December 19, 2023

DISTRIBUTION LIST

Spill Contingency Plan v.4.0 for Renewal of Land Use Permit W2016J0008 – Tundra Ecosystem Research Station, Daring Lake

Please accept this letter and attachment as the Spill Contingency Plan submission for section 15 of the Land Use Permit Application Package, associated with the renewal of the above referenced Land Use Permit for the Tundra Ecosystem Research Station (TERS) located at Daring Lake.

The permit W2016J0008 is currently expired as of November 3, 2023. A renewal would render it valid until November 2028. The spill response procedures at the research station remain the same as was originally permitted however, an increase in the station's maximum fuel volume capacity has been updated since the 2016 permit application and 2021 permit extension for TERS . Currently a Storage Authorization is in place until a new Land Use Permit can be granted to support continuing land use activities at TERS.

Please direct any comments or concerns with respect to the permit renewal to Colin Modeste-Burgin, TERS Camp Manager, at Colin_Modeste-Burgin@gov.nt.ca

Sincerely,

Heather Sayine-Crawford
Director
Wildlife Management Division

Attachments:

- ✓ Land Use Permit Application Form
- ✓ **Spill Contingency Plan – v.4.0**
- ✓ Waste Management Plan – v.3.0
- ✓ Project Details Plan
- ✓ Engagement Plan v.2.0
- ✓ Engagement Summary & Record

Spill Contingency Plan

Tundra Ecosystem Research Station

Daring Lake, NWT

Prepared for: 2023 Land Use Permit Application

Version 4.0

GNWT-ECC-Wildlife Division

TERS- Daring Lake, NWT

W2016J0008

Nov 2023

Project Summary

This spill contingency plan has been developed for the Tundra Ecosystem Research Station (TERS), located on Daring Lake, at 64°52'N, and 111° 35'W. TERS is operated by the Department of Environment and Climate Change (ECC), Government of the Northwest Territories (GNWT).

The current version of the spill contingency plan, associated with land use permit W2016J0008 will remain effective until a new land use permit is granted. This spill contingency plan, v.4.0 will then replace that plan and become effective once a new land use permit is approved.

Operations for spill management at TERS remain the same and have not changed, however an increase in fuel volume capacity for fuel caching at TERS has been made for the 2023 LUP Renewal Application. Additional copies of the current spill contingency plan are always available onsite, copies are also kept in the Wildlife Management Division, ECC, in Yellowknife.

This spill contingency plan has been developed to provide a plan of action in response to any spill or potential spill events at TERS. Overall, this plan describes the protocols, responsibilities of the onsite and offsite contacts for TERS, and details of the station, kits, and materials in place during operation of the GNWT Tundra Ecosystem Research Station at Daring Lake, Northwest Territories.

Revision History

Version #	Date	Section	Revision
1	Jul 2009	All	▪ Submitted to WLWB July 24, 2009
2.0	Sep 2016	4.0	▪ Spill Response - updated contact information of key personnel
		4.3	▪ Spill Response Team Contact List – updated contact list
2.1	Oct 2016	4.2.1	▪ Updated the hazardous waste disposal section - reviewer comments are based on inconsistences in spill contingency plan – See conformity table.
3.1	Oct 2021	Sections 4.0,4.3	▪ Updated onsite manager name. ▪ Updated name and contact information of wildlife and fish division director
4.0	Nov 2023	General	▪ Added a cover letter. ▪ Updated cover page, and document format ▪ Added summary section. ▪ Added revision history and conformity tables. ▪ Added definitions and acronyms Section
		Sections 1.0 – 1.9	▪ Added director contact information. ▪ Added project Information of TERS ▪ Added effective date section (originally in introduction) ▪ Added revisions section. ▪ Added distribution list section. ▪ Added TERS environmental policy to intro-project section. ▪ Moved purpose and scope to intro-project section
		Section 1.9.2	▪ Updated Species at Risk List
		Section 3.2, 3.3	▪ Updated maximum fuel stored on-site
		Section 4.2	▪ Updated spill response procedures – non permeable materials, disposal method.
		Section 4.3.3	▪ Added onsite camp manager to spill response team contact list

Conformity Table – Permit/Licence Conditions

Permit Condition	Permit Conditions	Location of Information	Conditions met
26 (1)(a)	Location and Area ▪ Existing Camp Location of Activities	Section(s): 1.0-1.9, Appendix A	✓
26 (1)(b)	Time ▪ Shall contact Inspector. ▪ Identify agent. ▪ Reports before removal	Section(s): 1.2	✓
26 (1)(c)	Type and Size of Equipment ▪ Only approved equipment	Section(s): 5.0,	✓
26 (1)(e)	Type, Location, Capacity, and Operation of all facilities ▪ Clean work area sumps from water	Section(s): 2.0-3.3	✓
26 (1)(g)	Use, Storage, Handling, and Ultimate Disposal of Any Chemical or Toxic Material ▪ Report Spills ▪ Waste Petroleum Disposal	Section(s): All - SMP	✓
26 (1)(h)	Wildlife and Fish Habitat ▪ Habitat Damage	Section(s): 1.5-1.9	✓
26 (1)(i)	Storage, Handling, and Disposal of Refuse or Sewage ▪ Waste Management ▪ Remove Garbage ▪ Sewage Disposal	Sections: See Waste Management Plan	✓
26 (1)(j)	Protection of Historical, Archaeological, and Burial Sites. ▪ Archaeological Buffer ▪ Site Disturbance ▪ Site Discovery and Notification	Section(s): 1.9.3	✓
26 (1)(m)	Fuel Storage ▪ Seal Outlet ▪ Fuel Containment ▪ Mark Containers ▪ Spill Contingency Plan ▪ Spill Response ▪ Drip Trays ▪ Fuel Near Water ▪ Clean Up Spills	Section(s): 2.0-3.0	✓
26(1)(p)	Display of Permits and Permit Numbers - Display Permit - Resubmit Plan - Engagement Plan - Summary of changes	Section(s): 1.3	✓

Conformity Table – WLWB and Public Review

Date	Organization	Topic
09-Oct-2014	Wek'èezhìı Renewable Resources Board	Spill Contingency Plan
Source	WRRB_TERS_comments_Oct_9_2014_final.pdf	
Recommendation		
▪ Provide general step-by step spill response procedures for actions to be taken in the event of a spill. ▪ Clarify that personnel have received spill response training (e.g., use of spill kits, basic first aid, WHMIS training) to aid with the implementation of emergency response procedures.		
Proponent Response		
Revised training section, and step by step actions for type of spills.		

Oct 17, 2016	Review Board- Comment Summary	Hazardous Waste Disposal
Source	W2016J0008 - GNWT-ENR - TERS - Review Summary and Attachments - Oct 28_16.pdf (mvlwb.ca)	
Recommendation		
Recommendation: Please comment on the apparent inconsistencies. ▪ Page 11 of the Spill Contingency Plan (section 4.2.1) it is noted that contaminated absorbent mats would be disposed of through incineration. ▪ Page 12 (section 4.2.5) it also notes "any contaminated soil and/or vegetation will be placed on impermeable material and burned. All remaining soil/vegetation will be placed in bags or re-sealable metal drums (at least 3 onsite at any one time) and flown to Yellowknife for appropriate disposal. All fuel-soaked absorbent material will be incinerated." ▪ The Waste Management Plan notes that contaminated materials (i.e., absorbent pads) are shipped to Yellowknife for disposal.		
Proponent Response		
Oct 17, 2016: Thank you for noting these inconsistencies; they were not intentional. I would like to clarify that all fuel contaminated waste will be placed in bags or resealable metal drums and shipped off-site for disposal at an appropriate facility. I will revise the Spill Contingency Plan to reflect this statement and ensure it is consistent throughout.		

