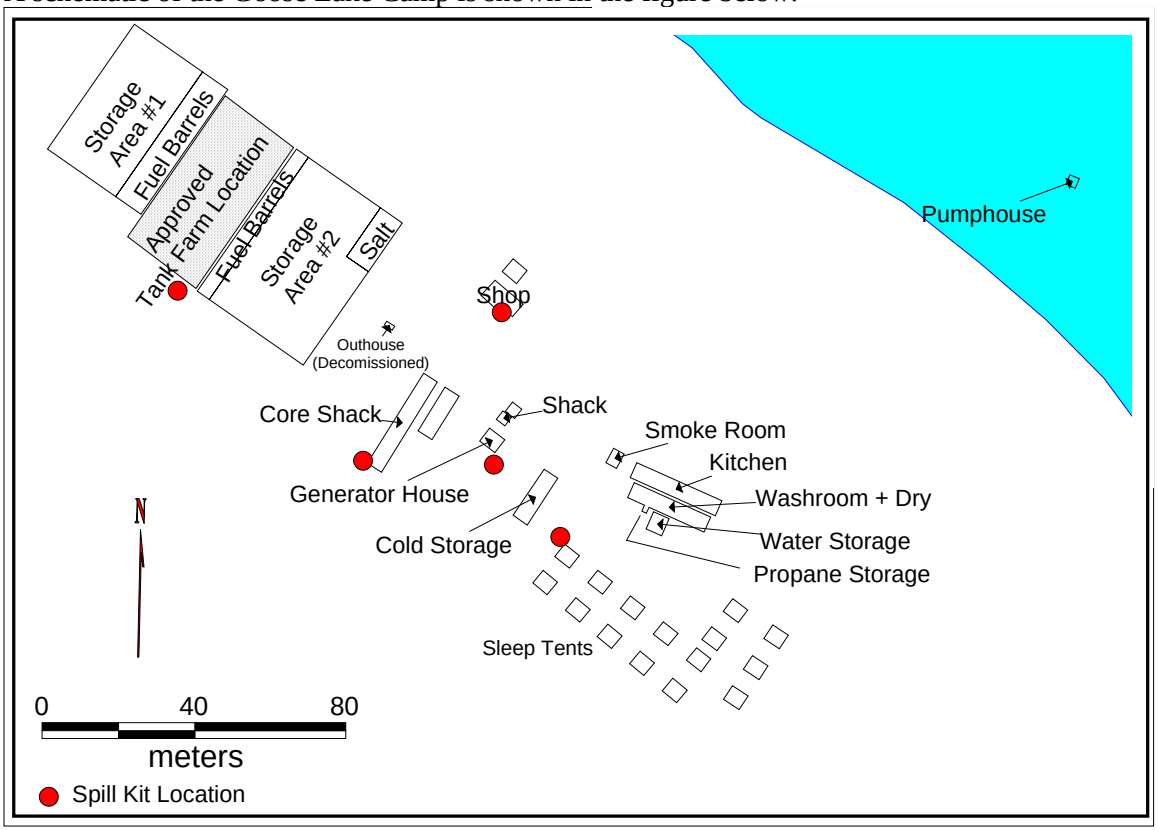
It is the policy of the JV to initiate clean up activity when, in the opinion of management, the JV is clearly associated, or likely associated with the spilled product. The guiding principles of the JV Spill Contingency Plan is to comply with existing regulations to ensure protection of the environment, and to keep employees, government officials and the public aware of our plans.

2.0 PROJECT FACILITY DESCRIPTION

Existing Facilities and Previous Work

The JV acquired existing camps constructed by Kit Resources. The main operating camp is at Goose Lake; another old, smaller camp exists at George Lake. The Goose Lake Camp was upgraded either by maintenance done on existing tent frames or adding new Jutland tent-type structures. Both camps will be rehabilitated to the extent needed for this year's exploration program. The emergency/survival weatherhaven skid mounted shelters will be dragged or lifted back to the nearest camp when the exploration program is finished for the year. With the amount of drilling going on it in this area it could mean that a prefabricated service building will have to be constructed for maintenance on the drills and rebuilds of broken machines.

A schematic of the Goose Lake Camp is shown in the figure below.



Domestic Greywater and Sewage

The Goose Lake Camp handles sewage and Greywater separately. Pacto toilets with manufacturer's polyvinyl bags are used for sewage. The sealed bags are then incinerated. If more advanced exploration is required, a Rotating Biological Contractor (RCB) will be used for Greywater and sewage handling. Greywater is discharged to a Greywater sump which is limed every fall and allowed to evaporate or leach into the surrounding tundra.

The George Lake Camp handles sewage and Greywater as follows. The sewage is placed in a Shorted trench under an outhouse, this will continue until the exploration either develops a mine or all interest in the property is gone, at which time the outhouse will be burned and the trench

covered. If the interest increases to do more exploration then a Rotating Biological Contractor (RCB) will have to set up for Greywater and sewage handling. Right now the Greywater is discharged to a Greywater sump which is limed every fall and allowed to evaporate or leach into the surrounding tundra.

Solid Waste

Combustible solid wastes generated from the camp facilities have been incinerated. Commercial incinerators are strategically located at each Goose Lake camp while George Lake still uses a burning barrel. Products such as putrescible domestic and office waste are burned. Non-combustible waste including scrap metal, non-reusable barrels, incinerator ash etc. are typically removed from site using back-haul flights to Yellowknife.

Although the potential of waste rock, currently stored at George Lake core storage or Goose Lake core storage, to be acid producing is unlikely, any such waste would be disposed of in an approved location and under acceptable practices.

Fuel Storage

Diesel fuel is required to generate power on-site, heat buildings and to fuel mobile equipment. The diesel fuel storage for the 2004 exploration program consisted of storage in 205 litre drums. In 2005, a tank farm consisting of 5-70,000 L enviro-tanks within a dyke will be constructed. Current Land Use Permits allowing enviro-tanks at the Goose Lake Camp are in place, reducing the number of barrels required and therefore lessening the possibility of a leaking container. With bulk tanks in place, barrels will still be used for camp tent heating and remote drill operations.

Goose Lake Camp has the following fuel on site for start up in 2005.

Fuel	Quantity Remaining	Units
Gasoline	16	drums
Jet B	265	drums
Diesel	275	drums
Propane 500 gal tanks	2	tanks

Fuel will be offloaded from a frozen-in barge in Bathurst Inlet and transported overland to the Goose Lake Camp. Fuel will be pumped from the barge with electric pumps into 16000L fuel trucks after the tank farm is constructed. In operational usage, each tank will be filled to a maximum of 66,000 litres, bringing the effective total fuel stored to 330,000 litres. All tanks will contain diesel fuel. Fuel will be transferred from the bulk tanks to 205 litre drums and 1000 litre enviro-tanks to use at other locations, including operating drills, machinery and heating buildings.

Sound environmental practices for installation and operation of above ground storage tank systems, as described in the Alberta Energy and Utilities Board Guide 55- Storage Requirements for the Upstream Petroleum Industry December 2001, will be used. Practices described by the CCME publication, “Environmental Code of Practice for Above Ground and Underground Storage Tanks Systems containing Petroleum Product and Allied Petroleum Products” (PN 1326, 2003), are also being implemented at all stages of construction and operational use.

Sealed barrels of Jet B fuel will be kept on-site for the helicopter. Specialized oils and greases used by the drilling contractors are strategically stored in the appropriate manner. Inventories of fuel at each site are dynamic.

All barrels are located at least 30 metres above the high water mark of any water body. Please see the attached site layout map for storage areas.

Chemicals

The JV is committed to the safe and proper handling of waste materials to ensure minimal environmental impact and land disturbance. Waste chemicals that require special attention and handling are waste oil, hydraulic oil, lubricating oils, calcium hypochlorite, grease and ethylene glycol.

A waste oil burner will be installed at both George Lake camp and the Goose Lake camp and the heat generated will be used to heat some of the administration tents. Waste oil and oil from filters not used in the waste oil-burner mentioned above; will continue to be used as incinerator fuel. This eliminates the need to remove the waste oil from the project area, resulting in considerable cost savings. Drained spent oil filters will be stored in drums for removal from the site for disposal at an authorized disposal facility or could be cleaned and incinerated. There are no reagents used on the site at this time.

