Spill Response Plan

Onsite Environment Manager: Barry Hanslit

Sat phone: 011 8816 6299 2586

Quick Action Spill Response Plan

Actions to take if you have a spill:

1) **What has spilled?** - *Identify the product* - check container design, warning labels, markings, etc.
2) **Protect yourself and others** - *Put on safety gear, notify Barry and warn others* – Put on gloves, eye protection or coveralls as appropriate and if necessary. Notify Barry he will help secure the scene. Make sure no one approaches the site and that they stay far enough away to be safe in case of a fire or explosion
3) **Minimize the damage** – *Try to stop the flow at the source* – Stop or reduce the flow of the spill. Put a leaky drum on its end or put a leaking container in an empty drum or heavy duty garbage bag.
4) **Clean-up the spill** – *Use the spill kits* – Items in the spill kits will help you mop up, contain or eliminate the spill. Don't be shy use whatever materials will help remediate the situation. See the clean-up section of this plan for more ideas.
5) **Report the spill** – *Fill out the paperwork* – The NU/NWT Spill Report form is at the end of this plan. You will need to know the location of spill, name of product spilled, type and amount of material spilled, date and time of the spill and any perceived threat to human health or the environment.

24-Hour Spill Report Line (867) 920-8130 or fax (867) 920-8127
DIAND Water Resources Inspector (867) 979-4405

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1. Introduction

This spill plan has been prepared for the proposed exploration on the Fork Property located near the Tree River in. This plan will show that Barry Hanslit is prepared to respond to any potential spills during the course of the exploration. The format and a great deal of information was gathered from "Guidelines for Spill Contingency Planning", Prepared by Water Resources Division Indian and Northern Affairs Canada Yellowknife, NT April 2007, which is an excellent resource and will be included in the on-site permit binder for reference purposes.

2. Company and Contact Details

Barry Hanslit – Owner/Operator
3380 Hammond Bay Road
Nanaimo, BC, V9T 1E6
Home: (250) 716-6647
Work: (250) 722-2340
Email: hanslitb@telus.net
Camp Sat phone: To be determined

Alternate emergency contact:
Janet Miller: (250) 739-1511
Email: heyoutthereca@yahoo.ca

3. Plan Details

3.1 Important Dates:

Effective Date of Spill Plan: July 15, 2008
Last Revisions to the Spill Plan: June 29, 2008
(Revamping format and updating details)

3.2 Distribution List:

B. Hanslit	Head of program-Owner/Operator
P. Kusugak	INAC - Manager
P. Beaulieu	NWB
L. Wan	NIRB
M. Joy	Water Resources Officer
B. Pederson	Resource Management Officer

4. Project Description

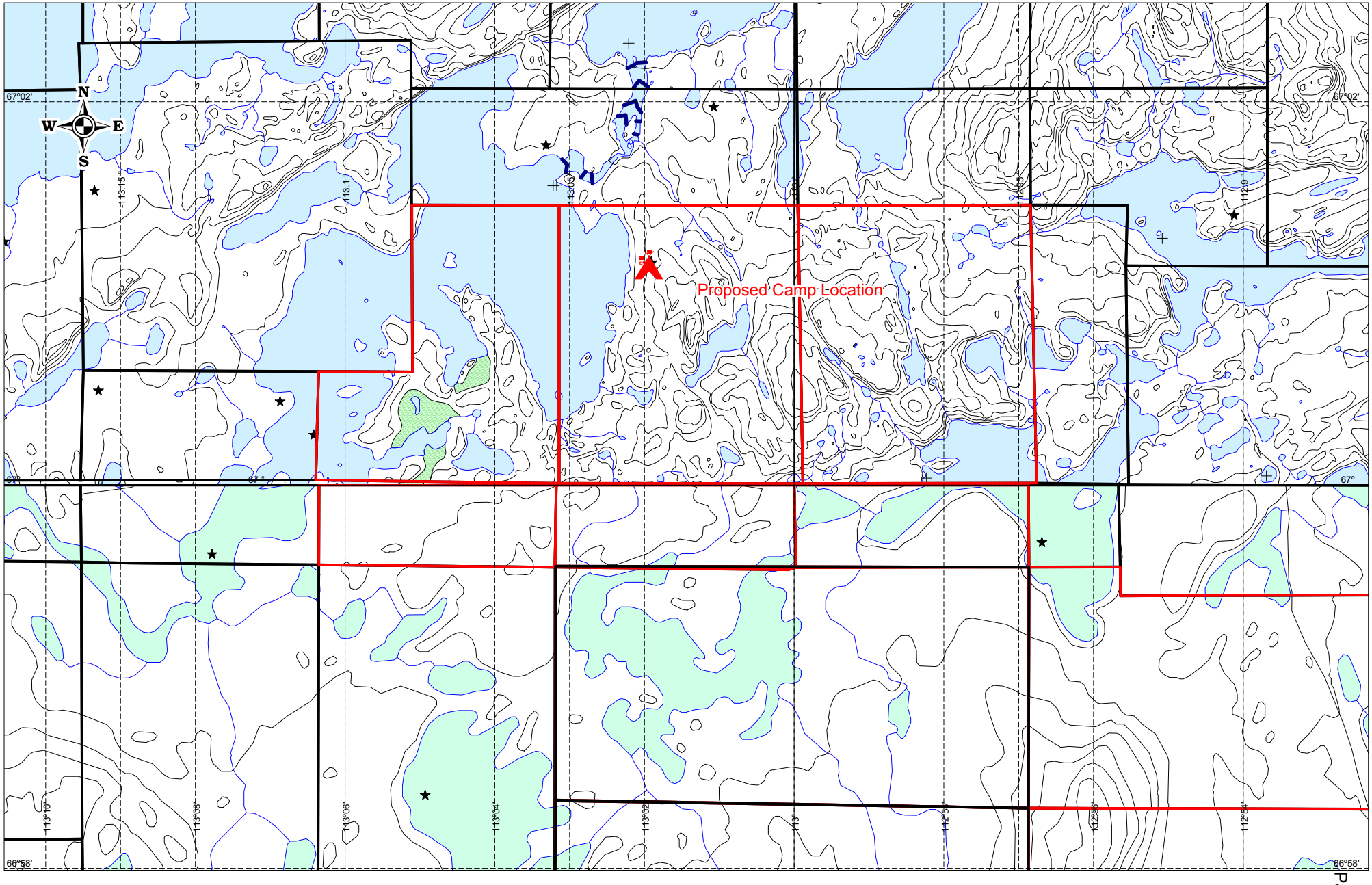
This project is a grass-roots diamond exploration to be performed by a small group of 3-4 persons in a fly camp this summer. The main portion of the project will be prospecting, traversing the ground looking for indicators of kimberlite, and ground geophysical surveys which is traversing the ground with a magnetometer that measures the magnetic signal of the ground below. This property is being explored by a single individual prospector so will be low key and low impact to maximize the amount of exploration that will happen for a minimum of time and money.

