EMERGENCY PLAN

FOR PETROLEUM AND ALLIED PETROLEUM PRODUCTS

— Eureka High Arctic Weather Station —

Prepared by: District 3, Property Management Division
Assets, Contracting and Environmental Management Directorate (ACEMD)
Environment Canada

April 1, 2010

CONTROL PAGE

On receipt of revisions and/or amendments, District 3, Property Management Division shall complete this control page to ensure that the Emergency Plan for Storage Tank Systems of Petroleum and Allied Petroleum Products at Eureka High Arctic Weather Station (HAWS) is always current and consistently reflects the operations and activities taking place on site.

Version	Description / Purpose	Date in Force	Revision Date	Revised By:	Approved By:
1	Original Plan	April 1, 2010			

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ACRONYMS

ACEMD	Assets, Contracting and Environmental Management Directorate
C	Celsius
CCG	Canadian Coast Guard
CEPA	Canadian Environmental Protection Act
CPR	Cardiopulmonary Resuscitation
DSD	Nunavut Department of Sustainable Development
EC	Environment Canada
HAWS	High Arctic Weather Station
INAC	Indian and Northern Affairs Canada
L	Liters
Licence	Nunavut Water Board Licence No. 3BC-EUR0611
M	Meters
MSDS	Material Safety Data Sheets
OSC	On-Scene Commander
PEARL	Polar Environmental Atmospheric Research Lab
PPE	Personal Protective Equipment
PSI	Pounds per square inch
SPM	Station Program Manager
WHMIS	Workplace Hazardous Materials Information System

1. INTRODUCTION

Figure 1: Eureka High Arctic Weather Station, Eureka, NU

1.1 Context

Spills of petroleum and allied petroleum products cannot be entirely prevented; however, the impacts of spills can be minimized by training and establishing a predetermined line of response and action plan. The remoteness of Eureka HAWS coupled with the environmental sensitivity of the region underline the necessity for good spill contingency planning.

This Eureka Petroleum and Allied Petroleum Product Emergency Plan (Plan) applies to the Eureka High Arctic Weather Station (HAWS) located in Eureka, Nunavut. The HAWS is located on the north side of Slidre Fjord, at the northwestern tip of Fosheim Peninsula on Ellesmere Island. HAWS is owned and operated by the Meteorological Service of Canada. Although remote, the Eureka HAWS is a hub of activity for Environment Canada, the Department of National Defence, the Polar Continental Shelf Program, and the Polar Environment Atmospheric Research Lab (PEARL).

The site is accessed primarily by air with an all season air strip located about 1.5 km northeast of the site. An annual sea lift is conducted to provide Eureka HAWS with petroleum products to generate electricity, heat and operate motorized vehicles, pumps, snowmobiles, etc.

1.2 Purpose and Objectives of the Plan

The purpose of the Plan is to provide for a safe, timely, effective and coordinated response by Environment Canada personnel to petroleum and allied petroleum-related spill incidents at Eureka HAWS

The principle objectives of the Plan are to:

1) Protect Environment Canada (EC) employees, other persons working at or visiting Eureka HAWS and the environment by meeting or surpassing all applicable environmental and health and safety legislation, licenses, policies, codes of practice and plans (See Appendix A for the major requirements of the preceding); and
2) Provide detailed information and guidance on actions important for the prevention of spills and procedures to detect and respond to them when they occur.
3) Identify potential emergency situations
4) Minimize the impact of emergencies
5) Continually improve response procedures

2. ADMINISTRATION

2.1 Effective Date of Emergency Plan

April 1, 2010

2.2 Plan Distribution List

This Plan and all subsequent updates shall be issued to (see Appendix B):

1) Environment Canada – Station Program Manager Nunavut;
2) Environment Canada – Head Aerological & Surface Operational Programs Winnipeg, Manitoba;
3) Environment Canada – Manager, District 3 Property Management, Ottawa, Ontario;
4) Environment Canada – Environmental Compliance Officer, Ottawa, Ontario;
5) Department of Environment, Government of Nunavut; and
6) Nunavut Water Board, Gjoa Haven, Nunavut.

2.3 Plan Review and Maintenance

Manager, District 3 Property Management is responsible for the maintenance and update of the Plan.

The Plan shall be reviewed and updated:

1) **Annually**, taking into account changes in the applicable regulatory regimes, environmental factors and any petroleum and allied petroleum-related infrastructural changes at Eureka HAWS; and/or
2) **Following** a spill greater than 100 L; and/or
3) **Following** a spill of any amount that reaches water (DFO Regulation); and/or
4) the identification of any inadequacies in the Plan or in its implementation.