Oct 24, 2023	Wek'èezhìı Land and Water Board	General
Source	GNWT-ECC - TERS - LUP Application - Deemed Incomplete - Oct 24_23.pdf (mvlwb.ca)	
Recommendation		
• Add cover letter, cover page, revision history table, and conformity table		
Proponent Response		
Added/revised sections of plan		

Conformity Table – WLWB and Public Review

Date	Organization	Topic
01-Dec-2023	GNWT-ECC, Manager -Resource Management	Spill Contingency Plan
Source	Email Correspondence: Pre-submission engagement – application materials	
Recommendation		
• Update fuel stored on site		
Proponent Response		
Updated section 3.2 and 3.3		

07-Dec-2023	GNWT-ECC, Wildlife Biologist	Spill Contingency Plan
Source	Email Correspondence: Pre-submission Engagement	
Recommendation		
▪ Update Species at Risk list		
Proponent Response		
Updated species at risk list.		

Acronyms

Term	Definition
ECC	Department of Environment and Climate Change
GNWT	Government of Northwest Territories
LUP	Land Use Permit
SCP	Spill Contingency Plan
TDG	Transportation of Dangerous Goods
TERS	Tundra Ecosystem Research Station
TSCC	Tundra Science and Culture Camp
WHMIS	Workplace Hazardous Materials Information System
WLWB	Wek'èezhìı Land and Water Board
WMA	Wek'èezhìı Management Area
WMP	Waste Management Plan

Definitions

Term	Definition
Domestic Waste	Also known as household waste, which can include garbage or rubbish and normally originates in a private home. Domestic waste may contain a significant amount of toxic or hazardous waste
Fuel Storage Container	A container for the storage of petroleum products.
Hazardous Waste	A waste which, because of its quantity, concentration, or characteristics, may be harmful to human health or the environment when improperly treated, stored, transported, or disposed.
Secondary Containment	Containment that prevents liquids that leak from fuel storage containers (i.e., Fuel Drums), from reaching outside the containment area into the environment.

Table of Contents

List of Tables

1.0 Introduction

This Spill Contingency Plan ("the plan") has been developed for the Tundra Ecosystem Research Station (TERS), located on Daring Lake, at 64° 52'N, and 111° 35'W. TERS is operated by the Department of Environment and Climate Change (ECC), Government of the Northwest Territories (GNWT).

The plan has been developed to provide a plan of action in response to any spill or potential spill events at the Tundra Ecosystem Research Station. Overall, the plan describes the protocols, responsibilities of the onsite and offsite contacts for TERS, and details of the station, kits, and materials in place during operation.

Copies of the spill contingency plan (SCP) are available onsite and are also kept by the Wildlife Management Division, ECC, in Yellowknife.

Contact information contained in this document is **updated annually**.

1.1 Project and Contact Information

Contact Information

Name:	**Heather Sayine-Crawford**		
Position:	Director, Wildlife Management Division		
Company Name:	Environment and Climate Change, Government of the Northwest Territories		
Mailing Address:	PO Box 1320		
Community:	Yellowknife	**Telephone:**	867-767-9237 ext. 53230
Prov/Terr:	NWT	**Email:**	Heather_Sayine-Crawford@gov.nt.ca
Postal Code:	X1A 2L9	**Other:**	

Project Information

Project Name:	**Tundra Ecosystem Research Station (TERS)**		
Department	GNWT – Environment and Climate Change – Wildlife Management Division		
Location:	Daring Lake, NWT	Region:	North Slave
Coordinates:	64°52'N, and 111° 35'W.	Operation Date:	May – September
TERS On-site Manager:	Colin Modeste-Burgin		
Email:	Colin_modeste-Burgin@gov.nt.ca	Phone:	867-446-5995
On-site Sat Phone:	011-8816-315-64342	Land Use Permit:	W2016J0008 Expires: 03-Nov-2023

1.2 Effective Date of Spill Contingency Plan v.4.0

The current version of the spill contingency plan, associated with the Land Use Permit W2016J0008 will remain active. This version of the Plan – **Spill Contingency Plan v.4.0** will be effective once a new land use permit is granted and replace the previous version.

Prior to seasonal commencement, an email notification at least 48 hours before land use operations will be sent to the Land's inspector and associated parties within the distribution list below. This will include a start date, project contacts (onsite and offsite managers), and contact information. A similar email will be sent ten days prior to re-iterate a seasonal camp shutdown of land use operations.

1.3 Revisions to Spill Contingency Plan

The most recent revision occurred in December 2023 (please see revision history and the conformity tables on pg. ii). Revisions are made by the GNWT Wildlife Management Division. Updates will occur in response to any comments received from the Wek'èezhìı Land and Water Board and involved parties of the Tundra Ecosystem Research Station (see conformity table on pg. iii-v of the plan for any related updates). This plan is reviewed annually, and approved permits are displayed onsite.

1.4 Distribution List

This Spill Contingency Plan and the most recent revisions have been distributed to the following parties:

Representative(s)	Association
Ryan Fequet **Anneli Jokela** **Roberta Judas**	Wek'èezhìı Land and Water Board (WLWB)
Violet Camsell-Blondin	Tlicho Government
Stephanie Poole	NWT Treaty 8 Tribal Corporation – Akaitcho Interim Measures Agreement Implementation Office
Wynter Kuliktana **Tannis Bolt**	Kitikmeot Inuit Association
Noah Johnson	North Slave Metis Alliance
Johanne Black **Ryan Miller**	Yellowknives Dene First Nation
Minnie Whimp	Deninu Kue First Nation
Tas-Tsi Catholique	Lutsel K'e Dene First Nation
Jody Pellissey **Laura Meinert**	Wek'èezhìı Renewable Resource Board
Naomi Smethurst **Glen Mackay**	GNWT- Prince of Wales Northern Heritage Centre
Scott Stewart	GNWT – ECC, Regional Superintendent of the North Slave Region
James Hodson	GNWT – ECC, Wildlife Biologist
Clint Ambrose **Karine Gignac**	GNWT – ECC, North Slave Region

1.5 Spill Contingency Plan Purpose and Scope

The purpose of the TERS Spill Contingency Plan is to provide a plan of action for potential spills that may occur at the research station. The plan is intended to provide a clear course of action for TERS residents should a fuel spill occur, thus minimizing environmental damage and ensuring maximum safety for camp users. The plan also clearly describes the chain of responsibility should a spill occur. Communication and reporting procedures are clearly outlined. Both management and field staff should be familiar with the plan. In addition, it is to be located onsite and accessible, as a reference document.