5. Site Plan

The proposed camp location is located near the Tree River in the Kitikmeot Region, 130km southeast of Kugluktuk and 217 km NNW of Bathhurst Inlet at roughly

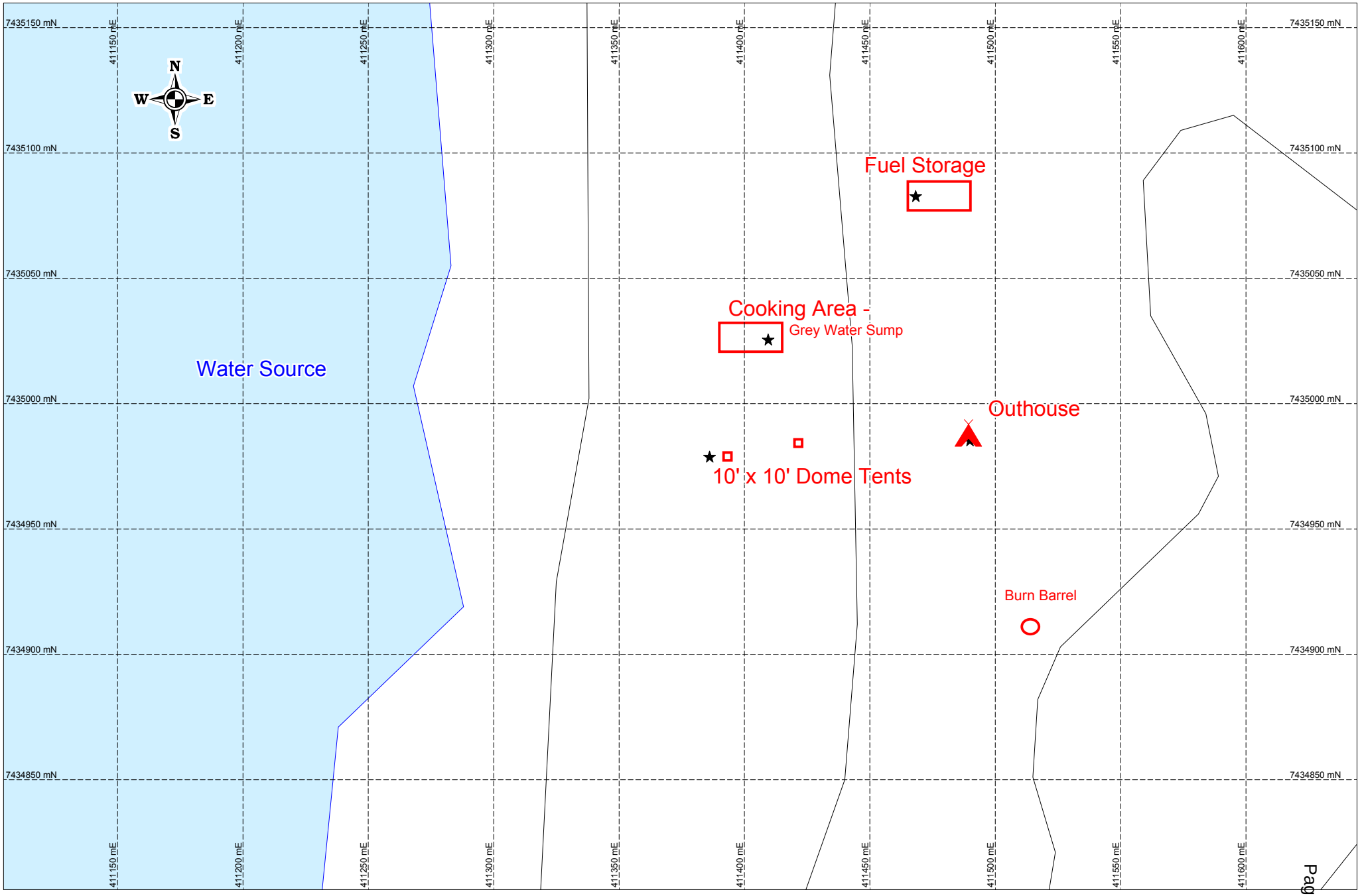
Lat/Long WGS 84: -113˚ 1’ 56”W, 67˚ 1’ 9” N

There are no adjacent communities or inhabitants, thus the only persons affected by potential spills are employees and contractors. The nearest possible emergency contact is the Knife Lake Camp operated by DeBeers. The nearest community is Kugluktuk, but all supplies will be routed through Yellowknife and waste disposal will take place in Yellowknife as well. The following Figure 1 shows the property location at 1:50,000 scale. Figure 2 shows a proposed layout for the camp including tents, water bodies, fuel and spill kit locations.



Project Mineral Claims

Figure 1: Project Area - Barry Hanslit Permit Application 2008
Scale: 1:50,000 Lat/Long WGS 84



★ Spill Kit Locations

Figure 2: Camp Area - Barry Hanslit Permit Application 2008
Scale: 1:200 UTM-NAD83 Zone 12

6. Hazardous Materials On-Site

There will eventually be two fuel storage sites, at some point in the future when/if drilling commences, the camp and the drill. However, during this year's program all the fuel will be stored at camp. Fuel for the program includes diesel and propane. MSDS sheets for these products can be found in Appendix I. Below is a table showing fuel amounts and locations.

Material	Storage Container	Normally On-Site	Maximum On-Site	Storage Location and Uses
Diesel	205 L (45 gal) Steel drums	1 drum	9 drums (1,845 L)	In the Fuel Storage area. Used to heat tents, power generator (possible) and run the drill.
Propane	100 lb cylinder	1 cylinder	3 cylinders	In fuel storage. Used for cooking.

Fuel Storage Area - The fuel storage area as shown in Figure 2 will be located a safe distance from the accommodations and located at a distance of over 100m from the ordinary high water mark of any adjacent water body, preferably in an area of low permeability, and inspected on a regular basis. A hand transfer pump and an empty drum shall be maintained in this area at all times along with a spill kit and a large roll of absorbent matting. The fuel storage area will be equipped with a liner to protect the underlying land and help ensure containment in the event of a spill.

In-use Fuel – Fuel that is in-use shall have all connections tight and wrapped with absorbent matting secured with zap-straps. Drip trays or buckets will be placed beneath the wrapped spigots to ensure that there are no leaks onto the tundra.