Calcium Chloride (commonly called Rock Salt) is added to the fresh water to form a brine solution that acts as antifreeze when drilling in permafrost conditions. Calcium Chloride has recently been listed by the Canadian Environmental Protection Act as a toxic substance. All sumps containing Calcium Chloride will be properly located in such a manner as to s\ensure the contents will not enter any water body. For start-up at Goose Lake Camp, there are 3,164 bags of Calcium Chloride on-site.

Explosive products, when on-site, will be stored in appropriate facilities at designated explosives storage site(s).

Material Safety Data Sheets (MSDS) will be collected and kept at the site for all chemicals and fuel products brought on site. Appropriate storage and handling of these products will be undertaken. The action plans for spills of diesel fuel, lubricating and hydraulic oils and ethylene glycol are also included at the end of this report.

Please see Appendix A for applicable MSDS sheets.

3.0 SYSTEM FAILURE AND PREVENTATIVE MEASURES

Domestic Sewage

There is little chance of having a problem with sewage under an outhouse as the structure covers the trench and each year the sewage generated during the summer is frozen into the esker during the winter. Pacto toilets are monitored constantly for any system failure; any blockages are rectified within hours. When the Pacto toilets are not in service, 15 gallon pails and “Kitchen Catcher” type bags will be used. The used bags are then incinerated in the same manner as the Pacto liners. The Grey-water being pumped into a sump can be inviting to wildlife prior to

evaporation or leaching away so each fall lime should be added to neutralize any biologically active materials.

Visual inspection of the pipeline will be carried out on a weekly basis. The operations manual for Grey-water treatment will be followed.

Solid Waste

Failures may occur in the handling of solid waste in the following modes:

- Incinerator at Goose lake fails;
- Power outage;
- Wildlife start coming to the Grey-water sump;
- Accidental damage to the incinerator and it components, or the waste oil heater;
- Mechanical breakdown;
- Improper maintenance.

Visual inspection of the incinerator and its combustion products will be carried out on a regular basis. The operations manual protocols for the incinerator will be followed.

Fuel

Fuel spills could potentially occur from:

- Fuel storage containment (tanks, barrels) leaks;
- Spills during drum transport from aircraft to fuel storage area; and
- Spills from vehicles of equipment as a result of accidents;
- Spills during fuel transfer from barrels or tanks to equipment or heaters;
- Accidental discharge during fuel transfer from the barge to fuel trucks;
- Spills during transfer from fuel trucks to the tank farm.

Spills occurring during fuel handling, transfer or storage operations will be minimized by:

- Proper storage of barrels;
- Polyethylene Containment Tubs for fuel drums used to heat tents
- Regular inspections of the storage facilities, tank farm and barrels;
- Staff training in proper fuel handling procedures;
- Spill response training for personnel associated with fuel handling;
- Immediate cleanup of minor spills;
- Spill Kits located at all transfer stations, including the barge landing site, near any barrel caches and at the tank farm;
- Maintaining fuel storage cache for emergencies.

With the exception of the barge landing site, potential for spills affecting surface waters is low, as fuel storage and transfer points are located away from watercourses and lakes. Close inspection of fuel transfer activities will be undertaken during all times while fuel is being pumped/transferred to the equipment.

Chemicals

Any chemicals brought on site are stored in manufacturers approved packaging. Leaks may occur, causing minor spills of chemical product in storage. More likely a leak will occur during the transfer of chemicals or from accidental failure of containers.

The JV provides training to its staff in product handling and inspection procedures, which we feel, will result in reduced occurrences of chemical spills.

4.0 INITIAL ACTIONS

In the event of any leak, spill or system failure, steps taken by company personnel at the spill site are as follows:

- Be alert, ensure your safety and the safety of others first;
- Assess the hazard to persons in the vicinity of the spill or leak;
- Assess nature and status of the spill, leak or system failure and measures to be taken to bring the situation under control;
- When safe to do so, stop the flow of the spilled material;
- Report the spill, leak of container, immediately to the On-Scene Coordinator so that person can ensure that the responsible regulator is notified by contacting the NWT 24-Hour Spill Line at (867) 920-8130 or fax (867) 873-6924 and DIAND Water Resources Inspector at (867)975-4298;
- Resume safe, effective actions to contain, stop the flow of spilled product or clean up the incident; and
- Record all information on the status of the situation. Take photographs of the site (if possible) before the clean up and after the clean up has been completed.

The above information is available as a separate sheet for posting, included in Appendix C.

5.0 SYSTEM MALFUNTION RESPONSES

Domestic Sewage and Solid waste

Any problems with the sewage disposal system such as the outhouse being blown over, power going off, material cave in under the outhouse running out of room etc., will be immediately reported to the On-Scene Coordinator/Site Superintendent. Problems encountered with the incinerator at Goose Lake camp will also be reported to the On-Scene Coordinator/Site Superintendent. At George Lake it will be the delivery pipe to the Greywater sump freezing up or the sump filling with ice and blocking the outflow or the sump overflowing, etc,. The On-Scene Coordinator/Site Superintendent will refer to the Operation and Maintenance Manual and take appropriate action.

In the event of a power failure, the stand by generator will be put into operation as soon as possible. Similarly, in the case of a pump failure, the back-up pump will be put on-line. Any Grey water drainage problems will be processed as quickly as possible to minimize the chance of a spill within the accommodation facility. However, if necessary, appropriate safety equipment and personnel protective clothing will be available to site personnel.

Fuel Spill

Fuel spills, leaks at storage facilities or vehicle accidents will be handled by following these steps:

- ACTIVATE THE SPILL CONTINGENCY PLAN.
- Identify the source of the leak or spill;
- Contact the On-Scene Coordinator/Site Superintendent
- Stop leaks from tank or barrel by:
    - Turning off valves;
    - Utilizing patching kits to seal leaks
    - Placing plastic sheeting at the foot of the tank or barrel to prevent seepage into the ground: and
- Contain the spill and the source if possible;
- Take photographs of the spill site before and after the clean up.

Further information on the handling of fuel spills is detailed in section 10 of this report.

Fuel Spills on Land

Fuel spills on land (gravel, rock, soil, vegetation) can be contained by:

- Constructing temporary berms and deploying absorbents;
- Stains on rock can be soaked up with absorbent mats. The mats should be placed in empty drums for storage prior to incineration; and
- Contaminated soil and vegetation, where appropriate, be disposed of at an approved facility.

Fuel Spills on Snow

Snow can be an effective natural absorbent for spilled fuel:

- Temporary berms can be made from snow by compacting it and spraying with water to create an ice barrier or lining the snow with plastic;
- The snow-fuel mixture can be scraped up and stored in a lined area or in drums for future disposal; and
- Mark or stake the area affected by the spill so that the site can be revisited and re-evaluated once the snow has melted.

Fuel Spills on Water

It is important to immediately limit the area of the spill on water. Booms can be drawn in to encircle spilled fuel. The absorbent mats are hydrophobic (absorbs hydrocarbons and repel water).

- Deploy booms to contain the spill area. Boom effectiveness will be limited by winds, waves and other factors; and
- Use absorbent mats and similar materials to capture small spills on water.

Fuel Spills on Ice

Fuel spills on ice may occur when offloading fuel from the barge. Where a spill occurs on ice, snow can be compacted around the edge of the spill to serve as a berm. The ice provides a good barrier to any seepage of fuel into the water, but the contaminated snow/ice must be scraped up as soon as possible.

- Permission may be given from the government to burn off fuel (contact the NWT 24 Hour Spill Line). Remaining contaminated snow can be placed in drums in a lined berm (on land):

Chemical Spills

Assess the hazard of the spilled material by referring to the revenant MSDS sheet and application action plan:

- If the chemical is hazardous, ensure personnel protective equipment is appropriate utilized (latex gloves, eye protection, etc.) before approaching the spill;
- Use absorbent mats to soak up spilled liquids;
- Plastic sheeting can be utilized to prevent chemicals from being blown around;
- Neutralize acids or caustics; and
- Place spilled material, absorbents, and rags in an open-top drum for storage an ultimate disposal of at an approved location.

6.0RESPONSE EQUIPMENT

General Equipment

Heavy equipment used in exploration drilling operations will be available on-site for emergency use to respond to spill incidents. Helicopters and fixed-wing aircraft could also be available. Presently, the facilities are well equipped to respond to emergencies or spills.