Changes in phone numbers, names of individuals etc. that do not affect the intent of the Plan are to be made on an annual basis. Plan updates shall be made in accordance with the above requirements. With each modification to the Plan, the Control Page shall be update and re-issued as per the Distribution List.

2.4 Response to Media and Public Inquiries

Media inquiries of Eureka or other EC staff concerning petroleum spills at Eureka should be directed to Environment Canada - Media Relations (see Appendix B). The Prairie and Northern Region's Communications Unit will coordinate a response to the inquiries.

3. EUREKA SITE CONDITIONS

This section provides a description of the:

1) Types of petroleum and allied petroleum products at Eureka;
1) Hazards associated with petroleum products;
2) Petroleum and allied petroleum systems at Eureka;
3) Location and maximum expected quantities of the petroleum products or allied petroleum products stored at Eureka at any time during any calendar year; and
4) Characteristics of Eureka and the surrounding area that may increase the risk of harm to the environment or of danger to human life or health.

3.1 Types of Petroleum and Allied Petroleum Products at Eureka

1) Diesel fuel which is used to generate electricity and heat as well as fuel diesel motorized equipment;
2) Gasoline to fuel automobiles, pumps and snowmobiles;
3) Hydraulic fluids, greases, etc. for equipment and vehicles;
4) Aviation Fuel for aircraft;
5) Diesel engine oil for equipment and vehicles;
6) Hydraulic fluids for equipment and vehicles;
7) Glycol for equipment and vehicles; and
8) Petroleum and allied petroleum wastes.

3.2 Hazards of Petroleum Products

Material Safety Development Sheets (MSDS) are provided in Appendix C and Appendix D for diesel and gasoline respectively. These outline in detail the properties of the diesel and gasoline fuel on site at Eureka for the year 2009.

3.3 Description of Eureka's Petroleum and Allied Petroleum Product Systems

3.3.1 Diesel System

Diesel fuel is shipped to Eureka HAWS by a Canadian Coast Guard (CCG) ice breaker. The ice breaker anchors approximately 100 to 300 metres off-shore, and using a floating hose, connects to a land based pipe system to pump the oil to the tank farm (See Appendix E for details).

3.3.2 Gasoline System

Gasoline is brought on shore in 205 L drums. Approximately ten drums are required to fill the 2,273L gasoline tank which is located just south of the tank farm. The average yearly consumption of gasoline is approximately 3,000 L (See Appendix F for details).

3.3.3 Other Petroleum and Allied Products Systems

Much of the barrel petroleum and allied petroleum products that arrive each year on the ice breaker are for agencies/customers other than EC. Further, other than for a few days following the departure of the ice breaker, most of the barrel products are not stored at the EC site but rather on the north apron of the runway near the DND facility. These products include diesel engine oil, solvents, and hydraulic fluids. In addition, there could be up to 4000 barrels of other agencies/customer's aviation fuel.

Finally, EC and other agencies/customers site operations result in Eureka accumulating up to 80 barrels of waste oil and waste aviation fuel which are stored at EC's Petroleum and Allied Petroleum Barrel Storage Area.

3.4 Location of Petroleum and Allied Petroleum Products and Systems at Eureka

The location of Eureka's petroleum and allied petroleum products are identified in Figure 2.

Legend

1: *Transmitter Tank EC-00001195*
2: *Barrel Storage Area*
3: *Tank Farm EC-00001218*
4: *Diesel Dispenser*
5: *Gasoline Tank EC-00001251*
6: *Incinerator Tank EC-00001214*
7: *Warehouse Tank EC-00001146*
***8**: Maintenance Tank EC-00001212*

Figure 2: Location of Eureka's Petroleum and Allied Petroleum Products

3.5 Diesel and Gasoline Tank Systems at Eureka, HAWS

Table 1 documents the characteristics of Eureka's, HAWS diesel and gasoline tank systems.