7. Preventative Measures and Maintenance

The most likely spill situation is not catastrophic but one of the many minor leaks that could be prevented by a vigilant maintenance and inspection regime.

Upon arrival in camp at the beginning of the program one person will be delegated to be in-charge of fuel inspections. This requires a daily monitoring of every fuel drum and container. This involves checking each drum for signs of leaking such as staining or discoloration of surrounding soils, rusting on the drum seals, a glistening appearance on any drum, moisture on any wrapped connection, smell of hydrocarbons, etc. The results of this daily monitoring will be recorded. Propane should be checked by spraying soapy water in a squirt gun on the connections and check for bubbles indicating a leak. Transfer all fuel using the hand pump from any drum that leaks or looks like it will leak to an available empty drum.

In addition to checking fuel daily drums need to be inspected when they arrive in camp, after moving them to any new location. Store drums upright with the bungs on top and if you are on any sort of gradual slope, rotate the bungs uphill to help keep water out of the fuel. The optimal location for fuel is on flat stable (sandy not clay rich soil) terrain in a natural depression situated more than 30m from the high water mark on any surrounding water bodies. Store propane tanks upright and secured to a stable object to ensure they do not fall over.

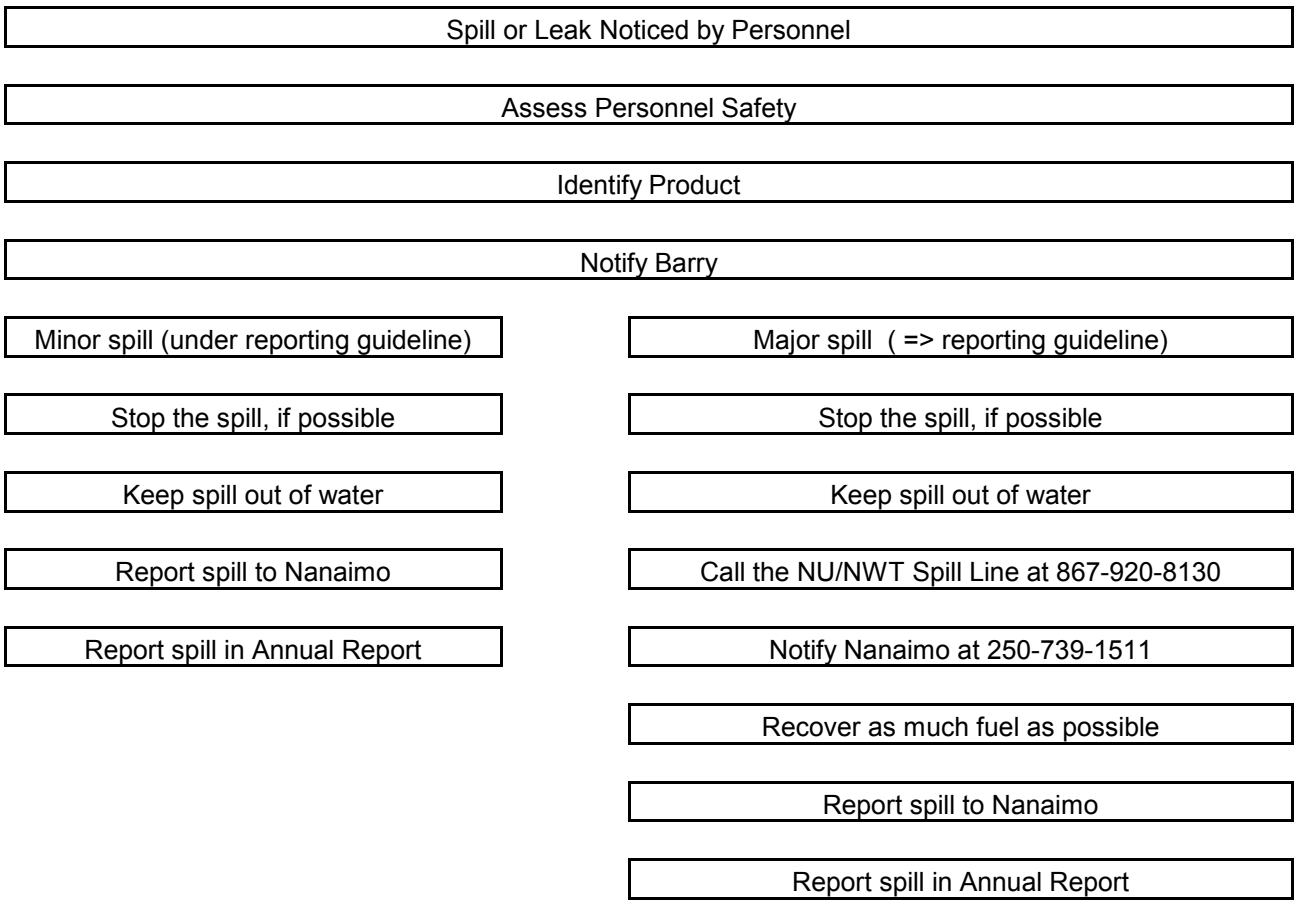
As mentioned above diesel fuel in use for heating or for the generator needs to be additionally guarded against spills. All connections need to be wrapped in absorbent matting and secured with zap-straps, drip pans or buckets placed beneath these connections as additional safety. Drip trays and matting need to be used whenever fuel is transferred using a hand wobble-pump.

8. Response Organization

The response chart shown on the following page shows who to contact in the case of an emergency. The camp satellite phone is located in the cooking area for required communications.

Any spill that is an immediate environmental or human health hazard or is equal to or greater than the volumes outlined in Appendix III, must be reported to the NWT 24-Hour Spill Report Line at 867-920-8130. Any spills less than these quantities do not need to be reported immediately to the spill reporting line, but do need to be recorded for the annual reports or if requested. When in doubt, report the spill to the NU/NWT 24-Hour Spill Report Line.

If the spill is dangerous to personnel, use the satellite phone to contact emergency response personnel in Yellowknife. After reporting the spill to Barry Hanslit, he will report spills to the NWT 24-Hour Spill Line as necessary. Barry will also contact Nanaimo to help keep a record of the spill. Nanaimo can be reached at (250) 722-2340 and 24-hours at (250) 739-1511.



9. Action Plan

9.1 Potential spill sizes and sources for each hazardous material on-site

In the following table is a list of types on fuel on-site, possible types and sources of discharge. The detailed spill plan will address spills of this magnitude, a worst case scenario is also presents. No specific discharge rates are presents as they are highly variable based on the type of spill. Note the worst case scenario is in italics.