Spill Kits

Complete spill kits are located as follows:

Goose Lake Camp
- Barrel storage facility
- Jet B storage facility
- Generator shack
- Core logging workshop
- Adjacent to Sleep Tent Area

George Lake Camp
- Barrel storage facility
- Jet B storage facility
- Generator Shack
- Core logging workshop
- Adjacent to Sleep Tent Area

General

- Alltrack support vehicle
- Operating drill rigs
- Re-fueling cat trains

2005 Additional Anticipated Locations of the Spill Kits Include:

- Barge Landing Site
- Tank Farm at Goose Lake

The following Items are contained in each Spill Kit:

1 – 45 gal, 16 Gauge Open Top Drum, c/w Bolting Ring & gasket;
1 - 48" x 48" x 1/16" Neoprene Pad (drain Stop);
20 – Short Putty Epoxy Sticks;
Splash Protective Goggles
1 - Pkg. - Polyethylene Disposable Bags (5 ml) 10 per Package;
1 – Shovel (Spark Proof);
1 – Case T-123" x 10' absorbent Boom, 4-Booms/Case;
1 – Pkg. – Universal absorbent Mats, 16 ½" x 20", 100 Mats per Package; and
1 – Roll – Oil only absorbent mats 150' x 33":

7.0 RESPONSE ORGANIZATION

The members of the Spill Response Team and their duties are listed below for the Back River Project.

Internal Contacts:

Field Contacts:

Spill Cleanup Supervisor / On-Scene Coordinator:

Goose Lake camp:	to be provided when available
Phone:	to be provided when available
Fax:	to be provided when available
George Lake camp:	to be provided when available
Phone:	to be provided when available
Fax:	to be provided when available

Site Superintendent:

Goose Lake camp:	to be provided when available
Phone:	to be provided when available
Fax:	to be provided when available
E-Mail	to be provided when available
George Lake camp:	to be provided when available
Phone:	to be provided when available
Fax:	to be provided when available
E-Mail	to be provided when available

Project Manager:

Goose Lake camp:	to be provided when available
George Lake camp:	to be provided when available
Phone:	to be provided when available
Fax:	to be provided when available
E-Mail	to be provided when available

Emergency Response Team:

Approximately 10 personnel will be available on-site to assist with spill response activities.

Office Contact:

Exploration Manager: John Wakeford
Telephone: 604-985-2572
Fax: 604-980-0731
E-Mail: jwakeford@miramarmining.com

Manager, Environmental Affairs: *please contact John Wakeford*
Miramar Mining Corporation
Telephone: (604) 985-2572
Fax: (604) 980-0731

8.0 RESPONSIBLITIES

All Employees (First Responders):

- Identify the source of the spill;
- Assess the initial severity of the spill and any safety concerns;
- Report all spills immediately to Supervisor;
- Determine the size of the spill and stop or contain it, if possible;
- Participate in spill response as member of cleanup crew.

Emergency Response Team (Spill Cleanup Crew):

- Conduct cleanup of spills under direction of Spill Cleanup Supervisor/Site Superintendent;
- Deploy boom, absorbent pads and other equipment and materials as required;
- Take appropriate measures;

- Continue cleanup as directed by Spill Cleanup Supervisor/Site Superintendent or until relieved.

Spill cleanup Supervisor /On Scene Coordinator:

- Report spill to Project Manager;
- Obtain GPS coordinates for all spills;
- Obtain photographs of spill site before clean up starts if possible and after the cleanup has been completed. Take pictures of undisturbed area beside the spill area for a comparison. If spill occurs on snow, stake or otherwise identify the affected area so that it can be evaluated once the snow melts;
- Assist in initial and ongoing response efforts;
- Supervise emergency response team;
- With work crew, take initial action to remove the source and contain spill;
- Continue actions until relieved by other personnel;
- Decide with On-Scene Coordinator/Site Superintendent if mobilization of additional equipment from Spill Response Organization or Contractor is warranted;
- Assess whether burning is a viable cleanup measure; and
- Consult with Manager, Environmental Affairs, Miramar Mining Corporation.

Site Superintendent:

- Reports spill to the NWT 24-Hour Spill Report Line at (867) 920-8130;
- Reports spill to DIAND Water Resources Inspector at (867)975-4298;
- Contact the Emergency Response Team if the situation requires;
- Records the time of the report, source of information and details on location, size, type of spill and any other information and details on the spill report form;
- Together with the Spill Cleanup Supervisor, and Project Manager decide if additional equipment and manpower is required to contain and cleanup spills;
- Notifies Exploration Manager and the Manager, Environmental Affairs/Designate;
- Oversees completion and distribution of spill report; and
- Ensures investigation and identifies measure to prevent similar spills.

Site Superintendent, con'd

- Ensures cleanup is completed to JV objectives and standards;
- Provides update to Manager, Environmental Affairs/Designate;
- Ensures that copies of all spill reports and follow-up reports area submitted to Nunavut Water Board and Kitikmeot Inuit Association;
- Liase with NWT Spill Line, Lead Agency (DIAND) and other applicable agencies with regard to on-going cleanup activities;
- Co-ordinate inspections and spill closure by Lead Agency and/or other applicable agency;
- Conducts ongoing monitoring of cleanup operations leading to close-out;
- Ensures Emergency Response Team is adequately trained in spill response; and
- Organizes spill response training and exercises approved by regulating agencies.

Manager, Environmental Affairs/Designate

- Compiles internal reports as required;
- Submits written report required to NWB Water Resources Inspector within 30 days of the spill;
- Updates and distributes Spill Contingency Plans;
- Provides advice when requested to the Exploration Manager, the On-Scene Coordinator, the Spill Cleanup Supervisor and the Site Superintendent;
- Assists in developing effective spill management and prevention practices; and
- Provides advice, when requested, to the On-Scene Coordinator, the Spill Cleanup Supervisor and the Site Superintendent on storage and disposal options.

Legal Counsel

Advises the Exploration Manager and the Manager, Environmental Affairs on matters related to:

- Legislative authority of various government agencies;
- Questions of due diligence;
- Costs/fines and liabilities, including penalties associated with regulations; and

- Consults with the corporation coordinator and advises on matter related to insurance.

Additional assistance may be obtained as necessary from the following organizations:

Potential Back River Joint Venture Contractors: (Actual contractor contacts will be named when chosen)

Discovery Mining Services, Yellowknife Rod Brown	Telephone (867) 920-4600
Shell Canada, Mobile Environmental Response Steve Bassett	Telephone (867) 874-2562
Major Midwest drilling, Gordon Cyr	Telephone (204) 885-7532
Kitnuna Wilf Wilcox	Telephone (867) 983-2331
Nuna Logistics Ltd. Court Smith, John Zigarick	Telephone (867) 682-4667

Potential Local Air Charter

Air Tindi, Dispatch	Telephone (867) 669-8218
NWT Air (First Air), dispatch	Telephone (867) 669-6645
First Air Dispatch	Telephone (867) 669-6682
Nunasi Helicopters, Martin Knutsen	Telephone (867) 873-3306
Kitikmeot-Great Slave Helicopters	Telephone (867) 873-2081
Summit Air, Jamie Tate	Telephone (867) 667-7327 Cellular (867) 333-1503

Potential Equipment and Material Suppliers:

Dupont (Fuel Dye) Ray Buckland	Telephone (905) 821-5660
Frontier Mining (Sorbents)	Telephone (867) 920-7617
Acklands (sorbents)	Telephone (867) 873-4100 Pager: (867) 920-5359

9.0 REPORTING PROCEDURES

The Spill Response Team must be notified immediately of any spill. Communication on-site will be via radio and other centers by satellite phone. The Site Superintendent or designate will ensure that each spill is reported to the NWT 24-Hour Spill Report Line at (867) 920-8130 and that a Northwest Territories Spill Report Form is filled out as completely as possible. The Site Superintendent or Designate will report all spill to DIAND Water Resources Inspector at (867) 975-4298 at that time.

The Manager, Environmental Affairs/Designate submits written report of spills as required to NWB Water Resources Inspector within 30 days of the spill, as per conditions listed in applicable water use licenses. A copy is also sent to KIA, if they are the surface rights holder of the land where the spill occurred.