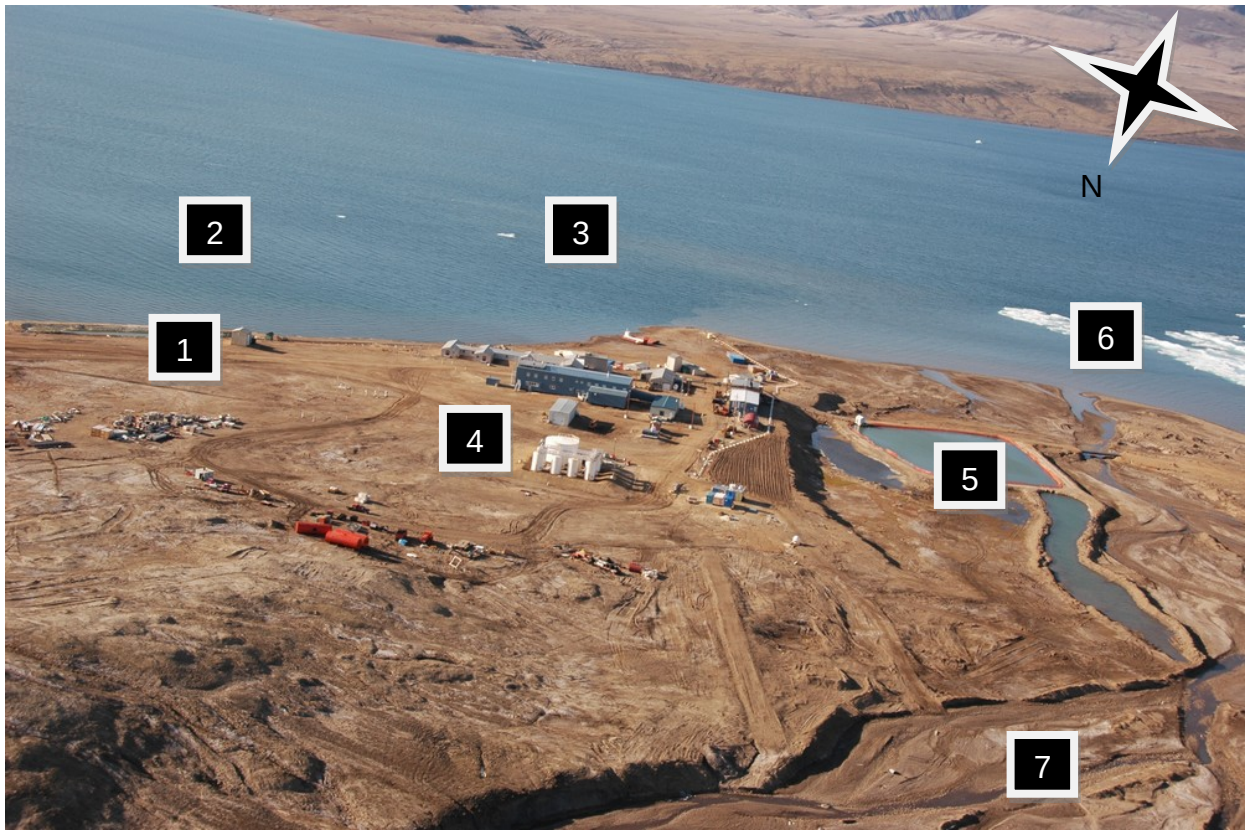
Table 1: Volumes and locations of tanks containing petroleum materials

EC Registration Number	Fuel	Tank Storage Volume	Number of Tanks	Containment Type	Maximum Tank Capacity*	Storage Location and Uses
EC-00001218	Diesel Fuel	770,000 L	1	Single-Walled Tank with impermeable liner and berm (110%)	693,000 L	Tank Farm
EC-00001218	Diesel Fuel	60,000 L	9	Single-Walled Tanks with impermeable liner and berm	54,000 L x 9	Tank Farm
EC-00001195	Diesel Fuel	9,000 L	1	Double-Walled Tank	8,100 L	Transmitter Building, Heating
EC-00001212	Diesel Fuel	9,000 L	1	Double-Walled Tank	8,100 L	Old Maintenance Garage, Heating
EC-00001146	Diesel Fuel	9,000 L	1	Double-Walled Tank	8,100 L	Warehouse, Heating
EC-00001124	Diesel Fuel	9,000 L	1	Double-Walled Tank	8,100 L	Incinerator, Burning
N/A	Diesel Fuel	1,100 L	2	Single-Walled Tanks	990 L x 2	Generator Building, Electrical Generation
N/A	Diesel Fuel	2,273 L	1	Double-Walled Mobile Tank	2,046 L	Employed to transfer diesel to Transmitter Building, Old Maintenance Garage, Warehouse & Incinerator
EC-00001251	Gasoline	2,273 L	1	Double-Walled Tank	2,045 L	South and adjacent to Tank Farm, vehicle fuel, snowmobiles, small generators

*Tanks are only filled to 90% of their capacity to accommodate any possible volume expansion due to a rise in temperature.