Type of Fuel	**Type of Discharge**	**Discharge volume**	**Direction of Potential Discharge**
Diesel Fuel (oil stoves, drill, generator)	1 – Leaking from in-use drum connections 2 – Minor leak in drum in/out of fuel storage area 3 – Large puncture in fuel drum	Likely 5-10 L, up to 205L (one full drum)	From camp area, towards stream. From fuel storage on flat ground, no direction.

	in/out of fuel storage area 4 – Overfilling drilling equipment *5 – All drums catastrophically punctured and leaking at once.*	*1845 L-all nine (9) drums*	
Propane (kitchen stove)	1 – Improperly fitted connection 2 – Minorly leaking cylinder in/out of fuel storage area 3 – Large puncture, fast leaking drum in/out of storage area *4 – All cylinders catastrophically punctured and leaking at the same time*	Likely 10-20 lbs up to 100 lbs (one full cylinder) *All three(3) cylinders leaking at once*	In camp on flat ground, but since it is airborne no likelihood of water contamination

9.2 Potential environmental impacts of the spill including worst case scenario

Overall for all hazardous materials discussed below, impacts are lower during winter as snow is a natural sorbent and ice forms a barrier limiting or eliminating soil or water contamination, thus spills can be more readily recovered when identified and reported.

Diesel Fuel

Environmental impacts: Diesel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Diesel burns slowly and thus risk to the environment is reduced during recovery as burn can be more readily contained compared with volatile fuels. Runoff into water bodies must be avoided.

Worst case scenario: All fuel drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

Propane

Environmental impacts: Propane may be harmful to wildlife and the surrounding environment. It has the potential to accumulate in the environment. Propane is extremely volatile and is the most flammable material stored on site, thus immediate impacts to the surrounding environment are a concern.

Worst case scenario: All cylinders were punctured or failed simultaneously and contents leaked into the surrounding environment and ignited leading to an explosion. This could cause serious environmental impacts in the immediate surroundings. Safety during emergency response to a propane spill is of the utmost concern.

9.3 Procedures

9.3a Procedures for Initial Action

1 – Ensure safety of all personnel
2 – Assess spill (type, hazards and risks)
3 – Remove sources of ignitions
4 – Stop the spill if possible – shut off the spigot, rotate the bung upright, tip the drum upright or away from the spill, tighten bungs or stoppers. If you are going to contact the fuel put on the gloves available in the spill kits.
5 – Contact Barry regardless of the size of the spill
6 – Contain the spill – Use the sorbent materials in the spill kit or use a shovel to make a dyke. More containment methods are shown in the following section for Specific Spill Containment Methods for land, water, ice and snow.

9.3b Spill Reporting Procedures

All spills must be reported to Barry. There are multiple copies of the Spill Report form in the kitchen in the permits binder. Fill this form out, even for spills that are below the threshold level for reporting. In general you will need to know the location of spill, name of product spilled, type and amount of material spilled, date and time of the spill and any perceived threat to human health or the environment. Fax or email the form to the NU/NWT 24-Hour spill line if appropriate, and send a copy to Nanaimo.

NU/NWT 24-Hour Spill Line
Phone: (867) 920-8130
Fax: (867) 873-6924

Nanaimo Contact (Janet)
Phone: (250) 722-2340
Cell: (250)739-1511
Fax: (250) 729-0381

9.3c Procedures for containing and controlling the spill (e.g. on land, water, snow. etc.)

1 – What will be affected by the spill.
2 – Determine the speed and direction of spill and cause of movement (water, wind and slope).
3 – Find the best location for containing spill, and to avoid any water bodies.
4 – Be prepared in case the spill worsens beyond control or if the weather or topography impedes containment.

9.3d Specific Spill Containment Methods for land, water, ice and snow

Land Spills:

Spills on land include spills on rock, gravel, soil and/or vegetation. It is important to note that soil is a natural sorbent, thus spills on soil are generally less serious then spills on water as contaminated soil can be more easily recovered. Generally spills on land occur during the late spring, summer or fall when snow cover is at a minimum. It is important that all measures be undertaken to avoid spills reaching open water bodies.

Dykes or Earth Dams

Dykes can be created using a shovel to mound up soil surrounding a spill on land. These dykes are constructed around the perimeter or down slope of the spilled fuel. A dyke needs to be built up high enough to contain all the spill that might reach it. A plastic tarp can be placed on and at the base of the dyke, so that fuel can pool and then can be removed with sorbent materials (from the spill kit, or absorbent matting) or by pump into barrels or bags. If the spill is migrating very slowly, a dyke may not be necessary and sorbents can be used to soak up fuels before they migrate away from the source of the spill. In the case of a smaller spill, you can use the absorbent booms in the spill kit as dykes to contain the spill.

Trenches

Trenches can be dug out to contain spills as long as the top layer of soil is thawed. Shovels or pick axes can be used depending on the size of trench required, dig down to permafrost or bedrock, so that it will provide a containment layer for the spilled fuel. Fuel can then be recovered using a pump or sorbent materials.

Space spraying or 'herding'

This technique can be used for cleaning vegetation, shorelines, lake surfaces, etc. You use a very fine spray of water to "herd" the fuel into absorbent materials, which suck up the fuel and leave the water.

Water Spills

Spills on water such as rivers, streams or lakes are the most serious types of spills as they can negatively impact water quality and aquatic life. All measures need to be undertaken to contain spills on open water.

Booms

Booms are commonly used to recover fuel floating on the surface of lakes or slow moving streams. Small booms can be found in the spill kits. They are released from the shore of a water body to create a circle around the spill. If the spill is away from the shoreline a boat will need to be used to reach the spill, then the boom can be set out. More then one boom may be used at once. Booms may also be used in streams and should be set out at an angle to the current. Booms are designed to float and have sorbent materials built into them to absorb fuels at the edge of the boom. Fuel contained within

the circle of the boom will need to be recovered using sorbent materials or pumps and placed into barrels or bags for disposal.

Weirs or Underflow Dams

Weirs can be used to contain spills in streams and to prevent further migration downstream. Plywood or other materials found on site can be placed into and across the width of the stream, such that water can still flow under the weir. Spilled fuel will float on the water surface and be contained at the foot of the weir. It can then be removed using sorbents, booms or pumps and placed into barrels or plastic bags.

Barriers

In some situations barriers made of netting or fence material can be installed across a stream, and sorbent materials placed at the base to absorb spilled fuel. In this camp situation think of bug netting as that is readily available. Sorbents will need to be replaced as soon as they are saturated. Water will be allowed to flow through. This is very similar to the weir option discussed above. Note that in some cases, it may be appropriate to burn fuel or to let volatile fuels such as gasoline evaporate after containment on the water surface. This should only be undertaken in consultation with,
and after approval from the INAC or lead agency Inspector.