It is the intention of the JV to report all spills over 25 litres and to maintain an inventory of all spills less than 25 litres, which can be viewed by any Inspector/agency representative.

CONTACT INFORMATION

Northwest Territories/Nunavut 24 Hour Spill Report Line	Tel (867) 920-8130 Fax (867) 873-6924
Nunavut Water Board	Tel (867) 360-6338 Fax (867) 360-6369
Environment Canada Environmental Protection Branch	Tel (867) 669-4700 Fax (867) 873-8185
Manager Pollution Control & Air Quality Environmental Protection Government of Nunavut	Tel (867) 975-5907 Fax (867) 975-5981
Indian and Northern Affairs Canada Water Resources Manager Nunavut Regional Office	Tel (867) 975-4550 Fax (867) 975-4585
Indian and Northern Affairs Canada Land Administration Minister	Tel (867) 975-4280 Fax (867) 975-4286
Nunavut Regional Office Department of Fisheries and Oceans Water Resources Inspector Nunavut Regional Office	Tel (867) 979-8000 Fax (867) 979-8039 Tel (867) 975-4298

Other contacts which may be of some assistance:

Nunavut/NWT

Resources, Wildlife & Economic development (RWED)

Environmental Protection Services Tel (867) 873-7654

Dept. Sustainable Development, Iqaluit	Tel (867) 979-5076

Workers Compensation Board, Yellowknife	Telephone: (867) 920-3888
Sylvester Wong, Director Prevention services	Telephone: (867) 669-4408
Peter Bengts, Mine Safety	Telephone: (867) 669-4408
RWED Regional Superintendent	Telephone: (867) 920-6134
RWED Cambridge Bay	Telephone: (867) 983-7315
	Fax: (867) 983-2802
RWED Kugluktuk	Telephone: (867) 982-7251
	Fax: (867) 982-3701
Kitikmeot Inuit Association (KIA)	Telephone: (867) 982-3310
Jack Kaniak, Lands Manager	Fax; (867) 982-3311
Nunavut Water Board	Telephone: (867) 360-6338
Philippe di Pizzo, Executive Director	Fax: (867) 360-6369
Bruce Stebbing, Office of the Fire Marshall	Telephone: (867) 873-7030

Federal Government:

RCMP (Yellowknife)	Telephone: (867) 669-1111
	Fax: (867) 669-5224
RCMP (Cambridge Bay)	Telephone: (867) 983-2111
	Fax: (867) 983-2498
Resource Management Officer	Telephone: (867) 983-7314
Indian & Northern Affairs Canada (DIAND)	Telephone: (867) 975-4546
Environment Canada	Telephone: (867) 920-4700
	Telephone: (867) 979-8000
	Fax: (867) 989-8039

10.0 TRAINING AND SPILL EXCERCISES

Training

All members of the Spill Response Team will be trained and be familiar with the spill response equipment, including their location and access, the Spill Contingency Plan and appropriate spill response methodologies. During 2005 the onsite-training program for the Back River Project will be initiated at each camp at the start of the field program. The training program includes the dissemination of information regarding the Spill Contingency Plan, the NT environmental Protection and Spill regulation, the viewing of RWED spill response videos, and the field application of suitable techniques.

All JV personnel will be familiar with spill reporting requirements.

Fuel handling crews will be fully trained in the safe operation of these facilities, spill prevention techniques and initial spill response. Similarly, the staff involved in wastewater treatment operations will be trained in the safe and effective operation of these facilities.

Spill Exercises

The JV will conduct regular spill exercises to test the response of the Spill Response Team to manage fuel and other system failures.

Reports will be made by the Site Superintendent or designate, noting the response time, personnel, and problems or deficiencies encountered. These reports will be used to evaluate the ability to respond to spills and determine areas necessary for improvement.

11.0 ACTION PLAN FOR SPILL OF DIESEL FUEL

Initial Spill Responses:

- STOP the flow if possible;
- CONTAIN flow of oil by dyking, barricading or blocking flow by any means available. Use earth moving equipment if practical;
- ELIMINATE, open flame ignition sources;
- If flow has reached any natural stream, mobilize team to deploy river boom, and sorbent booms; and
- If possible, pump fuel into other appropriate tankage/containers.

Hazards:

- Flammable
- Slightly toxic by ingestion, highly toxic if aspired

Action for Fire:

- Use carbon dioxide, dry chemical, foam, or water spray (fog), although water may spread the fire;
- Use fog streams to protect rescue teams and trapped people;
- Use water to cool surface of tanks;
- Divert the diesel fuel to an open area and let it burn off under controlled conditions;
- If the fire is put out before all diesel is consumed, beware of re-ignition;
- Where diesel fuel is running downhill, try to contain it as quickly as possible; and
- Rubber tires are almost impossible to extinguish, have affected vehicles removed from the danger zone.

Recovery:

- Unburned diesel fuel can be soaked up by sand and peat moss, of by chemical sorbents such as Grabil or Conwed;
- If practical, contaminated soil should be excavated;
- Diesel fuel entering the ground should be recovered by digging sumps or trenches; and

- Diesel fuel on a water surface should be recovered by skimmers or sorbent booms. (See Section on Recovery of Oil Spills)

Disposal:

- Incineration under controlled conditions; and
- Burial at an approved site.

Properties:

- Chemical composition mixture of hydrocarbons in the range C9 to C18;
- Clear, oily liquid; and
- Not soluble, floats on water

Environmental Threat:

- Moderately toxic to fish and other aquatic organisms;
- Harmful to waterfowl; and
- May create visual film on water and shorelines.

Containers:

- Transported by appropriate methods to acceptable storage, (typically 205 litre drums); and
- Bulk transportation and storage.

12.0 ACTION PLAN FOR ETHYLENE GLYCOL (ANTIFREEZE) SPILL

Initial Spill response:

- STOP the flow at source if possible;
- ELIMINATE open flame ignition sources;
- CONTAIN flow of liquid by dyking, barricading or blocking flow by any means available; and
- PREVENT antifreeze from entering any flowing streams

Hazards:

- Moderately toxic by ingestion and inhalation; and
- Flammable.

Action for Fire:

- Use carbon dioxide, dry chemical, foam or water spray (fog);

Recovery:

- Ethylene glycol antifreeze can be soaked up by peat moss or by commercial sorbents such as Hazorb; and
- Access to spilled or recovered ethylene glycol by mammals should be prevented.

Disposal:

- Incineration under controlled conditions; and
- Burial at an approved site.

Appendix A – MSDS SHEETS

- Calcium Chloride
- Diesel
- Gasoline
- Propane
- Jet B

MATERIAL SAFETY DATA SHEET

Calcium Chloride

Section 01 - Chemical And Product And Company Information

Product Identifier …….. Calcium Chloride **Product Use** …….. Industrial uses; drilling mud additives; workover fluids; completion fluids; ice melt; refrigeration. **Supplier Name**…… ClearTech Industries Inc. 2303 Hanselman Avenue Saskatoon SK S7l 5Z3 Canada **Prepared By**.....…….. ClearTech Industries Inc. Technical Department Phone: (306)664-2522 **Preparation Date**.....…… March 3, 2003 **24-Hour Emergency Phone**……. 306-664-2522

Section 02 - Composition / Information on Ingredients

Hazardous Ingredients..... Calcium Chloride Sodium Chloride Potassium Chloride Strontium Chloride 77-94% 1-2% 2-3% 1% **CAS Number**..... Calcium Chloride Sodium Chloride Potassium Chloride Strontium Chloride 10043-52-4 7647-14-5 7447-40-7 10476-85-4 **Synonym (s)**..... Calcium chloride high test fines; calcium chloride high test powder; calcium chloride 77%; Ice Melt

Section 03 - Hazard Identification

Inhalation..... Dust or mist inhalation may irritate nose, throat, and lungs **Skin Contact / Absorption**..... May cause skin irritation. Under conditions of prolonged contact or when moisture is present, superficial burns may result. Contact with abraded skin or cuts can cause severe necrosis. **Eye Contact**..... May irritate or burn eyes causing corneal injury which may heal slowly. **Ingestion**..... May irritate gastrointestinal tract or cause ulcerations. **Exposure Limits**..... Nuisance particulate level of 10 mg/m3

Section 04 - First Aid Measures

Inhalation..... Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention. **Skin Contact / Absorption**…… Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists **Eye Contact**..... Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention **Ingestion**..... Give large amounts of water. Do not give anything by mouth to an unconscious or convulsing person. Immediately phone your local poison control center. Vomiting may need to be induced under the direction of medical personnel.