3.6 Receptors

There are a number of receptors at Eureka that could be adversely affected by a spill of petroleum or allied petroleum products. Figure 3 illustrates the location of the principle environmental, human and economic receptors at Eureka.



Legend

1: *Sewage Lagoon*
2: *Slidre Fjord*
3: *CCG Ice breaker location*
4: *Buildings*
5: *Freshwater lagoon*
6: *Station Creek delta*
7: *Station Creek*
**Note: Prevailing winds travel W in Aug and NE in Sept.*

Figure 3: Location of environmental, human and economic receptors at Eureka

3.7 Climatic Conditions

The prevailing climatic conditions in Eureka are:

1) Wind – the prevailing wind is from the west during late summer and east for the remainder of the year;
2) Temperatures – well below freezing for the majority of the year (September to July);
3) Snow cover – snow is present for 9-10 months of the year; and
4) Ice – ice conditions are such that only an icebreaker can perform the annual re-supply. Resupply is usually conducted in August or September.

3.8 Topography

The topography at Eureka determines the direction and speed of spilled petroleum and allied petroleum products. Figure 4 illustrates a shallow north to south slope (10 M in 450 M or approximately 2%) in the land from the base of the tank farm to the Fjord and a steep slope of the land just to the west of the pipeline.

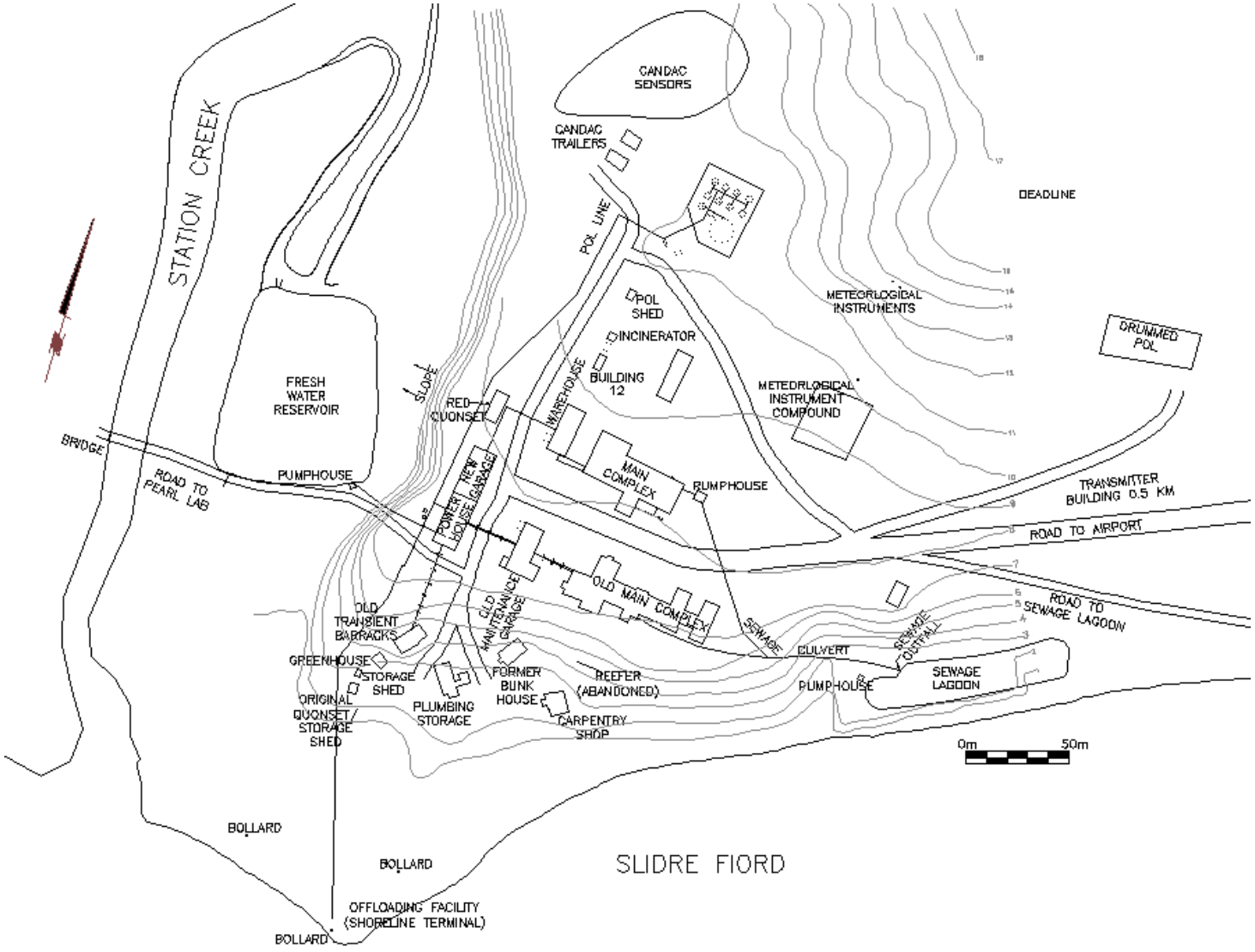
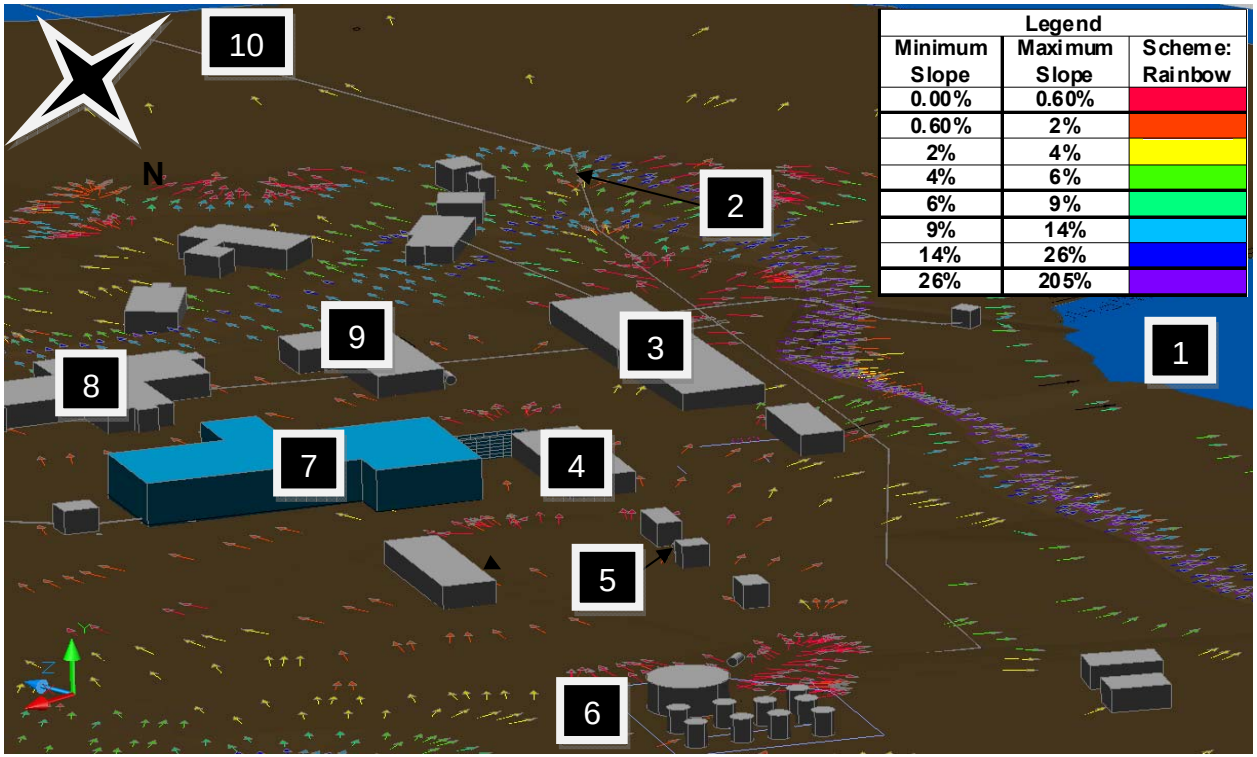


Figure 4: Topographical Map of Eureka

Figure 5 illustrates the Eureka's HAWS topography and direction of flow of possible discharges at Eureka HAWS.



Legend

1: *Freshwater Lagoon*
2: *Pipeline*
3: *Powerhouse*
4: *Warehouse*
5: *Incinerator*
6: *Tank Farm*
7: *Main Complex*
***8**: Old Main Complex*
***9**: Old Maintenance Garage*
***10**: Slidre Fjord*

Figure 5: Topography and flow transport model at Eureka

4. POTENTIAL SPILL SCENARIOS AND ENVIRONMENTAL IMPACTS

4.1 Likelihood of Spills at Eureka

Environment Canada's *Summary of Spill Events in Canada, 1984-1995* provides a review of all spill trends in Canada for the period indicated.