1.6 TERS Environmental Policy

ECC is committed to providing a quality research facility and safe working environment for all TERS users. All activities are to be conducted in a manner that is safe to people and the environment. Each individual user of TERS is to share in the responsibility of ensuring the safety of themselves and others while respecting the environment and maintaining the high standards established for camp operations. All persons are expected to take the necessary precautions to protect themselves and others from undue risk.

1.7 Project Description

TERS functions as a base for both short (1 year) to long (15+ years) ecosystem research and monitoring. The station was originally set up to serve as a control site for studies examining effects of the Ekati diamond mine on the environment. Since its inception, it has grown to provide support for university along with intra- and inter-governmental research in addition to continuing monitoring programs associated with the Ekati and Diavik diamond mines.

TERS also provides educational programs, including the annual Tundra Science and Culture Camp (TSCC). The TSCC is a ten-day cross-cultural science camp for 14- to 17-year-old students from communities throughout the NWT. TSCC has a joint focus of scientific instruction and traditional knowledge studies with participation from the surrounding Tłı̨chǫ communities. Research at TERS involves measuring ecological and climate related changes on a pristine sub-arctic ecosystem. As such, TERS endeavors to have minimal environmental impact.

1.8 Site Description

The TERS camp is located approximately 300 km north of Yellowknife. It encompasses an area of approximately 0.5 hectares on the shores of Daring Lake, NT (64° 52’N, 111°35’W). The camp is located on a flat area on the south side of an esker. There are 10 Weather haven tents (2 bunk tents, 1 kitchen tent, 2 labs, 1 wash house, 3 storages, 1 office). Other structures include a fuel/tool storage shed, 2 latrines, an incinerating toilet building, a dock, fuel cache berms, and boardwalks throughout. The entire living area (including all structures except the dock and fuel cache area) is enclosed by a solar-powered electric bear fence. See Appendix A for site drawing.

1.9 Potential Ecological Impacts

1.9.1 Barren ground Caribou

TERS is located within the range (migration route) of the Bathurst caribou herd. Caribou are frequently sighted by camp residents during spring (May) and late summer (August onwards). There are no activities at the research station that may potentially disrupt caribou activities. Air traffic to and from the camp consists of approximately 0-2 flights per week, pilots maintain safe flying altitudes (500m) when and if large groups of caribou (>200 animals) are sighted in the area. There is a strict no-hunting policy followed by all researchers using the camp.

1.9.2 Species at Risk, COSEWIC Assessed Species

Monitoring programs ongoing at TERS collect data on all the species listed below. In addition, every precaution is taken to limit any impact the presence of TERS has on these species, and their habitat. There are several species that may occur in the Daring Lake area that have been assessed, these include:

Species	NWT SARC	COSEWIC	SARA	NWT GS Rank
Barren-ground Caribou	Threatened	Threatened	Under consideration	At Risk
Grizzly Bear	Special Concern	Special Concern	Special Concern	Sensitive
Wolverine	Not at risk	Special Concern	Special Concern	Sensitive
Eskimo Curlew	Not applicable	Endangered	Endangered	At Risk
Harris's Sparrow	Not applicable	Special Concern	Special Concern	Sensitive
Lesser Yellowlegs	Not applicable	Threatened	Under consideration	Sensitive
Peregrine Falcon (Anatum-tundrius complex)	Not at Risk	Not at risk	No status	Sensitive
Red-necked Phalarope	Not Applicable	Special Concern	Special Concern	Sensitive
Rusty Blackbird	Not assessed	Special Concern	Special Concern	Sensitive
Short-eared Owl	Not assessed	Threatened	Special Concern	At Risk

1.9.3 Archaeological Sites

There are a number of archaeological sites located in the vicinity of TERS. These have been identified and inventoried by staff from the Prince of Wales Northern Heritage Centre, in Yellowknife. The location of the camp itself does not infringe on any archaeological sites.

2.0 Existing Preventative Measures

Proper storage and handling of fuels and hazardous materials is the first line of defense for preventing spills and potential impacts to people and the environment. The on and offsite Camp Managers are required to have up-to-date training in Workplace Hazardous Materials Information System (WHMIS), fuel spill response, and wilderness first aid. A fully equipped Fuel Spill Response Kit is kept onsite in a re-sealable drum adjacent to the fuel shed and near the back gate access to the fuel cache. Contents of the kit are described in section. 5.0 Resources and Training.

2.1 Fuel Transport and Storage

Fuel required for TERS is transported to the station via fixed wing aircraft. Drums are moved to a fuel cache behind the camp, at the base of an esker. Two Insta-Berm portable fuel berms (http://www.sei-ind.com/products/insta-berm) approximately 10’ X 20’ X 12” in size provide secondary containment in the event of leakage, drums are then placed horizontally with the bungs positioned at 3 and 9 o' clock on wooden slats inside the fuel berm. The camp is situated on a small peninsula and the fuel cache is situated at the farthest possible point from the Daring Lake high water mark. Secondary containment was installed in 2015 and 2016 and is maintained throughout the operating season by ensuring any accumulated water / debris is removed, material is intact and side L-brackets are properly situated. each fuel berm has a max capacity of 5600 L of fuel volume should a leak occur. If extra fuel is to be stored on site, then extra fuel berms will be purchased to accommodate the extra volume stored at TERS.

Fuel stored at TERS will not exceed the listed maximum amounts in table 1 section 3.2 below. Table 1 outlines the capacities of fuel that TERS normally operates in, should more fuel be required at TERS onsite listed in table 1, then the GNWT wildlife division will seek an amendment to the WLWB land use permit for TERS.

Fuel used in camp equipment is transferred from drums to plastic gas cans using a manual pump, these cans are also filled inside the fuel berm (Secondary Containment). When the manual pump is used, absorbent pads are strategically placed so that a minimal amount of fuel escapes into the environment. In addition, absorbent pads are placed underneath the manual pumps when they are in storage to catch any excess fuel that may leak out of the pump apparatus.

Propane is used for the incinerating toilet, cook stove, hot water heater and fridge. Propane tanks are generally not cached, but instead are shipped in when needed on available flights, and placed in the location where they will be utilized.

2.2 Chemical Use and Storage

Only a few liters of cleaning supplies are kept onsite. These include household cleaning agents such as dish and laundry detergent, soaps, paint thinner, etc. None of these chemicals present a serious environmental threat should they escape into the environment.

TERS is designed to have minimal risk to the environment. As such, the following preventative measures are in place:

- The area where fuel is cached has secondary containment through the use of two Insta-Berms and located as far away as practical from the lake shore. Extra fuel berms will be purchased as needed.
- Drip trays are placed below pumps when stored.
- Spill kits are located wherever fuel (or motor vehicles) is stored.
- Absorbent pads are used whenever refueling motorized vehicles to catch any drips.
- Fuel drums are inspected on a regular basis by the onsite Camp Manager.
- Absorbent pads are wrapped around pipe joints between heating fuel tanks and valves.
- Fluids are drained from scrapped or immobile motorized vehicles/equipment.

3.0 Risk Assessment

3.1 Fuel handling and storage

The following potential risks have been identified. The probability of spills due to the identified risks is low due to regular inspection of stored fuel and equipment associated with fuel transfer.