Ice Spills

Spills on ice are generally the easiest spills to contain due to the predominantly impermeable nature of the ice. For small spills, sorbent materials are used to soak up spilled fuel. Remaining contaminated ice/ slush can be scraped and shoveled into a plastic bag or barrel. Make sure spills do not enter ice covered waters as no easy method exists for containment and recovery of spills if they seep under ice. You would need to return to the site just as it is breaking up and treat the spill aggressively as a water spill – see the above techniques.

Dykes and Trenches

Both techniques are useful and have been described above.

Burning

Burning should only be considered if other approaches are not feasible, and is only to be undertaken with the permission of the INAC or lead agency Inspector.

Snow Spills

Snow is a natural sorbent, thus as with spills on soil, spilled fuel can be more easily recovered. Small spills on snow can be easily cleaned up by raking and shoveling the contaminated snow into plastic bags or empty barrels, and backhauling these to Yellowknife for disposal.

Dykes

Dykes can be used to contain fuel spills on snow. By compacting snow down slope from the spill, and mounding it to form a dyke, a barrier or berm is created to help contain the spill. If the quantity of spill is fairly large, a plastic tarp can be placed over the dyke such that the spill pools at the base of the dyke. The collected fuel/snow mixture can then be shovelled into barrels or bags, or collected with sorbent materials.

Worst Case Scenarios

Dealing with spilled fuel that overflows the first containment method (dyke or trench) would present a possible worst case scenario. Further trenches or dykes would need to be created rapidly downstream of the spill to contain the overflow.

9.4 Procedures for transferring, storing, and managing spill related wastes

For most spills, you begin by containing the spill then you clean it moving from the perimeter to the center of the spill. Sorbent socks, matting and pads are generally used for small spill clean up. The wobble pump can suction spills from leaking containers or large accumulations on land or ice, and pump them into empty drums. Hand tools such as cans, shovels, and rakes are also very effective for small spills or hard to reach areas. All absorbent materials used to clean up a spill, should be double bagged (secure bags independently) for future disposal. All absorbent materials mentioned in this section are available in the spill kits located in camp, shovels and hand tools will be located near the kitchen area. Following clean up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible. In most cases the spilled petroleum products and materials used for containment will be double bagged and placed into empty sample buckets and sealed for proper disposal at an approved disposal facility.

10. Resource Inventory

10.1 On-site resources

Spill kits are located at camp as shown in Figure 2. The contents are described below. In addition, hand tools and other equipment available for use are listed below.

Spill Kit Contents
Nitrile gloves
Goggles
2 – 18” x 18” pillows
3 – SOCs, 3” x 12 ft
12 – pads 15” x 19”
3 heavy duty disposable bags.
1 large tarp
1 roll duct tape

Hand Tools and Other
1 wobble pump for fuel transfer
3 shovels
2 pick-axes
tool kit including hack saw, hammer, knives, screwdrivers, etc.

10.2 Off-site resources

All the contacts listed below could reach the site realistically in 4 hours (roughly a 2 hour flight time from Yellowknife by Baby Caravan). Likely all government officials would not be able to reach the site until the next business day, depending on the severity of the spill.

Nanaimo, 24-hour emergency line (Janet)
(250) 739-1511

NU/NWT 24-Hour spill line
(867) 920-8130

Environment Canada (Emergency) Yellowknife
(867) 669-4725

GoNU Environmental Protection Division
(867) 975-5900

GoNU Department of Environment
(867) 975-7700 or toll free 1(866) 222-9063

RCMP (Yellowknife)
(867) 669-1111

Medivac (Yellowknife)
(867) 669-4115

Air Tindi (Yellowknife)
(867) 669-8218 or 669-8200

Arctic Sunwest (Yellowknife)
(867) 873-4464

Manager of Field Operations, INAC Nunavut Regional Office
Peter Kusugak, Manager
Tel: (867) 975-4295
Fax: (867) 979-6445

Email: KusugakP@inac-ainc.gc.ca

Melissa Joy, Water Resources Officer
Tel: (867) 982-4302
Fax: (867) 982-4307
Email: JoyM@inac-ainc.gc.ca

Baba Pederson, Resource Management Officer
Tel: (867) 982-4306
Fax: (867) 982-4307
Email: PedersonB@inac-ainc.gc.ca

11. Training Program

11.1 Outline of training program

The employee and contractor training program will be quite simple as there will only be 3-4 persons on-site and they will all mobilize and set-up camp together. Time on the site is also limited (less than a week), so bearing this in mind upon completion of camp set-up the employee will be given a training and orientation session by Barry Hanslit. This will include:

1 – A quick tour of the camp, noting important features such as locations of safety equipment and spill kits
2 – Discussion of specific areas of concern, such as the fuel storage area and in-use drum connections with a focus on what things should look like and what indicates a problem.
3 – Detailed orientation as to the contents and appropriate use of the spill kit materials.
4 – A run-through of this spill plan, including a briefing on the MSDS sheets for the hazardous material on-site.

11.2 Training schedule and recordkeeping

Barry will keep a record indicating the training undertaken, and the expiration dates of specific training e.g. first aid. It is regularly updated.

Prepared January 23, 2008
revised July 2, 2008

References:

Guidelines for Spill Contingency Planning, Prepared by Water Resources Division Indian and Northern Affairs Canada Yellowknife, NT April 2007. 30 pages.

Contingency Planning and Spill Reporting in the NWT - A guide to the new regulations, GNWT, 8pp.

Oil Spill Containment and Clean up Techniques - 22 minute instructional video prepared by NWT Renewable Resources Pollution Control Division, 1988.

Report All Spills - Environment Series, GNWT Renewable Resources, Pollution Control Division, 1988.

Spill Containment and Clean-up Course, GNWT Renewable Resources, Pollution Control Division, 1991, 74pp.

Spill Contingency Planning and Reporting Regulations - Environmental Protection Act - Northwest Territories, July 22, 1993, 11pp.