The report has a number of key findings:

1) The top five reasons for spills are equipment failure, human error, corrosion, material failure and storm or flood.
2) The environmental medium most frequently affect by spills is land.
3) The main reported consequences of spills are vegetation and property damage.
4) Fifty-eight percent of the total number of reported spills involved petroleum products.

The likely causes ("what" went wrong) of federal spills are pipe leaks (19% of spills), above-ground tank leaks (15%), container leaks (12%) and overflows (8%). The report recommends material storage as an area in which to focus prevention efforts.
The likely reasons ("why" it went wrong) for spills in the government (all governments) sector are: storm - flood (25%), equipment failure (22%), and human error (10%).

4.2 Overview of Non-Marine Spill Scenarios

Table 2 presents the principle petroleum products stored on site. For each, the table lists potential discharge events with associated discharge volumes and directions. The most likely discharge volume is indicated and the spill clean-up procedures will focus on spills of this quantity. A worst case scenario is also presented. Specific discharge rates are not indicated for each fuel type as these would vary from a few minutes to several hours, based on the source of leak or puncture.

Table 2: List of petroleum materials, potential discharge events, potential discharge volumes and direction of potential discharge

Material (sources)	Potential Discharge Event	Discharge Volume	Possible directions of discharge and susceptible receptors
Diesel	Over filling of portable tank or diesel vehicles from diesel dispenser Leaking pipeline (outside tank farm) to diesel dispenser and motorized valve inside tank farm stuck open	• Likely < 100L • Worst Case ~ 50,000L **(dispenser connected to 60,000L tank)**	Appendix G
	Over filling of 9,000L tanks from portable tank	• Likely: < 100 L • Worst Case: ~ 2000 L **(portable tank contains ~ 2000L)**	Appendix J, (Maintenance Tank) Appendix K (Warehouse Tank) Appendix L (Incinerator Tank)
	Leaking from any of the 10 tanks in Tank Farm	• Likely: < 100L • Possible: > 100 L to < 50,00L • Worst Case: ~ 700,000L **(largest single tank is ~ 700,000 L)**	Appendix G (Tank Farm)
	Leaking from pipeline during sea lift	• Likely: < 100L • Worst Case: ~ 25,000L **{volume of pipe (~ 270 M) between check valve at power house and tank farm}**	Appendix H (North End Pipeline) Appendix I (South End Pipeline)
	Leaking pipeline (outside tank farm) to power house and motorized valve inside tank farm stuck open	• Likely: < 100L • Worst Case: ~ 50,000L **(power house connected to 60,000L tank)**	Appendix H (North End Pipeline)
Gasoline	Over filling of gasoline tank or vehicles south of Tank Farm	• Likely: < 100L • Worst Case: ~ 200L **(volume of gasoline barrel)**	Appendix G (Tank Farm)
Jet A Fuel, Gasoline, Hydraulic Fluid, Glycol, Waste Petroleum	Piercing of 205L barrel	• Likely: < 100L • Worst Case: ~ 200L **(volume of barrel)**	Appendix M (Barrel Storage Area)
	Dropping of pallet of 205L barrels following sea-lift	• Likely < 100L • Worst Case ~ 800L **(pallet of 4 barrels dropped during transport)**	Appendix I (South End Pipeline)

4.3 Potential Impacts of Petroleum and Allied Petroleum Spills

Petroleum and allied petroleum products may be harmful to wildlife and aquatic life. They are not readily biodegradable and have the potential for bioaccumulation in the environment. Diesel burns slowly and thus the risk to the environment is reduced during recovery as burn can be more readily contained compared to a volatile fuel like gasoline.

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

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5. SPILL PREVENTION

Planning for an emergency situation is imperative because of the hazardous nature of the petroleum and allied petroleum materials and the circumstances detailed in sub-section 3.2.

These realities magnify the importance of focusing on preventative measures to minimize the likelihood of a spill in the first place and thereby provide for the safety of Eureka's personnel and the local environment.

5.1 Preventative Measures

5.1.1 Re-supply Measures

Due to the quantity of diesel fuel delivered and its transfer across open water to the shore piping system, the annual bulk transfer by ship offloading poses the greatest risk to the environment at Eureka. The following procedures are currently in place to mitigate the risks of a spill during re-supply:

1) Preliminary inspections of infrastructure before oil transfer operations commence:

    a) Coast Guard confirms that the transfer hose from ship to shore-line has been certified and conducts a pressure test on it.
    b) Coast Guard verifies the integrity of the ships mooring lines.
    c) EC personnel & Coast Guard inspect the pipeline & valves from the shore to the tank farm and review procedures to be implemented for possible spill scenarios.