- Leaking fuel drums (bung seals).
- Leaking valves between fuel drums and heaters.
- Leaks or spills occurring during fuel transfer between storage drums and snowmobiles, aircraft, ATV, pumps, boats, generators, and/or jerry cans. This could include broken supply pipes, hoses, pumps, and associated equipment.
- Leakage of propane due to faulty valves.

3.2 Hazardous Materials Stored Onsite

Very little hazardous materials are stored onsite; however, the fuel cache is in close proximity of the camp. The volume and location of the fuel cache is included in Table 1. Material Safety Data Sheets (MSDS) for fuels stored onsite are provided in Appendix D.

Table 1. List of hazardous materials found on site, including the storage container type and volume, the volume normally onsite, the maximum volume on site, and its storage location and intended uses.

Material	Storage Container	Normally onsite	Maximum onsite	Storage location and uses
Heating Oil	200L drums	2400L (12 drums)	7200L (35 drums)	Drums stored in fuel cache area. Used for heating buildings.
Jet A/ B Fuel	200L drums	3000L (15 drums)	7200L (35 drums)	Located in fuel cache area. Fuel used for air support to field programs.
Avgas	200L drums	3000L (15 drums)	7200L (35 drums)	Located in fuel cache area. Fuel used for air support to field programs.
Gasoline	200L drums	1200L (6 drums)	7200L (35 drums)	Stored in the fuel cache area. Some stored in the fuel shed in 5-gallon jerry cans. Used in vehicles such as snowmobiles, ATV, and outboard motors.
Propane	45kg cylinders	450kg (10 cylinders)	900kg (20 cylinders)	Stored near buildings where used. For use in kitchen stove, fridge, water heater.

3.3 Potential spill sizes and sources

Table 2 outlines all the potential spill materials, potential discharge volumes, potential worst-case scenarios, and the probable direction of discharge.

Table 2. List of hazardous materials on site, potential discharge events, potential discharge volumes (worst case scenario in brackets), and direction of potential discharge.

Material (sources)	Potential Discharge Event	Discharge volume (worst case)	Direction of potential discharge
Jet A/B (aircraft)	▪ overfilling of aircraft ▪ slow leak from storage drums ▪ large puncture, fast leaking drum ▪ leak from hose	Likely under 200L Maximum of 7200L (very unlikely)	From fuel storage area, underground seepage into Daring Lake. From on the water refueling, spill could go directly into Daring Lake.
Avgas	▪ overfilling of aircraft ▪ slow leak from storage drums ▪ large puncture, fast leaking drum ▪ leak from hose while filling	Likely under 200L Maximum of 7200L (very unlikely)	From fuel storage area, underground seepage into Daring Lake. From on the water refueling, spill could go directly into Daring Lake.
Heating Oil	▪ overfilling of the oil tanks ▪ slow leak from storage drums ▪ large puncture, fast leaking drum ▪ leak from hose	Likely under 200L Maximum of 7200L (very unlikely)	From fuel storage area or camp area, underground seepage into Daring Lake.
Propane cooking, heating, refrigeration, incinerating toilet	▪ slow leak from valve ▪ puncture of tank (fast leak) ▪ all drums punctured and leaking at once. ▪ leak while connecting	Likely under 45kg, maximum of 900kg (very unlikely)	In camp near buildings, release into the air (inside or outside depending on where the leak is).
Gasoline (snowmobiles, boat motors, ATV)	▪ overfilling gas tanks ▪ slow leak from storage drums ▪ puncture, fast leaking drum ▪ leak from hose	Likely under 200L Maximum 7200L (very unlikely)	In camp or in fuel storage area, underground seepage to Daring Lake.

3.4 Potential Environmental Impacts of a spill (Including the worst-case scenario)

The risk presented by the hazardous materials on site is low. During the winter months it is decreased because snow will act as a natural absorbent, and the ice will act as a barrier between the spill material, the ground and Daring Lake. Table 3 provides an assessment of environmental impacts from a spill of hazardous materials including worst-case scenarios.

Table 3. Potential environmental impacts of a spill.

Material	Environmental impacts	Worst Case Scenario
Aircraft Fuel (Jet A/B)	If contact is made, Jet A and B are harmful to wildlife and aquatic life. If released into the environment, it has the potential to bioaccumulate, and is slow to biodegrade.	All drums are punctured, and fuel is released into the environment, including Daring Lake. Wildlife and aquatic life that encounter spilled fuel are at risk to suffer negative health effects and/or die.
Aircraft Fuel (Avgas/100 LL)	When released into the environment, Avgas has a negative effect on wildlife and aquatic life. It is volatile, and may disperse quickly, but release into water is hazardous to environmental health and safety.	All drums are punctured, and all fuel is released into the environment. All fuel makes its way into Daring Lake.
Gasoline	When released into the environment, gasoline has a negative effect on wildlife and aquatic life. It is volatile, and may disperse quickly, but release into water is hazardous to environmental health and safety.	All drums are punctured, and all fuel is released into the environment. All fuel makes its way into Daring Lake.
Propane	Propane has the potential to bio-accumulate when released into the environment. It is extremely flammable, therefore its release into the air may be potentially very hazardous.	All cylinders are punctured, and all propane is released into the air and environment.
Heating Oil	Release of heating oil into the environment has potential to cause harm to wildlife and aquatic life. It can be persistent unless cleaned up. It also has the potential to bioaccumulate in the environment.	All drums are punctured, and all fuel is released into the environment. All fuel makes its way into Daring Lake.

4.0 Spill Response

The key personnel involved in spill response include:

Onsite Camp Manager: Colin Modeste-Burgin - (867) 446-5995 (cell)