Spills, Our Record in the Northwest Territories - Environment Series, GNWT Renewable Resources, Culture and Communications, 1990

Hazardous Substance Coordinator
Environmental Protection Division
Renewable Resources
Government of the NWT
600, 5102-50th Ave. telephone: (867) 873-7654
Yellowknife NWT facsimile: (867) 873-0221
X1A 3S8

Appendix I: MSDS Sheets

Diesel (3 pages)
Propane (5 pages)

MATERIAL SAFETY DATA SHEET

SECTION 1 – PRODUCT IDENTIFICATION AND USE

Product name	Arctic Diesel Fuel	**PIN #, UN #**	1202
Chemical name	None	**TDG, DOT class**	Class 3
Common names and	Diesel fuel No. 1, Fuel oil #1-D	**Packing group**	III
Product use	Fuel	**Shipping name**	Diesel Fuel

WHMIS classification: Combustible liquid Class B Division 3; Toxic material Class D Division 2 Subdivision B

Hazard codes

NFPA	Health	2	**HMIS**	Health	2
	Flammability	2		Flammability	2
	Reactivity	0		Reactivity	0

NFPA & HMIS Ratings:0=Insignificant/No Hazard. 1=Slight Hazard. 2=Moderate Hazard. 3=High/Serious Hazard. 4=Extreme/Severe

Supplier	Irving Oil Limited, Refining Division Box 1260, Saint John New Brunswick Canada E2L 4H6	**Phone** **Emergency** **Refinery**	(506) 202-2000 1-800-424-9300 (506) 202-3000

SECTION 2 – HAZARDOUS INGREDIENTS

Ingredients	**CAS#**	**Wt** (%)	**ACGIH-TLVs** (2004)	**OSHA PELs** (general industry) (2004)	**NIOSH RELs** (2004)	**LD_{50}** (rat, oral)	**LC_{50}** (rat, 4 hours)
Diesel fuel no. 1	68334-30-5	100	200 mg/m^3 TWA (total hydrocarbon vapour)	NAv for this product name or	100 mg/m^3 TWA	>5 g/kg	~5g/m^3
May contain:							
Benzene	71-43-2	Trace	0.5 ppm TWA 2.5 ppm STEL	1 ppm TWA 5 ppm STEL	0.1 ppm TWA 1.0 ppm STEL	930 mg/kg	13,200 ppm
May also contain:							
Sulphur	7704-34-9	Trace	NAv	NAv	NAv	>8.4 mg/kg	NAv
Which, under certain circumstances, may result in the evolution of:							
Hydrogen sulphide (H_2S)	7783-04-6	NAp	10 ppm TWA 15 ppm STEL	20 ppm CEILING	10 ppm CEILING	NAp	444 ppm

Arctic diesel is a complex mixture of hydrocarbons. Its exact composition depends on the source of the crude oil from which it was produced and the refining methods used. Arctic diesel contains hundreds of individual organic chemicals. This section identifies only some of the well-known chemical constituents.

SECTION 3 – PHYSICAL DATA

Form	Liquid	**Vapour**	10.5 mm Hg @ 38°C
Colour	Colourless to pale yellow	**Evaporation rate**	NAv
Odour	Kerosene-like	**Boiling point**	157 to 261°C (315 to 501°F)
Odour	Not available	**Freezing point**	- 47°C (- 53°F)
Specific gravity	0.81 @ 15°C	**pH**	NAp
Vapour density	4.5	**Coefficient of water/oil**	3.3 to >6(Log P_{oct})

SECTION 4 – FIRE AND EXPLOSION HAZARDS

Flammability ☒ Yes ☐ No **Conditions** Easily ignited by heat, sparks or flames.

Flash point	40°C (104°F) (cc)	**Auto ignition**	210°C (410°F)
Lower flammable limit	0.7%	**Upper flammable limit**	5%

Explosion data: Sensitivity **Mechanical impact** Not expected to be sensitive **Static discharge** Yes

Means of extinction	In general, do not extinguish fire unless flow can be stopped. Use carbon dioxide, dry chemical, or foam. Cool containers with flooding quantities of water until well after the fire is out.
Special precautions	Vapour is heavier than air. It will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Vapour may travel to source of ignition and flash back. Containers may explode when heated.
Hazardous combustion products	Carbon monoxide. Nitrogen oxides. Aromatic hydrocarbons.

MATERIAL SAFETY DATA SHEET

SECTION 5 – REACTIVITY INFORMATION

Stability	Stable
Conditions to avoid	Sources of ignition. Static discharges. High temperatures.
Incompatible substances	Oxidizers such as peroxides, nitric acid, and perchlorates.
Hazardous decomposition products	Carbon monoxide. Nitrogen oxides. Aromatic hydrocarbons. H_2S and sulphur dioxide (SO_2) may be produced from minor amounts of sulphur in the product.

SECTION 6 – HEALTH HAZARD INFORMATION

Route of Entry

- ☐ **Eye**
- ☒ **Skin absorption** Diesel fuel itself, as well as some components
- ☒ **Inhalation**
- ☒ **Ingestion**

Hazardous Contact

- ☐ **Eye**
- ☒ **Skin contact**

Acute exposure Headache and other symptoms of central nervous system (CNS) depression, such as nausea and dizziness, as well as burning sensation in chest following inhalation. Aspiration into the lungs can cause severe pneumonitis (serious lung irritation), chest pain, and/or pulmonary edema (swelling). Ingestion may produce nausea, vomiting, and cramping.

Note: H_2S may offgas from the product in confined spaces such as the headspace in tanks, even though the concentration of sulphur in the product is minimal. H_2S is very toxic. At concentrations as low as 1 to 5 ppm, nausea and severe eye irritation may occur. Sense of smell may be impaired at about 20 ppm, with headache and respiratory tract lung irritation. At 250 to 500 ppm, potentially fatal pulmonary edema (fluid in the lungs) may occur. Dizziness, sudden (often fatal) collapse, unconsciousness, and death occur at higher concentrations. Pulmonary edema may be delayed as long as 48 hours.

Chronic exposure Dermatitis. Possibly blood and nervous system disorders. Fatigue, and severe nervous and respiratory system symptoms may follow survival of H_2S poisoning.

Carcinogenicity Benzene is known to be carcinogenic.
Exposure to fuel oils during refining is considered "probably carcinogenic to humans".
IARC and NTP classify untreated and mildly treated mineral oils as known human carcinogens. ACGIH, EPA, NIOSH, and OSHA have not classified them.

Mutagenicity	Not known to be mutagenic
Sensitization	No
Irritancy	Skin, respiratory
Teratogenicity	NAv
Reproductive toxicity	NAv

Toxicologically synergistic Other CNS depressants can be expected to produce additive or synergistic effects. May increase photosensitizing ability of certain chemicals, such as dinitrochlorobenzene (DNCB).

SECTION 7 – FIRST AID

Inhalation Move victim to fresh air Give artificial respiration if breathing has stopped and if a qualified AR administrator is available. Apply CPR if both pulse and breathing have stopped. Obtain medical attention immediately.