Section 05 - Fire Fighting

Conditions of Flammability…….. Non-flammable **Means of Extinction**..... Product does not burn. Use appropriate extinguishing media for material that is supplying the fuel to the fire. **Flash Point**..... Not Applicable **Auto-ignition Temperature**…… Not Applicable **Upper Flammable Limit** …… Not Applicable **Lower Flammable Limit**..…… Not Applicable

Product # CCHT Page 3 of 6 **Hazardous Combustible Products**. None known **Special Fire Fighting Procedures**... Wear NIOSH-approved self-contained breathing Apparatus and protective clothing. **Explosion Hazards**…… Only explosive when mixed with Furan 2-peroxycarboxylic acid

Section 06 - Accidental Release Measures

Leak / Spill..... Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so. Prevent material from entering sewers. **Deactivating Materials**..... Not Available

Section 07 - Handling and Storage

Handling Procedures..... Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure. **Storage Requirements**..... Store in a cool, dry, well-ventilated place. Keep container tightly closed, and away from incompatible materials. Prolonged storage may cause product to cake and become wet.

Section 08 - Personal Protection and Exposure Controls

Protective Equipment Eyes..... Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury. **Respiratory**..... NIOSH-approved respirator for dust should be worn, if needed.
Gloves..... Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.
Clothing..... Body suits, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.
Footwear..... Impervious boots of chemically resistant material should be worn at all times
Other..... No other information available

 Engineering Controls **Ventilation Requirements**…….... Mechanical ventilation (dilution or local exhaust), process or personnel enclosure, and control of process conditions. Supply sufficient replacement air to make up for air removed by exhaust systems. **Other**…….... Emergency shower and eyewash should be in close proximity.

Section 09 - Physical and Chemical Properties

Physical State.....…….…….. Solid **Odour and Appearance**…..…….. White odourless solid pellets **Odour Threshold**...……..... Not Applicable **Specific Gravity (Water=1)**…… 2.15 **Vapor Pressure (mm Hg, 20C)**……. Not Applicable **Vapor Density (Air=1)**.…….. Not Applicable **Evaporation Rate**.....…….…… Not Applicable **Boiling Point**.....…….. >1600°C **Freeze/Melting Point**...…….. 772°C **pH.**.....…… >7 for an aqueous solution **Water/Oil Distribution Coefficient**... Not Available **Bulk Density**.....…… Not Available **% Volatiles by Volume**……..…… 0 **Solubility in Water**..……... 745g/L at 20°C **Molecular Formula**.....…….. $CaCl_2$ **Molecular Weight**.....…….. 110.99

Section 10 - Stability and Reactivity

Stability..... Very Stable **Incompatibility**..... Incompatible with sulphuric acid, water-reactive materials such as sodium, methyl vinyl ether, and zinc as in galvanized iron.

 Hazardous Products of Decomposition With sulphuric acid, yields hydrogen chloride gas. With water-reactive materials, causes an exothermic reaction. With methyl vinyl ether, starts runaway polymerization reaction. With zinc, yields explosive hydrogen gas. **Polymerization**..... Will not occur

Section 11 - Toxicological Information

Irritancy..... Mild irritant. **Sensitization**..... Not Available **Chronic/Acute Effects**..... Overexposure to calcium chloride may cause stomach disturbances. **Synergistic Materials**..... Not Available **Animal Toxicity Data**..... LD_{50}(oral, rat) = 1400 mg/kg (anhydrous calcium chloride) LD_{50}(oral, mouse) = 1940 mg/kg (anhydrous calcium chloride) LD_{50}(dermal, rabbit) > 5000 mg/kg (anhydrous calcium chloride) LD_{50}(intravenous, rat) = 123 mg/kg (strontium) **Carcinogenicity**..... Not considered to be carcinogenic by NTP, IARC, OSHA. **Reproductive Toxicity**..... Not Available **Teratogenicity**..... Not Available **Mutagenicity**..... Not Available

Section 12 - Ecological Information

Fish Toxicity..... Not Available **Biodegradability**..... Not Available **Environmental Effects**..... Not Available

Section 13 - Disposal Considerations

Waste Disposal..... Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transportation Information

TDG Classification Class..... Not a dangerous good.
Group..... Not a dangerous good. **PIN Number**..... Not a dangerous good. **Other**..... Secure containers (full and/or empty) with suitable hold down devises during shipment.

Section 15 - Regulatory Information

WHMIS Classification..... D2 **NOTE: THE PRODUCT LISTED ON THIS MSDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS MSDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS**

Section 16 - Other Information

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

ClearTech Industries Inc. - Locations

Corporate Head Office: 2302 Hanselman Avenue, Saskatoon, SK, S7L 5Z3 Phone: 306-664-2522 Fax: 306-665-6216 www.ClearTech.ca

Location	Address	Postal Code	Phone Number	Fax Number
Richmond BC	12431 Horseshoe way	V7A 4X6	604-272-4000	604-272-4596
Calgary AB	5516E - 40th St. S.E.	T2C 2A1	403-279-1096	403-236-0989
Edmonton AB	11750 - 180th Street	T5S 1N7	780-452-6000	780-452-4600
Saskatoon SK	2302 Hanselman Avenue	S7L 5Z3	306-933-0177	306-933-3282
Regina SK	555 Henderson Drive	S42 5X2	306-721-7737	306-721-8611
Winnipeg MB	340 Saulteaux Crescent	R3J 3T2	204-987-9777	204-987-9770
Mississauga ON	7480 Bath Road	L4T 1L2	905-612-0566	905-612-0575

24 Hour Emergency Number - All Locations - 306-664-2522

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **S-1 Synthetic Diesel Fuel**
Synonyms: Synthetic Diesel Fuel—Winter Grade, Synthetic Diesel Fuel-- Arctic Grade
Product Code: not applicable
MSDS Code: not applicable
Chemical Family: Hydrocarbon

Responsible Party: Syntroleum® Corporation
4322 South 49th West Ave.
Tulsa, OK 74107

For product information contact Syntroleum® Corporation:
8am – 4pm, U.S. Central Time, Mon – Fri: 918-764-4358

EMERGENCY INFORMATION

24-Hour Emergency Telephone Number:

For Chemical Emergencies:
Spill, Leak, Fire or Accident
Call CHEMTREC
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

Health Hazards: Aspiration hazard if swallowed. Can enter lungs and cause damage. Avoid contact with eyes. Do not taste or swallow. Wash thoroughly after handling.

Physical Hazards: OSHA combustible liquid. Keep away from heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment).

Physical Form: Liquid
Appearance: Colorless *(may contain a dye)*
Odor: Odorless to mild paraffin

NFPA HAZARD CLASS: Health
0 = no special hazards Flammability
4 = maximum hazard class Reactivity

2. COMPOSITION / INFORMATION ON INGREDIENTS

#	Component	CAS No.	Approx. Wt%
1	Fuel, diesel, C_{8-28}-alkane rich	437986-25-9	100

Note 1: May contain up to 0.5 wt% performance additive(s). Refer to product data sheet.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact may cause mild eye irritation including stinging, watering, and redness. . This product produced minimal eye irritation in rabbits.

Skin Contact: Not known to be a skin irritant. No harmful effects from skin absorption are expected, however avoid frequent or prolonged contact.

Inhalation (Breathing): Expected to have a low degree of toxicity by inhalation.

Ingestion (Swallowing): This material may be harmful if ingesed. ASPIRATION HAZARD – This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs & Symptoms: Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, and fatigue), pulmonary edema (accumulation of fluids in the lungs) and pneumonitis (inflammation of the lungs).

Aggravated Medical Conditions: Conditions aggravated by exposure may include respiratory (asthma-like) disorders.

Developmental: No data.

Cancer: No specific data on this substance.