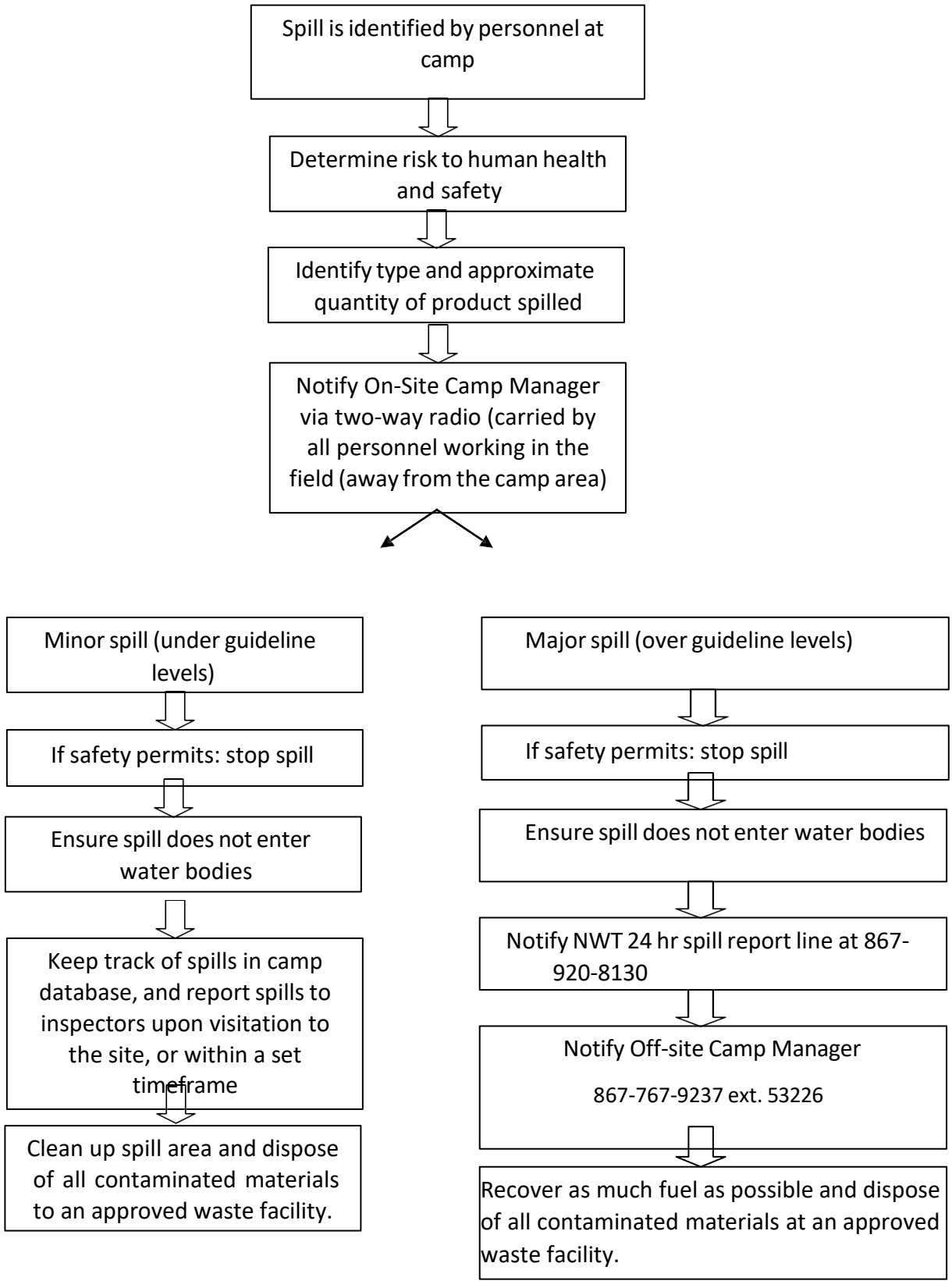
Offsite Camp Manager: Brad Woodworth - (867) 767-9237 ext. 53226 (office)

There is one onsite satellite phone available for use in case of an emergency located in the kitchen tent; Wi-Fi calling to the Onsite Camp Manager is also enabled. In the event of an accidental spill that may cause risk to human health and safety, or may cause serious damage to the environment, notifications will be made via Sat phone or cell. In addition, when any TERS users are in the field, they are required to carry two-way radios in case of an emergency.

Following the identification or reporting of a spill to the Onsite Camp Manager, the next action will be to report the spill to the 24-hour NWT Spill Hotline. The Onsite Camp Manager will inform the Offsite Camp Manager (located in Yellowknife) who will notify the requisite inspectors as necessary.

All public or media enquiries are to be made to the Offsite Camp Manager, Wildlife Management Division, Department of Environment and Climate Change, GNWT, Yellowknife.

4.1 Spill Response Flow Chart



4.2 Spill Response Procedures

Fuel spill response equipment is contained in a re-sealable metal drum adjacent to the fuel shed and back gate access to the fuel cache (contents listed in section 5.0 Resources and Training).

Additional absorbent fuel spill pads are stored in the fuel shed.

See Spill Response Flow Chart (section 4.1) for process to follow if and when a spill occurs. Detailed actions are provided below:

4.2.1 Spills on Land

Steps to follow if a spill on land is identified:

- identify the source of the leak or spill.
- contain the spill at the source if possible.
- stop a leak from a barrel.
- cease filling operations if leaking vessel is receiving fuel.
- check valves and seals, and ceasing use of these valves, if leaking.
- transfer all fuels from leaking barrels; and,
- place proper spill absorbants at the foot of the leak to minimize seepage of the spilled material to the environment.

Spills on land can be contained and cleaned up by the following methods:

- place a soil berm down slope of the running or seeping fuel.
- place non-permeable sheeting at the foot of and over the berm to permit the fuel to pool on the non-permeable material for easy capture. Berms can be made of snow and lined with non-permeable material in the winter.
- use absorbent mats to soak up the fuel. The fuel can be squeezed from the mats into re-sealable metal drums or plastic pails, and the pads can be disposed of in a self-contained unit to be disposed of at an approved waste facility.
- Larger pools of fuel can be pumped into empty drums. It is especially important to prevent fuel from entering a body of water where it will have a greater environmental impact;
- place a light covering of Sphag Sorb or alternate absorbent material onto soil or vegetation to absorb films of petroleum products; and,
- place contaminated absorbent mats, used Sphag Sorb, vegetation and/or soil into a metal re-sealable drum or self-contained unit for transport off-site and disposal at an appropriate facility.

4.2.2 Spills on Water

Implementing the following steps can control spills of petroleum products on water:

- deploy floating boom(s) to contain the floating product.
- use a skimmer once a boom has been secured to capture the spilled product, and then pump it through hoses to empty fuel drums; and,
- use absorbent mats or similar materials to capture small spills on water.
- Send contaminated materials to an approved waste facility

4.2.3 Spills on Snow and Ice

Spills on snow and/or ice can be contained and cleaned up by the following methods:

- construct a snow berm, lined with non-permeable sheeting, around the edge of the spill; and
- shovel and scrape contaminated snow and ice and placing them into re-sealable metal drums or on non-permeable material and within non-permeable lined berms on land.

4.2.4 Chemical Spills

The effects of chemical spills can be reduced by the following methods:

- apply absorbents to soak up liquids.
- place non-permeable sheeting over solid chemicals, such as dusts and powders, to prevent their disbursement by wind or investigation by birds or other wildlife; and
- neutralize acids or caustics by placing spilled material and contaminated cleanup supplies in an empty refuge drum and seal for disposal at an approved waste facility.

4.2.5 Disposal

Any contaminated soil and/or vegetation and fuel-soaked absorbent materials will be

- placed in bags or re-sealable metal drums (at least 3 onsite at any one time)
- shipped off-site for disposal at an appropriate facility.

4.3 Spill Reporting Chain of Responsibility

4.3.1 The responsibilities of the On-site Camp Manager

- Assume authority over the spill area and personnel involved;
- Initiate the Spill Contingency Plan;
- Evaluate and assess the magnitude of the spill (see Appendix B for reporting requirements related to spill size);
- If necessary, report the spill to the **NWT 24-hour Spill Report Line at (867) 920-8130;**
    - Provide information such as:
    - location of the spill;
    - direction of flow (if any);
    - type and volume of material spilled;
    - cause of spill;
    - date and time of spill; and,
    - any perceived threat to human health and/or the environment.
- Develop an overall plan of action; and,
- Report to the Off-site Camp Manager and provide recommendations on resource requirements (additional manpower, equipment, material, etc.) to complete the cleanup effort.