Ingestion Never give anything by mouth if the person is unconscious, rapidly losing consciousness, or convulsing. If the person is conscious, have them drink 8 to 10 ounces of water or milk to dilute the material in the stomach. **Do not** induce vomiting. If vomiting occurs spontaneously, have the person lean forward to avoid aspiration. Obtain medical attention immediately.

Eye If irritation occurs, flush eye with lukewarm, gently flowing fresh water for at least 10 minutes.

Skin Quickly and gently blot away excess chemical. Gently remove contaminated clothing and shoes under running water. Wash gently and thoroughly with water and non-abrasive soap. Obtain medical assistance.

SECTION 8 – PRECAUTIONARY MEASURES

Do not attempt rescue of an H_2S knockdown victim without the use of proper respiratory protective equipment.

Personal protective equipment	**Gloves**	Nitrile, Viton™, polyethylene preferred.
	Eye	Chemical safety goggle or face shield, as a good general safety practice.
	Respiratory	NIOSH-approved. SCBA or air line respirator with escape cylinder for confined spaces or work with sulphur-containing product. A qualified occupational health and safety professional should advise on respirator selection. If an air-purifying respirator is appropriate, use organic vapour
	Clothing & footwear	Coveralls to prevent skin contact with product. If clothing or footwear becomes contaminated with product, completely decontaminate it before re-use, or discard it.

MATERIAL SAFETY DATA SHEET

Engineering controls	Enclose processes. Use local exhaust ventilation to remove vapour at its site of generation. Handle laboratory samples in a fume hood. Use mechanical ventilation in confined spaces.
Handling procedures & equipment	Avoid heating open containers of product so as to minimize vapour production and accumulation. Use non-sparking equipment, explosion-proof ventilation, and intrinsically safe electrical equipment. Ground handling equipment. Have clean emergency eyewash and shower readily available in the work area.
Leak & spill procedure	Keep unauthorized persons away. Eliminate all sources of ignition. Ventilate area. Stop leak if it can be done safely. Prevent entry into sewers, waterways, or confined spaces. Absorb or cover with dry earth, sand or other non-combustible material and use clean, non-sparking tools to transfer to container.
Waste disposal	Consult local authorities for advice.
Storage	Cool, dry, well-ventilated area. No ignition sources. Containers should be vented and have flame
Shipping	Stable during transport. May be transported hot.

SECTION 9 – PREPARATION DATE OF MSDS

Prepared by	Irving Oil Limited, Refining Division	**Phone**	(506) 202-3000
Revision date	July 26, 2005	**To re-order MSDS,**	(506) 202-2000

MATERIAL SAFETY DATA SHEET

SECTION I – PRODUCT INFORMATION

Product Name: Propane
Trade Name: LPG (Liquefied Petroleum Gas)
Chemical Formula: C3H8
WHIMIS Classification: Class A – Compressed Gas
Class B, Division I – Flammable Gas

Supplier:

Business:

Non Medical Emergency:

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

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT

All components of this product are either on the Domestic Substances List (DSL) or are exempt.

SECTION II – HAZARDOUS INGREDIENTS

Components	CAS Registry No.	Proportion of Product	LC50	LD50
Propane	74986	95% - 98%	N/A	N/A
Ethane	74840	3% - 5%	N/A	N/A
Butane	791068	1% - 3%	N/A	N/A
Iso-Butane	75285	0.1% - 0.3%	N/A	N/A
Methane	74828	0.1% - 0.2%	N/A	N/A

Note: Composition given is typical for Grade 1 Propane; exact composition will vary from shipment to shipment.

- Explanation for change – HD5 refers to American specification, Grade 1 is Canadian equivalent in CGSB 3.14 Standard

SECTION III – CHEMICAL AND PHYSICAL DATA

Form: While stored under pressure – liquid and/or vapor
Boiling Point: -42 ^{o}C atm
Freezing Point: -188 ^{o}C
Evaporation Rate: Rapid (Gas at Normal Ambient Conditions)
Vapor Pressure: 1,013 (kPa) @ 26.0 ^{o}C
Vapor Density: 1.52 (Air = 1)
Coefficient of Water/Oil Distribution: Not available
PH: Not available
Soluble in Water: 6.1% by Volume @ 17.8 ^{o}C and 753 mmHg

Specific Gravity: 0.51 (Water = 1)
Appearance: Colorless liquid and vapor while stored under pressure.
Colorless and odorless gas in natural state at any concentration.
Commercial propane has an odorant added which is commonly ethyl mercaptan which has an odor similar to boiling cabbage or rotten eggs.
Odor Threshold: 4800 PPM
See Note 1 - Odorants

SECTION IV – FIRE OR EXPLOSION HAZARD DATA

Flash Point: -103.4 ^{o}C **Method**: Closed Cup
Flammable Limits: Lower 2.4%, Upper 9.5%
Auto Ignition Temperature: 432 ^{o}C
Products Evolved Due to Heat or Combustion: Carbon monoxide can be produced when primary and secondary airs are deficient while combustion is taking place.
Fire and Explosive Hazards: Explosive air-vapor mixtures may form if allowed to leak to atmosphere.
Sensitivity to Impact: No
Sensitivity to Static Discharge: Yes

Fire Extinguishing Precautions: Use water spray to cool exposed cylinders or tanks. Do not extinguish fire unless the source of the escaping gas that is fuelling the fire can be turned off. Fire can be extinguished with carbon dioxide and/or dry chemical (BC). Container metal shells require cooling with water to prevent flame impingement and the weakening of metal. If weakening, the area must be evacuated. If gas has not ignited, liquid and vapor may be dispersed by water spray or flooding.
Special Fire Fighting Equipment: Protective clothing, hose monitors, fog nozzles, self contained breathing apparatus.

SECTION V – REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Keep separate fro oxidizing agents. Gas explodes spontaneously when mixed with chlorine dioxide.
Incompatibility: Remove sources of ignition and observe distance requirements for storage tanks from combustible material, drains, and openings to buildings.
Hazardous Decomposition Products: Deficient primary and secondary air can produce carbon monoxide.
Hazardous Polymerization: Will not occur.