DELAYED OR OTHER HEALTH EFFECTS: Cancer: Prolonged or repeated exposure to exhaust gasses produced from engines burning this material may cause cancer. Whole diesel engine exhaust has been classified as a Group 2A carcinogen (probably carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Diesel exhaust particulate has been classified as reasonably anticipated to be a human carcinogen in the National Toxicology Program's Ninth Report on Carcinogens. The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel exhaust be regarded as potentially causing cancer. Diesel engine exhaust is known to the State of California to cause cancer. Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). See Section 11 for additional information. Risk depends on duration and level of exposure.

Target Organs: No data.

Other Comments: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as Solvent or Painters' Syndrome). Intentional misuse by deliberately concentrating and inhaling this material may be harmful or fatal.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: First aid is not normally required. However, it is good practice to wash any chemical from the skin.

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash Point (PMCC): 100-125°F (37.8-51.5°C)
OSHA Flammability Class: Combustible Class II Liquid
LEL (vol%):~0.6 UEL (vol%): ~4.7
Autoignition Temperature: ~257ºC(~494ºF)

Combustion Products: Carbon dioxide, carbon monoxide, water vapor.

Extinguishing Media: Dry chemical, carbon dioxide, or alcohol or polymer foam is recommended. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Special Fire Fighting Procedures & Precautions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Unusual Fire & Explosion Hazards: This material is combustible and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment). Heated liquid can release vapors that may readily form flammable mixtures at or above its flash point. If container is not properly cooled, it can rupture in the heat of a fire.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: OSHA Combustible. Keep all sources of ignition and hot surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8). Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material (e.g., sand or vermiculite). Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. **If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).**

7. HANDLING STORAGE

Handling: Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29 CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8). Wash thoroughly after handling. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practice.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury bunged, and promptly shipped to the supplier or a drum conditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA Regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame". Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Substance Name	**CAS No.**	Agency	Limits	Notes
Fuel, diesel, C_{8-28}-	437986-25-9	OSHA	PEL TWA 5	

alkane rich		mg/m^3
	ACGIH	TLV TWA 5 mg/m^3
	ACGIH	STEL 10 mg/m^3

Note: Country, state, local, or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Personal Protective Equipment (PPE) and Protective Measures

Respiratory Protection: A NIOSH certified air-purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air-supplied respirator if there is potential for uncontrolled release, exposure levels are not known or any other circumstances where air-purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Protective Clothing: Not required based on the hazards of the material. However, it is considered good practice to wear gloves when handling chemicals.

Eye/Face Protection: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Additional Protective Measures: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).
A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL & CHEMICAL PROPERTIES

Note: Unless otherwise indicated, values are determined at 68°F (20°C) and atmospheric pressure (760 mm Hg). Data is typical, individual samples may vary.

Flash Point (PMCC): 100-125°F (37.8-51.5°C)
Autoignition Temperature: no data
Appearance: Colorless *(may contain a dye)*
Physical State: Liquid
Odor: Odorless to mild paraffin
Vapor Pressure: <2 psi
Vapor Density (air = 1): >1
Viscosity at 40°C: 1.3 – 1.9 cSt
Approx. Boiling Range: 260-720°F (127-382°C)
Freezing Point: <32°F (<0°C)
Solubility in water: Insoluble
pH: not applicable
Density: 0.77 g/ml@15ºC

10. STABILITY & REACTIVITY

Chemical Stability: Stable under normal conditions of storage and handling. OSHA Combustible liquid. Vapor from heated liquid can cause a flash fire.

Conditions to Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

Incompatible Materials: Avoid contact with strong oxidizing agents.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

No definitive information available on carcinogenicity, mutagenicity, target organs or developmental toxicity. Diesel engine exhaust has been classified as a Group 2a Carcinogen (probably carcinogenic to humans) by IARC. See information in Section 3.

12. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, would be a RCRA "characteristic" hazardous waste due to the characteristic of ignitability (D001). If the material is spilled to soil or water, characteristic testing of the contaminated materials is recommended. Further, this material, once it becomes a waste, is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinse material could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

13. TRANSPORT INFORMATION	
	USA DOT
Shipping Name:	Flammable liquids, n.o.s. (Paraffins and Isoparaffins)
Hazard Class & Div.:	3
ID Number:	UN1993
Packing Group:	III
Label(s):	Flammable liquid
Placard(s):	Flammable liquid (3)
Notes:	

Notes:

1. Static Accumulator (50 picosiemens or less) unless performance additive has been added to mitigate static accumulation – consult appropriate product data sheet.

14. REGULATORY INFORMATION

This material is listed on the following country inventory lists: no data

TSCA – Exempted under CFR 720.30 and CFR 720.36

This material contains the following list of chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372: none known

This material contains the following list of chemicals subject to the reporting requirements of California Proposition 65: none known

NTP, IARC, or OSHA has not identified this material as a carcinogen. Diesel exhaust has been listed as a potential carcinogen.

EPA (CERCLA) reportable quantity: none known

For details on your regulatory requirements you should contact the appropriate agency in your state or country.

15. DOCUMENTARY INFORMATION

Current Issue Date: 15 Nov 2004 Previous Issue Date: 10 October 2004

16. DISCLAIMER OF EXPRESSED & IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. The product is the subject of continued further experimentation and testing. HOWEVER, NO WARRANTY OF MERCHANT LIABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his/her own determination as to the suitability of the product for his/her particular purpose and on the condition that he/she assume the risk of his/her use thereof.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **S-2 Synthetic Diesel Fuel**

Synonyms: Synthetic Diesel Fuel—Summer Grade, Synthetic Diesel Fuel—Winter Grade, Synthetic Diesel Fuel—Arctic Grade, GTL Diesel Fuel, FT Diesel Fuel, Syntroleum SD-2 Synthetic Distillate.

Product Code: not applicable

MSDS Code: not applicable

Chemical Family: Hydrocarbon

Responsible Party: Syntroleum® Corporation
4322 South 49th West Ave.
Tulsa, OK 74107

For product information contact Syntroleum® Corporation:
8am – 4pm, U.S. Central Time, Mon – Fri: 918-764-4358

EMERGENCY INFORMATION

24-Hour Emergency Telephone Number:

For Chemical Emergencies:
Spill, Leak, Fire or Accident
Call CHEMTREC
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

Health Hazards: Aspiration hazard if swallowed. Can enter lungs and cause damage. Avoid contact with eyes. Do not taste or swallow. Wash thoroughly after handling.

Physical Hazards: OSHA combustible liquid. Keep away from heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment).

Physical Form: Liquid
Appearance: Colorless *(may contain a dye)*
Odor: Odorless to mild paraffin

NFPA HAZARD CLASS: Health
0 = no special hazards Flammability
4 = maximum hazard class Reactivity

2. COMPOSITION / INFORMATION ON INGREDIENTS

#	Component	CAS No.	Approx. Wt%
1	Fuel, diesel, C_{8-28}-alkane rich and Methyl-branched alkane rich.	437986-25-9	100

Note 1: May contain up to 0.5 wt% performance additive(s). Refer to product data sheet.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

Eye Contact: Contact may cause mild eye irritation including stinging, watering, and redness.

Skin Contact: Not known to be a skin irritant. No harmful effects from skin absorption are expected.

Inhalation (Breathing): Expected to have a low degree of toxicity by inhalation.

Ingestion (Swallowing): This may be harmful if ingested. ASPIRATION HAZARD – This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

Signs & Symptoms: Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, transient excitation followed by signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, and fatigue), pulmonary edema (accumulation of fluids in the lungs) and pneumonitis (inflammation of the lungs).

Aggravated Medical Conditions: Conditions aggravated by exposure may include skin or respiratory (asthma-like) disorders.

Developmental: No data.

Cancer: No specific data on this substance.

DELAYED OR OTHER HEALTH EFFECTS: Cancer: Prolonged or repeated exposure to exhaust gasses produced from engines burning this material may cause cancer. Whole diesel engine exhaust has been classified as a Group 2A carcinogen (probably carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Diesel exhaust particulate has been classified as reasonably anticipated to be a human carcinogen in the National Toxicology Program's Ninth Report on Carcinogens. The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel exhaust be regarded as potentially causing cancer. Diesel engine exhaust is known to the State of California to cause cancer. Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). See Section 11 for additional information. Risk depends on duration and level of exposure.

Target Organs: No data.

Other Comments: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as Solvent or Painters' Syndrome). Intentional misuse by deliberately concentrating and inhaling this material may be harmful or fatal.