4.3.2 The responsibilities of the Off-site Camp Manager

- If needed, organize additional spill response, and clean-up resources;
- If needed, act as liaison with other government agencies as well as the public and the media;
- Ensure that the correct documentation of the spill, and the cause of the spill the cause of the spill is properly documented (see Appendix C for NWT Spill Form), monitor the effectiveness of the cleanup effort, and oversee the implementation of appropriate measures to prevent a recurrence of the spill;
- ensure that follow-up documentation required by appropriate regulators is prepared and submitted; and,
- ensure that the spill is cleaned up and all follow-up communication and reports are filed with Environmental Protection and Waste Management Division, ECC, GNWT in Yellowknife.

4.3.3 Spill Response Team Contact List

Colin Modeste-Burgin **- TERS On-site Camp Manager**	**(867) 446-5995 Cell** **Onsite SAT Phone: 011-8816-315-64342**
Brad Woodworth **– TERS Off-site Camp Manager**	**867) 767-9237 ext. 53226 Office.**
Heather Sayine-Crawford **– Director, Wildlife Division, ECC, GNWT**	**(867) 767-9237 ext. 53230**
NWT Spill Hotline	**(867) 920-8130**

5.0 Resources and Training

For the purpose of spill containment and clean up, a Fuel Spill Response Kit is required, it is located adjacent to the fuel shed by the back access gate to the fuel cache site. The contents of the Kit include:

- 2 Safety goggles
- 1 Danger "no smoking" sign
- 2 coverall suit (Size 3XL)
- 2 Pair polyvinyl chloride gloves
- 1 tube composite sealant
- 4 Lrg orange Heavy Duty bags (to store used materials)
- 4, 10 ft absorbing boom/pads/for use on water
- 10, 4 ft absorbing sock pads (white – repels water)
- Approximately ~ 400 absorbing pads (white – repels water)) The following training is required for On and Off-site Camp Managers:
- WHMIS certification which meets the Canadian Occupational Health and Safety Regulations (available online https://worksitesafety.ca/product-category/online- training/?fwp_product_cat_facet=canada-online-training)
- Wilderness First Aid certification
- Fuel Spill Response

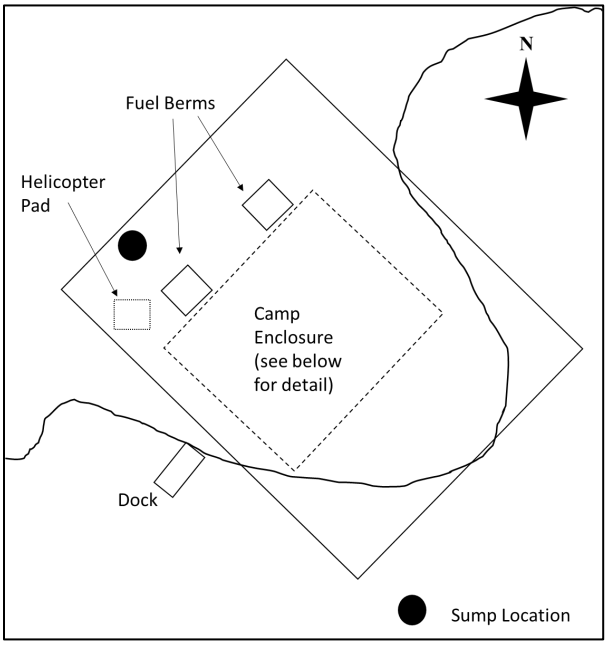
The latter two courses are most often taken through a local company in Yellowknife, Arctic Response, which provides workplace training courses in a variety of areas.

APPENDIX A – Diagrams of Site and Fuel Cache

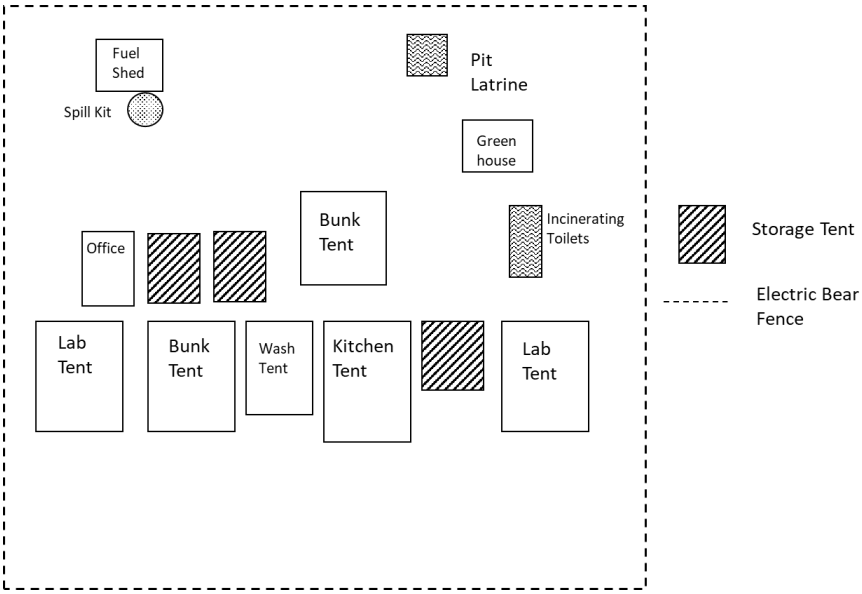
Figure 1 – Site Diagram

Figure 1 - Drawing depicting a) the placement of the land use permit area, camp and fuel cache, as well as b) detail of the camp layout. Not drawn to scale.

a) Land Use Permit Area, Camp and Fuel Cache



b) Camp Layout Detail (Not drawn to scale)



APPENDIX B – Fuel Spill Volumes that trigger NWT Spill Hotline reporting.

Figure 2 – Fuel Spill Volume Trigger

Note: L = litre; kg = kilogram; PCB = Polychlorinated Biphenyls; ppm = parts per million

Substance	Reportable Quantity	TDG Class
Explosives Compressed gas (toxic/corrosive) Infectious substances Sewage and Wastewater (unless otherwise authorized) Radioactive materials Unknown substance	Any amount	1.0 2.3/2.4 6.2 6.2 7.0 None
Compressed gas (Flammable) Compressed gas (Non-corrosive, non-flammable)	Any amount of gas from containers with a capacity grater than 100L	2.1 2.2
Flammable liquid	≥100 L	3.1/3.2/3.3
Flammable solid Substances liable to spontaneous combustion Water reactant substances	≥ 25 kg	4.1 4.2 4.3
Oxidizing substances	≥ 50 L or 50 kg	5.1
Organic peroxides Environmentally hazardous substances intended for disposal	≥1 L or 1 kg	5.2 9.0
Toxic substances	≥ 5 L or 5 kg	6.1
Corrosive substances Miscellaneous products, substances or organisms		8.0 9.0
PCB mixtures of 5 or more ppm	≥ 0.5 L or 0.5 kg	9.0
Other contaminants--for example, crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater.	≥ 100 L or 100 kg	None
Sour natural gas (i.e., contains H_2S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more	None
Flammable liquid Vehicle fluid	≥ 20 L When released on a frozen water body that is being used as a working surface	3.1/3.2/3.3 None
Reported releases or potential releases of any size that: are near or in an open water body; are near or in a designated sensitive environment or habitat; Pose an imminent threat to human health or safety; or Pose an imminent threat to a listed species at risk or its critical habitat	Any Amount	