SECTION VI – TOXICOLOGICAL PROPERTIES OF MATERIAL

ACUTE EXPOSURE:

Eyes: As a gas, none, Liquid causes "cold burns'.
Respiratory System: Little physiological effect at concentrations below 10.000 PPM. Higher concentrations may cause dizziness and unconsciousness due to asphyxiation. ***SEE NOTE 2 – ASPHYXIANT.***
Chronic Exposure: There are not reported effects from long-term low-level exposure.
Other: Liquid can cause burns and frostbite if in direct contact with skin.
Sensitization Properties: Skin – unknown, **Respiratory** – unknown.
Carcinogenicity: Not determined. ***SEE NOTE 3 (NORM).***

MEDIAN LETHAL DOSE:
Oral: Not applicable for gas.
Inhalation: Not determined.
Dermal: Not applicable for gas.
Other: Not determined.
IRRITATION INDEX:
Skin: No appreciable effect (gas).
Eyes: No appreciable effect (gas).
Symptoms of Exposure: Above 10,000 PPM – dizziness, stupor, unconsciousness. ***SEE NOTE 2 attached.*** American Conference of Governmental Industrial Hygienists (ACGIH) classifies propane as an asphyxiate; there is no recommended "Threshold Limit Value" (TLV).
Teratogenicity: Not determined.
Mutagenicity: Not determined.

SECTION VII – OCCUPATION CONTROL PROCEDURES

Eyes: Safety glasses, goggles, or face shield required when transferring product.
Skin: Insulated gloves if contact with liquid or liquid cooled equipment is expected. Wear gloves and long sleeves when transferring product.
Inhalation: In atmosphere, where the concentration of propane would reduce oxygen level below 18% in inhaled air, self contained breathing apparatus required. ***SEE NOTE 3 – (NORM).***
Ventilation: Explosion proof ventilation equipment required in confined spaces.

SECTION VIII – EMERGENCY AND FIRST AID PROCEDURES

FIRST AID:
Eyes: Should eye contact with liquid occur, flush eyes with lukewarm water for 15 minutes. Obtain immediate medical care.
Skin: In case of "Cold Burn" from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If fingers or hands are frostbitten, have the victim hold his hand next to his body such as under the armpit. Obtain immediate medical care.

SPILL OR LEAK:
Eliminate leak if possible.
Eliminate source of ignition.
Ensure cylinder is upright.
Disperse vapors with hose streams using fog nozzles, watch for low area, as propane is heavier than air and can settle in low areas. Remain upwind of leak, keep people away.
Prevent vapor and/or liquid from entering into sewers, basements or confined areas.

SECTION 1X – TRANSPORTATION, HANDLING AND STORAGE

- Transport and store cylinders and tanks secured in an upright position in a ventilated space, away from ignition sources (so relief valve is in contact with vapor space of cylinder or tank).
- Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap or guard.
- Do not store with oxidizing agents, oxygen or chlorine cylinders.
- Transport, handle and store according to applicable federal and provincial regulations (CGA B149.2). ***SEE NOTE 4 – MAGNETIC RESIDUES.***

TDG Classification: 2.1 (gas)
TDG Shipping Name: Liquid Petroleum Gas (Propane)
TDG Special Provisions: 56, 90, and 102
PIN UN: 1075

SECTION X – PREPARTATION INFORMATION

Prepared by: Propane Gas Association of Canada
(403) 543-6500

Date prepared: March 2007

This information is in addition to the information supplied on the MSDS and forms a part of the MSDS by reference to note numbers indicated:

NOTE 1 ODOURANTS:

Odorants are not completely effective warning agents in all cases.
Certain odorants are polar and/or chemically reactive and may be depleted by reaction or absorption.
Sensitivity to odorants differs from person to person and may decrease with age or impaired physical conditions such as colds or respiratory allergies.
Prolonged exposure to odorants can create desensitization to the odor.

NOTE 2 ASPHYXIANT AND NARCOTIC EFFECTS OR PROPANE:

LPG's can displace air and can act as an asphyxiant. Lack of oxygen may cause dizziness, headaches, diminished awareness, faulty judgment, increase in fatigue and impaired muscular co-ordination. If these symptoms are identified while working in close proximity to propane that is released, go immediately into a fresh air environment.

LPG's are anaesthetic gases within the upper explosive limits and higher concentrations. A person working around propane in an enclosed space or in close proximity to a propane source such as filling cylinders, purging lines, investigating leaks, etc. who feels light-headed, dizzy, drunken, sleepy, or intoxicated should go immediately into fresh air. This narcotic effect may impair a person's judgment temporarily but will rapidly disappear in fresh air.

NOTE 3 NATURALLY OCCURRING RADIOACTIVE MATERIAL (NORM):

Sludges and tank scale from propane storage tanks, bulk delivery truck tanks, railway tank cars, and fuel filters and strainers screens may contain Naturally Occurring Radioactive Material (NORM) in the form of lead 210.

Equipment used for the transfer of propane such as propane piping and hoses, pumps and compressors may have detectable levels of radioactive lead 210 on inner surfaces.

Workers involved in cleaning, repair or maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities. Suitable codes of practice should be developed for the activities, detailing appropriate occupational hygiene and disposal practices.

NOTE 4 MAGNETIC RESIDUES IN PROPANE:

Magnetic residues generated in automotive fuel tanks from "mill scale" or corrosion processes may impair the operation of magnetic gauges and electronic solenoid valves.

Collection of gross amounts of solid residues can affect the proper operation of lock offs, mixers, pressure release valves, etc.

Solid residues could contain NORM (see note 3).

Appendix II: NU/NWT Spill Report Form

Spill Report Form (1 page)
Guide to Form (1 page)

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 873-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

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

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION

H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC

SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN

FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Instructions for Completing the NT-NU Spill Report Form

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

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

Appendix III: Immediately Reportable Spill Amounts

Table (1 page)

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities	Translated Laymen's Terms
1	Explosives	Any Amount	
2.3	Compressed gas (toxic)		
2.4	Compressed gas (corrosive)		
6.2	Infectious substances		
7	Radioactive		
None	Unknown substance		
2.1	Compressed gas (flammable)	Any amount of gas from containers with a >100L capacity	Propane
2.2	Compressed gas (non-corrosive, non-flammable)		> 100 lb cylinder
3.1	Flammable liquids	>100L	Diesel
3.2			half a drum/ 26 gallons
3.3			
4.1	Flammable solids	>25 kg	
4.2	Spontaneously combustible solids		
4.3	Water reactant		
5.1	Oxidizing substances	>50L or 50kg	
9.1	Miscellaneous products or substances excluding PCB mixtures		
5.2	Organic peroxides	>1L or 1kg	
9.2	Environmentally hazardous		
6.1	Poisonous substances	>5L or 5kg	
8	Corrosive substances		
9.3	Dangerous wastes		
9.1	PCB mixtures of 5 or more ppm	>0.5L or 0.5kg	
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	>100L or 100kg	
None	Sour natural gas (i.e. contains H2S)	Uncontrolled release or sustained flow of 10 minutes or more	
	Sweet natural gas		
In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NU/NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or sensitive wildlife habitat, poses imminent threat to human health or safety, poses imminent threat to a listed species at risk or its critical habitat, or is uncontrollable.			