4. FIRST AID MEASURES

Eye: If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water. If symptoms persist, seek medical attention.

Skin: First aid is not normally required. However, it is good practice to wash any chemical from the skin. If Skin Irritation developes, wash with soap and water, and seek medical attention.

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from the source of exposure and into fresh air. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash Point (PMCC): 125-140°F (52-60°C)
OSHA Flammability Class: Combustible Liquid Class II
LEL (vol%): ~0.6 UEL (vol%): ~4.7
Autoignition Temperature: 257ºC (494ºF)

Combustion Products: Carbon dioxide, carbon monoxide, water vapor.

Extinguishing Media: Dry chemical, carbon dioxide, or alcohol or polymer foam is recommended. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Special Fire Fighting Procedures & Precautions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk.

Unusual Fire & Explosion Hazards: This material is combustible and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment). Heated liquid can release vapors that may readily form flammable mixtures at or above its flash point. If container is not properly cooled, it can rupture in the heat of a fire.

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Procedures: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8). Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Dike far ahead of spill for later recovery or disposal. Spilled material may be absorbed into an appropriate absorbent material (e.g., sand or vermiculite). Notify fire authorities and appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. **If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, notify the National Response Center (phone number 800-424-8802).**

7. HANDLING STORAGE

Handling: Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures such 29 CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8). Wash thoroughly after handling. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Use good personal hygiene practice.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury bunged, and promptly shipped to the supplier or a drum conditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA Regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

Storage: Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame". Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Substance Name	CAS No.	Agency	Limits	Notes
Fuel, diesel, C_{8-28}-alkane rich and Methyl-branched alkane rich.	437986-25-9	OSHA	PEL TWA 5 mg/m^3	
		ACGIH	TLV TWA 5 mg/m^3	
		ACGIH	STEL 10 mg/m^3	

Note: Country, state, local, or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Personal Protective Equipment (PPE) and Protective Measures

Respiratory Protection: A NIOSH certified air-purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air-supplied respirator if there is potential for uncontrolled release, exposure levels are not known or any other circumstances where air-purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Protective Clothing: Not required based on the hazards of the material. However, it is considered good practice to wear gloves when handling chemicals.

Eye/Face Protection: Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.

Additional Protective Measures: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).
A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL & CHEMICAL PROPERTIES

Note: Unless otherwise indicated, values are determined at 68°F (20°C) and atmospheric pressure (760 mm Hg). Data is typical, individual samples may vary.

Flash Point (PMCC): 125-140°F (51.5-60°C)
Autoignition Temperature: no data
Appearance: Colorless *(may contain a dye)*
Physical State: Liquid
Odor: Odorless to mild paraffin
Vapor Pressure: <2 psi @ 20ºC
Vapor Density (air = 1): >1
Viscosity at 40°C: 1.9-4.1 cP
Approx. Boiling Range: 320-720°F (160-382°C)
Freezing Point: <32°F (<0°C)
Solubility in water: Insoluble
pH: not applicable
Density: 0.77 g/ml@ 15ºC

10. STABILITY & REACTIVITY

Chemical Stability: Stable under normal conditions of storage and handling. Combustible liquid. Vapor from heated liquid can cause a flash fire.

Conditions to Avoid: Avoid all possible sources of ignition (see Sections 5 and 7).

Incompatible Materials: Avoid contact with strong oxidizing agents.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

No definitive information available on carcinogenicity, mutagenicity, target organs or developmental toxicity. Diesel engine exhaust has been classified as a Group 2a Carcinogen (probably carcinogenic to humans) by IARC. See information in Section 3.

12. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, would be a RCRA "characteristic" hazardous waste due to the characteristic of ignitability (D001). If the material is spilled to soil or water, characteristic testing of the contaminated materials is recommended. Further, this material, once it becomes a waste, is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinse material could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

13. TRANSPORT INFORMATION

	USA DOT	
Shipping Name:	Flammable Liquid, n.o.s. (Paraffins and isoparaffins)	
Hazard Class & Div.:	3 (Flammable Liquid)	
ID Number:	UN1993	
Packing Group:	III	
Label(s):	Not applicable	
Placard(s):	Flammable	
Notes:	1	

1.	Static Accumulator (50 picosiemens or less) unless performance additive has been added to mitigate static accumulation – consult appropriate product data sheet.

14. REGULATORY INFORMATION

This material is listed on the following country inventory lists: no data

This material contains the following list of chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372: none known

This material contains the following list of chemicals subject to the reporting requirements of California Proposition 65: none known

NTP, IARC, or OSHA has not identified this material as a carcinogen. Diesel exhaust has been listed as a potential carcinogen.

EPA (CERCLA) reportable quantity: none known

For details on your regulatory requirements you should contact the appropriate agency in your state or country.

15. DOCUMENTARY INFORMATION

Current Issue Date: 12 Nov 2004 Previous Issue Date: 30 Aug 2003

16. DISCLAIMER OF EXPRESSED & IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. The product is the subject of continued further experimentation and testing. HOWEVER, NO WARRANTY OF MERCHANT LIABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his/her own determination as to the suitability of the product for his/her particular purpose and on the condition that he/she assume the risk of his/her use thereof.

41-020
Revision
Number: 8

Shell Canada Limited

Material Safety Data Sheet

Effective Date: 2002-08-14
Supersedes: 2001-01-08

Class B2 Flammable Class D2B Other Toxic Class D2A Other Toxic Liquid Effects - Skin Irritant Effects - Carcinogen

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: **SHELL JET B WITH ANTI-ICING ADDITIVE** SYNONYMS: WIDE BOILING RANGE AVIATION TURBINE FUEL PLUS ANTI ICING ADDITIVE

PRODUCT USE: Fuel
MSDS Number: 141-020

MANUFACTURER	**TELEPHONE NUMBERS**	
Shell Canada Limited	**Shell Emergency Number**	1-800-661-7378
P.O. Box 100, Station M	**CANUTEC 24 HOUR EMERGENCY NUMBER**	613-996-6666
400-4th Ave. S.W.		
Calgary, AB Canada	For general information:	1-800-661-1600
T2P 2H5	For MSDS information:	403-691-3982
	(From 7:30 to 4:30 Mountain Time)	403-691-2220

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.

*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	**CAS Number**	**% Range**	**WHMIS Controlled**
Naphtha (Petroleum), Full-range Reformed	68919-37-9	>95	Yes
Benzene	71-43-2	0.5 - 1.5	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Bright Clear Typical Gasoline Odour

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Routes of Exposure:	Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.
Hazards:	Flammable Liquid. Irritating to skin. Contains Benzene. May cause cancer. Vapours are moderately irritating to the eyes. Vapours are moderately irritating to the respiratory passages. The liquid when accidently aspirated into the lungs can cause a severe inflammation of the lung. Excessive exposure to benzene may cause leukemia in man.
Handling:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Avoid prolonged exposure to vapours. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames. For further information on health effects, see Section 11.

4. FIRST AID

Eyes:	Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.
Skin:	Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.
Ingestion:	DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs.
Inhalation:	Remove victim from further exposure and restore breathing, if required. Obtain medical attention.
Notes to Physician:	The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical Carbon Dioxide Foam Water Fog

1
4
1
-
0
2
0

Revision Number: 8

Firefighting Instructions: Extremely flammable. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Flashback may occur along vapour trail. Do not use water except as a fog. Use water to cool fire exposed containers. Product will float and can be reignited on surface of water. Containers exposed to intense heat from fires should be cooled with water to prevent vapour pressure buildup which could result in container rupture. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus. Always stay away from ends of containers due to explosive potential. Fight fire from maximum distance.

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

6. ACCIDENTAL RELEASE MEASURES

Issue warning "Flammable". Eliminate all ignition sources. Handling equipment must be grounded. Isolate hazard area and restrict access. Try to work upwind of spill. Avoid direct contact with material. Saturated clothing should be immediately removed to avoid flammability hazard. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. For large spills remove by mechanical means and place in containers. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand . Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

7. HANDLING AND STORAGE

Handling: Extremely flammable. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will

settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Never siphon by mouth. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Use explosion-proof ventilation to prevent vapour accumulation. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE CONDITIONS OF USE.