APPENDIX C – NWT Spill Report Form

Figure 3 – Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND
OTHER HAZARDOUS MATERIALS

Northwest Territories · Nunavut · Canada · Inuvialuit Land Administration

NT-NU 24-HOUR SPILL REPORT LINE
Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date: MM DD YY	Report Time:	☐ Original Spill Report OR ☐ Update # _____ to the Original Spill Report	**Report Number:**
B	Occurrence Date: MM DD YY	Occurrence Time:		
C	Land Use Permit Number (if applicable):		Water Licence Number (if applicable):	
D	Geographic Place Name or Distance and Direction from the Named Location:		Region: ☐ NT ☐ 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: ☐ Potential Spill	Quantity in Litres, Kilograms or Cubic Metres:	U.N. Number:	
I	Spill Source:	Spill Cause:	Area of Contamination in Square Metres:	
J	Factors Affecting Spill or Recovery:	Describe Any Assistance Required:	Hazards to Persons, Property or Environment:	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials:			

L	Reported to Spill Line by:	Position:	Employer:	Location Calling From:	Telephone:
M	Any Alternate Contact:	Position:	Employer:	Alternate Contact Location:	Alternate Telephone:

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:

Lead Agency: ☐ EC ☐ CCG/TCMSS ☐ GNWT ☐ GN ☐ ILA ☐ AANDC ☐ NEB ☐ Other: _____

Significance: ☐ Minor ☐ Major ☐ Unknown

File Status: ☐ Open ☐ Closed

Agency:	Contact Name:	Contact Time:	Remarks:
Lead Agency:			
First Support Agency:			
Second Support Agency:			
Third Support Agency:			

APPENDIX D – Material Safety Data Sheets

Figure 4 – MSDS Sheet – Gasoline, Unleaded

PETRO-CANADA

Material Safety Data Sheet

NFPA	HMIS (U.S.A.)		Rating	Protective Clothing	DOT (pictograms)
Health 2, Fire Hazard 3, Reactivity 0, Specific hazard	Health Hazard	2*	0 Insignificant		Not evaluated for transport Not evaluated prior to transport
	Fire Hazard	3	1 Slight		
	Reactivity	0	2 Moderate		
	Personal Protection	H	3 High		
			4 Extreme		

Section I. Chemical Product and Company Identification

Product Name	**GASOLINE, UNLEADED**	**Code**	W102E, SAP: 102 to 117
		DSL	See Section 15
Synonym	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or cyed gasoline, Super Premium (94 RO), TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending	**TSCA**	See Section 15
Manufacturer	PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.		

Section II. Composition and Information on Ingredients

Name	CAS #	% (W/W)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
Gasoline	86290-81-5	85-100	300 ppm	500 ppm	Not established
Benzene	71-43-2	<1.5	0.5 ppm	2.5 ppm	Not established

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section III. Hazards Identification.

Potential Health Effects	Flammable liquid. Exercise caution when handling this material. May cause cancer. May cause heritable genetic effects (mutagenicity). This product contains an ingredient or ingredients, which have been shown to cause chronic toxic effects. Contact with this product may cause skin irritation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. For more information refer to Section 11 of this MSDS.

Section IV. First Aid Measures

Eye Contact	Avoid direct contact. Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. Obtain medical advice.
Skin Contact	Avoid direct contact. Wear chemical protective clothing if necessary. As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g., watchbands, belts, etc.). Quickly and gently, blot or brush away excess chemical. Immediately wash with lukewarm, gently flowing water and non-abrasive soap for 15-20 minutes. Immediately obtain medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Quickly transport victim to an emergency care facility.

Continued on Next Page *Internet: www.petro-canada.ca/msds* *Available in French*

Figure 5 – MSDS Sheet – Jet A/A-1 Aviation Turbine Fuel

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	B-3, D-2B, (D-2A)* (See Section 15)		

Section 1. Chemical Product and Company Identification

Product Name	**JET A/A-1 AVIATION TURBINE FUEL**	**Code**	W213, SAP: 149
Synonym	Jet A-1; Jet A-1-DI; Aviation Turbine Kerosene (ATK); JP-8; NATO F-34; Jet F-34; Turbine Fuel, Aviation, Kerosene Type (CAN/CGSB-3.32)	**Validated on**	6/15/2007.
Manufacturer	PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Used as aviation turbine fuel. May contain a fuel system icing inhibitor. In the arctic, Jet A-1 may also be used as diesel fuel and heating oil.		

Section 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (V/V)**	**TLV-TWA(8 h)**	**STEL**	**CEILING**
Complex mixture of petroleum hydrocarbons (C9-C16)**(Kerosene) **Aromatic content is 25% maximum (benzene: nil).	8008-20-6	99.9	200 mg/m³ (***)	Not established	Not established
Fuel System Icing Inhibitor (FSII) (if added*): Diethylene Glycol Monomethyl Ether	111-77-3	0.1-1	Not established	Not established	Not established
Anti-static, antioxidant and metal deactivator additives. *Please note that Jet A-1-DI, JP-8, Jet F-34 and NATO F-34 all contain Fuel System Icing Inhibitor.	Not applicable	<0.1	Not applicable	Not applicable	Not applicable
Manufacturer Recommendation	***Application of this TLV is restricted to conditions in which there are negligible aerosol exposures.				
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.				

Section 3. Hazards Identification.

Potential Health Effects	Combustible liquid. Exercise caution when handling this material. May cause teratogenicity/embryotoxicity. Contact with this product may cause skin irritation. Prolonged or repeated contact may defat and dry skin, and cause dermatitis. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Aspiration of liquid drops into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	Avoid direct contact. Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately obtain medical attention.
Skin Contact	As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g., watchbands, belts, etc.). Avoid direct contact. Wear chemical resistant protective clothing if necessary. Quickly and gently, blot or brush away excess chemical. Immediately wash with lukewarm, gently flowing water and non-abrasive soap for 15-20 minutes. Immediately obtain medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Quickly transport victim to an emergency care facility.

Continued on Next Page *Internet: www.petro-canada.ca/msds* *Available in French*

Figure 6 – MSDS Sheet - Jet B, Aviation Turbine Fuel

PETRO-CANADA

Material Safety Data Sheet

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

Section 1. Chemical Product and Company Identification

Product Name	**JET B AVIATION TURBINE FUEL**	**Code**	W219 SAP: 150, 151, 152
Synonym	Jet B; Jet B DI; JP-4; Jet F-40; NATO F-40; Turbine Fuel, Aviation, Wide Cut Type (Can/CGSB-3.22).	**Validated on**	9/28/2007.
Manufacturer	PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Used as aviation turbine fuel. May contain a fuel system icing inhibitor.		