2) Restrictions on fuel transfer from ship to diesel tank system:

    a) *If no ice in Slidre Fjord.* No transfer of fuel is permitted under the following environmental conditions:

        i) Wind speed greater than 15 knots; and
        ii) Other unacceptable conditions which increase the likelihood of a spill or impede the ability of the oil handling facility to respond in the event of an incident in the judgment of the CCG.

    b) *If light to medium new year ice conditions in Slidre Fjord.* No transfer of fuel is permitted under the following environmental conditions:

        i) Wind speed greater than 10 knots;

ii) Other unacceptable conditions which increase the likelihood of a spill or impede the ability of the oil handling facility to respond in the event of an incident in the judgment of the CCG; and
iii) Should ice flows pose a risk for damage to the floating transfer hose, and such ice flows cannot be easily diverted away from the transfer hose by CCG zodiacs or landing craft, contact will be made immediately to the CCG icebreaker to shut down the transfer of fuel. Upon draining the transfer hose of all fuel, the hose will be disconnected from the ship and will not be reconnected until ice flows do not pose any immediate problems

c) *If heavy new year ice conditions in Slidre Fjord.* No transfer of fuel is permitted under the following environmental conditions:

i) Wind speed greater than 10 knots;
ii) Other unacceptable conditions which increase the likelihood of a spill or impede the ability of the oil handling facility to respond in the event of an incident in the judgment of the CCG; and
iii) Should ice flows pose a risk for damage to the floating transfer hose, and such ice flows cannot be easily diverted away from the transfer hose by CCG zodiacs or landing craft, contact will be made immediately to the CCG icebreaker to shut down the transfer of fuel. Upon draining the transfer hose of all fuel, the hose will be disconnected from the ship and will not be reconnected until ice flows do not pose any immediate problems.

3) Safety measures implemented on-land during diesel fuel transfer

The fuel is delivered to the tank at a pressure of approximately 30 - 80 psi which is well below the pressure capabilities of the hose and pipeline systems.

4) Single diesel tank filling procedure

The annual re-supply is only pumped into the 770,000L storage tank (any residual oil contained within the 770,000 L tank having been conveyed to the other 60,000 L tanks prior to re-supply). This procedure significantly lowers the potential for tank overfills, in that only one tank must be monitored during loading and eliminates a problematic procedure of continually switching from tank to tank during the re-supply process.

5) Monitoring procedures during re-supply

The following individuals are in constant radio contact throughout the approximately 14-24 hour transfer which takes place in August or September:

a) The Captain of the Coast Guard ship;

b) The Captain's Coast Guard counterpart (the Beachmaster) on the beach where the hose from the ship meets the fixed pipeline on land;
c) An EC contract personnel and/or the Beachmaster patrolling the pipeline; and
d) An EC contract personnel and/or the Beachmaster at the 770,000 L tank or any of the 9 - 60,000 L tanks observing the mechanical float level and comparing that observation with a physical measuring of the level of the fuel in the tank by manual dipping. The 770,000 L tank or any of the 9 - 60,000 L tanks are closely monitored during the filling process to ensure there is a minimum of 10% of its capacity remaining to accommodate any possible volume expansion due to a rise in temperature.

5.1.2 Secondary Containment Measures

Secondary containment is provided for all tanks, either in the form of double-walled tanks, or in the case of the tank farm, a berm with high density polyethylene synthetic impermeable liner providing 110% of the capacity of the 770,000 L tank. The berm is inspected yearly and, if necessary, repaired to ensure its integrity.

5.1.3 Regular Monitoring Measures

On a 24/7 basis, EC's site (inside and outside buildings – except the tank farm) is patrolled by EC personnel to monitor, by sight or smell, for fuel leaks.