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

North American exposure limits have not been established for the product.
Consult local authorities for
acceptable provincial values.
Recommend SHELL guideline of 125 mg/m3 for vapours (8 hour shift).
Gasoline: 300 ppm (STEL: 500 ppm)
Benzene (skin) : 0.5 ppm (STEL: 2.5 ppm)

Mechanical Use explosion-proof ventilation as required to control vapour concentrations.

Ventilation: Concentrations in air should be maintained below lower explosive limit at all times or below the recommended threshold limit value if unprotected personnel are involved. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

PERSONAL PROTECTIVE EQUIPMENT:

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

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

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

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Bright Clear
Odour:	Typical Gasoline Odour
Odour Threshold:	Not available
Freezing/Pour Point:	<-51 degrees C
Boiling Point:	60 - 260 degrees C
Density:	750 - 801 kg/m3 @ 15 degrees C
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	>42 mm Hg @ 38 degrees C
pH:	Not applicable
Flash Point:	Method Tag Closed Cup <1 degrees C
Lower Explosion Limit:	1 % (vol.)
Upper Explosion Limit:	7 % (vol.)
Autoignition Temperature:	Not available
Viscosity:	Not available

Evaporation Rate (n-BuAc = 1): Not available **Partition Coefficient (K_{ow}):** Not available **Water Solubility:** Insoluble

 Other Solvents: Hydrocarbon Solvents

10. STABILITY AND REACTIVITY

Chemically Stable:
Hazardous Polymerization:
Sensitive to Mechanical Impact:
Sensitive to Static Discharge:
Hazardous Decomposition Products:
Incompatible Materials:
Conditions of Reactivity:

YesNoNoYesThermal decomposition products are highly dependent on combustion conditions.Avoid contact with strong oxidizing agents and acids.Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
Naphtha (Petroleum), Full-range Reformed	LD50 Oral Rat >28 mL/kg
Benzene	LD50 Oral Rat = 930 - 5600 mg/kg LC50 Inhalation Rat = 13700 ppm for 4 hours

Routes of Exposure: Exposure may occur via inhalation, ingestion, skin absorption and skin or eye contact.

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

Chronic Effects: Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression. Prolonged and repeated exposure may cause serious injury to blood forming organs, resulting in anemia and similar conditions.

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

Carcinogenicity and Mutagenicity: This product contains benzene. Epidemiological studies indicate that long term inhalation of benzene vapour can cause leukaemia in man. Benzene has also produced chromosomal aberrations in peripheral blood lymphocytes. Carcinogenic hazard.

12. ECOLOGICAL INFORMATION

Environmental Effects:

Biodegradability:

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May be harmful to aquatic life. May cause physical fouling of aquatic organisms. Not readily biodegradable. Potential for bioaccumulation.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1863
Proper Shipping Name	FUEL, AVIATION, TURBINE ENGINE
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG II
Shipping Description	FUEL, AVIATION, TURBINE ENGINE Class 3 UN1863 PG II

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B2 Flammable Liquid Class D2B Other Toxic Effects - Skin Irritant Class D2A Other Toxic Effects - Carcinogen
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.
Other Regulatory Status:	No Canadian federal standards.

16. ADDITIONAL INFORMATION

LABEL STATEMENTS

Hazard Statement :	Flammable Liquid. Irritating to skin. Contains Benzene. May cause cancer.
Handling Statement:	Eliminate all ignition sources. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Avoid prolonged exposure to vapours. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and

open flames.

First Aid Statement : Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.

Revisions: This MSDS has been reviewed and updated.
Changes have been made to:

Section 14

APPENDIX B – NWT SPILL REPORT FORM

NWT SPILL REPORT (Oil, Gas, Hazardous chemicals or other materials)

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

A Report Date and Time	B Date and Time of Spill (if known)	C ☐ Original Report ☐ Update No.	Spill Number
D Location and map coordinates (if known) and direction (if moving)			
E Party Responsible for Spill			
F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)			
G Cause of spill			
H Is spill terminated? ☐ yes ☐ no	I If spill is continuing give estimated rate	J Is further spill possible? ☐ yes ☐ no	K extent of contaminated area in m^2
L Factors affecting spill or recovery (weather conditions, terrain snow cover etc).		M Containment (natural depression, dyke etc)	
N Action, if any, taken or proposed to contain , recover, clean up or dispose of product(s) and contaminated materials			
O Do you require assistance? ☐ no ☐ yes	P Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife.		

Q Comments and/or recommendations	FOR SPILL LINE USE ONLY
	Lead Agency
	Spill Significance
	Lead Agency contact and time
	Is this file now closed? ☐ yes ☐ no

Reported by:	Position, Employer, Location	Telephone No:
Reported to:	Position, Employer, Location	Telephone No:

APPENDIX C – How To Activate the Spill Contingency Plan

HOW TO ACTIVATE THE SPILL CONTINGENCY PLAN

In the event of any leak, spill or system failure, steps taken by company personnel at the spill site are as follows:

- Be alert, ensure your safety and the safety of others first;
- Assess the hazard to persons in the vicinity of the spill or leak;
- Assess nature and status of the spill, leak or system failure and measures to be taken to bring the situation under control;
- When safe to do so, stop the flow of the spilled material;
- Report the spill, leak of container, immediately to the On-Scene Coordinator so that person can ensure that the responsible regulator is notified by contacting the NWT 24-Hour Spill Line at (867) 920-8130 or fax (867) 873-6924 and DIAND Water Resources Inspector at (867)975-4298;
- Resume safe, effective actions to contain, stop the flow of spilled product or clean up the incident; and
- Record all information on the status of the situation. Take photographs of the site (if possible) before the clean up and after the clean up has been completed.

ACTION PLAN FOR SPILL OF DIESEL FUEL

Initial Spill Responses:

- STOP the flow if possible;
- CONTAIN flow of oil by dyking, barricading or blocking flow by any means available. Use earth moving equipment if practical;
- ELIMINATE, open flame ignition sources;
- If flow has reached any natural stream, mobilize team to deploy river boom, and sorbent booms; and
- If possible, pump fuel into other appropriate tankage/containers.

Hazards:

- Flammable
- Slightly toxic by ingestion, highly toxic if aspired

Action for Fire:

- Use carbon dioxide, dry chemical, foam, or water spray (fog), although water may spread the fire;
- Use fog streams to protect rescue teams and trapped people;
- Use water to cool surface of tanks;
- Divert the diesel fuel to an open area and let it burn off under controlled conditions;
- If the fire is put out before all diesel is consumed, beware of re-ignition;
- Where diesel fuel is running downhill, try to contain it as quickly as possible; and
- Rubber tires are almost impossible to extinguish, have affected vehicles removed from the danger zone.

Recovery:

- Unburned diesel fuel can be soaked up by sand and peat moss, of by chemical sorbents such as Grabil or Conwed;
- If practical, contaminated soil should be excavated;
- Diesel fuel entering the ground should be recovered by digging sumps or trenches; and
- Diesel fuel on a water surface should be recovered by skimmers or sorbent booms. (See Section on Recovery of Oil Spills)

Disposal:

- Incineration under controlled conditions; and
- Burial at an approved site.

Properties:

- Chemical composition mixture of hydrocarbons in the range C9 to C18;
- Clear, oily liquid; and
- Not soluble, floats on water

Environmental Threat:

- Moderately toxic to fish and other aquatic organisms;
- Harmful to waterfowl; and
- May create visual film on water and shorelines.

Containers:

- Transported by appropriate methods to acceptable storage, (typically 205 litre drums); and
- Bulk transportation and storage.

ACTION PLAN FOR ETHYLENE GLYCOL (ANTIFREEZE) SPILL

Initial Spill response:

- STOP the flow at source if possible;
- ELIMINATE open flame ignition sources;
- CONTAIN flow of liquid by dyking, barricading or blocking flow by any means available; and
- PREVENT antifreeze from entering any flowing streams

Hazards:

- Moderately toxic by ingestion and inhalation; and
- Flammable.

Action for Fire:

- Use carbon dioxide, dry chemical, foam or water spray (fog);

Recovery:

- Ethylene glycol antifreeze can be soaked up by peat moss or by commercial sorbents such as Hazorb; and
- Access to spilled or recovered ethylene glycol by mammals should be prevented.

Disposal:

- Incineration under controlled conditions; and
- Burial at an approved site.