Section 2. Composition and Information on Ingredients

Name	CAS #	% (W/W)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
Complex mixture of petroleum hydrocarbons (C6-C14).	64741-41-9	60-100	Not established	Not established	Not established
Benzene	71-43-2	0.1-0.5	0.5 ppm	2.5 ppm	Not established
Fuel System Icing Inhibitor (FSII) (if added*): Diethylene Glycol Monomethyl Ether	111-77-3	0.1-0.15	Not established	Not established	Not established
Anti-static, antioxidant, corrosion inhibitor and metal deactivator additives. * Please note that Jet B DI, JP-4, Jet F-40 and NATO F-40 all contain Fuel System Icing Inhibitor (FSII).corrosion inhibitor	Not applicable	<0.1	Not applicable	Not applicable	Not applicable

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Flammable liquid. Exercise caution when handling this material. May cause cancer. May cause teratogenicity/embryotoxicity. Contact with this product may cause skin irritation. Inhalation of vapours can cause irritation of the respiratory tract and CNS depression with symptoms of nausea, headaches, vomiting, dizziness, fatigue, light-headedness, reduced coordination, unconciousness and possibly death. Aspiration into the lungs may produce potentially fatal chemical pneumonitis (fluid in the lungs), severe lung damage, or respiratory failure. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	Avoid direct contact. Quickly and gently blot or brush chemical off the face. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately obtain medical attention.
Skin Contact	As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g., watchbands, belts, etc.). Avoid direct contact. Wear chemical protective clothing if necessary. Quickly and gently, blot or brush away excess chemical. Immediately wash with lukewarm, gently flowing water and non-abrasive soap for 15-20 minutes. Immediately obtain medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Quickly transport victim to an emergency care facility.

Continued on Next Page *Internet: www.petro-canada.ca/msds* *Available in French*

Figure 7 – MSDS Sheet – Aviation Gasoline, 100 LL

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200), Health Canada HPR (SOR/2015-17), and Mexico NOM-018-STPS-2015

SECTION 1: Identification

Product Identifier	**Aviation Gasoline, 100 LL**
Other means of identification	Aviation Gasoline (Billings)
Code	**001769**
MARPOL Annex I Category	Gasoline and Spirits
Relevant identified uses	Fuel
Uses advised against	All others
24 Hour Emergency Phone Number	CHEMTREC: 1-800-424-9300 CHEMTREC México 01-800-681-9531

Manufacturer/Supplier	**SDS Information**	**Customer Service**
Phillips 66 Company	URL: www.phillips66.com/SDS	800-234-6603
P.O. Box 4428	Phone: 800-762-0942	**Technical Information**
Houston, Texas 77210	Email: SDS@P66.com	1-918-977-4224

SECTION 2: Hazard identification

Classified Hazards

H224 -- Flammable liquids -- Category 1
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H336 -- Specific target organ toxicity (single exposure) -- Category 3
H350 -- Carcinogenicity -- Category 1B
H360f -- Reproductive toxicity -- Category 1A
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Hazards Not Otherwise Classified (HNOC)

PHNOC: Electrostatic charge may be generated during pumping and other operations

HHNOC: None known

Label elements

DANGER

Extremely flammable liquid and vapor
Causes skin irritation
May be fatal if swallowed and enters airways
May cause drowsiness or dizziness
May cause cancer
May damage fertility
Toxic to aquatic life with long lasting effects

Obtain special instructions before use; Do not handle until all safety precautions have been read and understood; Keep away from heat/sparks/open flames/hot surfaces. - No smoking; Keep container tightly closed; Ground/bond container and receiving equipment; Use explosion-proof electrical (ventilation and lighting) equipment; Use only non-sparking tools; Take precautionary measures against static discharge; Avoid breathing dust/fume/gas/mist/vapours/spray; Avoid contact during pregnancy/while nursing; Wash skin thoroughly after handling; Use only outdoors or in a well-ventilated area; Avoid release to the environment; Wear protective gloves/protective clothing and eye/face protection; IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician; Do NOT induce vomiting; IF INHALED: Remove person to fresh air and keep comfortable for breathing; IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower; Call a POISON CENTER or doctor/physician if you feel unwell; Take off contaminated clothing and wash before reuse; In case of fire: Use CO_2, dry chemical, or foam for extinction; Collect spillage; Store in a well-ventilated place. Keep container tightly closed; Dispose of contents/container to an approved waste disposal plant

Figure 8 – MSDS Sheet – Stove Oil

Material Safety Data Sheet

STOVE OIL

PETRO-CANADA

1 . Product and company identification

Product name	:	STOVE OIL
Synonym	:	Type 1 Heating Oil, #1 Heating Oil, #1 Furnace Oil, #1 Diesel Fuel, Switch Heater Fuel, Tobacco Curing Oil, Seasonal Furnace Oil, ThermaClean, Economy Diesel, Farm Diesel.
Code	:	W107; SAP: 154
Material uses	:	Stove Oils are distillate fuels suitable for use in liquid fuel burning equipment without preheating.
Manufacturer	:	PETRO-CANADA P.O. Box 2844 150 – 6th Avenue South-West Calgary, Alberta T2P 3E3
In case of emergency	:	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

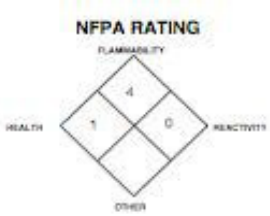
Physical state	:	Bright oily liquid.
Odor	:	Mild petroleum oil like.
WHMIS (Canada)	:	Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). Class D-2B: Material causing other toxic effects (Toxic).
OSHA/HCS status	:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	:	WARNING! COMBUSTIBLE LIQUID AND VAPOR. CAUSES EYE AND SKIN IRRITATION. Combustible liquid. Severely irritating to the skin. Irritating to eyes. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapor or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	:	Dermal contact. Eye contact. Inhalation. Ingestion.
Potential acute health effects		
Inhalation	:	Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Ingestion	:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.
Skin	:	Severely irritating to the skin.
Eyes	:	Irritating to eyes.
Potential chronic health effects		
Chronic effects	:	No known significant effects or critical hazards.
Carcinogenicity	:	No known significant effects or critical hazards.
Mutagenicity	:	No known significant effects or critical hazards.
Teratogenicity	:	No known significant effects or critical hazards.
Developmental effects	:	No known significant effects or critical hazards.
Fertility effects	:	No known significant effects or critical hazards.
Medical conditions aggravated by over-exposure	:	Repeated skin exposure can produce local skin destruction or dermatitis.

Figure 9 – MSDS Sheet – Propane – C3H8

Airgas

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards



PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS:	**PROPANE - C_3H_8** Document Number: 001045
PRODUCT USE:	For general analytical/synthetic chemical uses.
SUPPLIER/MANUFACTURER'S NAME:	AIRGAS INC.
ADDRESS:	259 N. Radnor-Chester Road Suite 100 Radnor, PA 19087-5283
BUSINESS PHONE:	1-610-687-5253
EMERGENCY PHONE:	1-800-949-7937 International: 423-479-0293
DATE OF PREPARATION:	May 12, 1996
REVISION DATE:	February 16, 2001

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Propane	74-98-6	> 96.0	Simple Asphyxiant	NE	1000	NE	2200 (Based on LEL)	NIOSH REL: 1000 ppm DFG MAK: 1000 ppm
Maximum Impurities		<4.0	None of the trace impurities in this mixture contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.