On a regular basis:

1) The meters on all tanks at the tank farm are read to identify potential leaks;
2) The accuracy of the tank meters is confirmed by lowering a measuring tape to gauge the fuel depth (see Figure 6). This latter reading for each tank is compared to the corresponding tank meter reading to determine if there are any discrepancies;
3) A check is made to confirm that all tank valves are closed except the ones in use;
4) A regular check is made of the motorized valve at the tank farm that opens the pipeline from one of the 60,000 L tank farm diesel fuel tanks to the powerhouse or the dispensing pump when there is a demand for diesel. It is critical that this motorized valve is operational and does not "freeze" in the open position which would cause the previously mentioned sections of the pipeline to be 'charged'. If these sections of the pipeline became damaged while the valve was in the open position, a maximum of 60,000 L tank of diesel could spill onto the land. The motorized valve must be visually checked regularly to ensure the heater is working (no frost on the heater & flag is in right direction indicating valve is off when there is no demand for fuel);
5) All tanks and associated pipelines are checked; and
6) The secondary containment area inside the berm of the tank farm is scrutinized to confirm that are no pools of oil collecting.

Figure 6: Measuring Tank Levels by Dipping

5.1.4 Diesel Fuel Conveyance Safety Measures

Tank Farm diesel is only conveyed via the piping system to the power house/diesel dispenser from 60,000 L tanks. This measure ensures that, if:

1) the motorized valve (discussed above) fails to close, leaving the piping system "charged" and
2) there is a break in the piping system outside the tank farm,

the potential oil spill is limited to ~ 50,000 L and not 700,000 L.

5.1.5 Diesel and Gasoline Dispensing Safety Measures

The nozzles on the diesel dispenser and gasoline tank are constructed with self-serve safety devices to ensure that fuel can only be delivered if a human is present.

5.2 Additional Preventative Initiatives Recently Implemented

For a list of recently initiated preventative measures, see Appendix N.

5.3 Training

Training/instruction will assist in the prevention of petroleum and allied petroleum spills and the mitigation of associated health effects.

5.3.1 General Health and Safety Training

All EC employees and contractors are trained in the following:

1) Workplace Hazardous Materials Information System (WHMIS);
2) First Aid and CPR; and
3) Transportation of Dangerous Goods

A MSDS binder, containing MSDS sheets on all hazardous substances present at Eureka, is located in the front of the vestibule of the main complex. Each building has a MSDS binder containing MSDS sheets for substances contained in that building.

A Workplace Hazardous Materials Information System (WHMIS) manual is located in the front vestibule of the main complex.

Training for employees who may be involved in inspection of fuel tank systems, fuel transfer operations and/or response to a spill is currently being developed. Training will include live exercises.

6. SPILL CONTINGENCY

This section is divided into four sections:

1) Major roles and responsibilities
2) health, safety and environmental measures common to all spill events;
3) responses to a spill in a non-marine environment; and
4) responses to a spill in a marine environment.

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6.1 Major Roles and Responsibilities

6.1.1 Eureka Station Program Manager

The Station Program Manager occupies the pivot role in the operations at Eureka HAWS, in general and a response to a petroleum-related spill, in particular:

1) Gathering personnel and resources and deploying and directing them in stopping, controlling, containing, storing and disposing of the spent petroleum product;
2) Communicating details of the spill to the Spill Response Centre and EC's Manager, District 3 Property Management, if spill > 100 L;
3) Providing medical care to any injured persons;
4) Providing regular updates to ACEMD on containment and cleanup activities; and
5) Completing and submitting a spill report form.

6.1.2 Manager, District 3 Property Management

Upon spill notification, Manager, District 3 Property Management is responsible for public relations, insurance and legal issues relating to an incident, as well as ongoing liaison with other Government Departments and Governments.

In the event that the spill cannot be handled internally, then Manager, District 3 Property Management will request assistance from the Nunavut Government's Department of Sustainable Development (DSD) to provide the appropriate expertise to deal with a large spill at Eureka. In the meantime, Eureka staff will use best efforts to contain and control the spill by deploying its equipment in the spill area. However, once DSD or their contractor arrives on site, they may utilize any equipment currently deployed in addition to any equipment that they may have brought with them.

In the case of a major spill involving potentially large expenditure for cleanup costs and contentious claims from third parties, specialized legal counsel will be consulted. Manager, District 3 Property Management will be responsible for arranging for legal advice

6.2 Spill Response Resources & Equipment

The location of the spill kits is illustrated in Figure 7 below. For a list of all the resources and equipment available to respond to a spill, see Appendix O.

Figure 7: Location of spill kits at Eureka

6.3 Health and Safety Measures

The following health and safety measures apply to both marine and non-marine spill scenarios

6.3.1 Site Control

In the event of a petroleum or allied petroleum product discharge, an immediate assessment shall be made to ensure that the site is secure. Any incident involving spills or leaks can attract curious onlookers, and therefore all non-authorized personnel shall be kept well outside any hazardous area. Only those directly involved in the containment, control or cleanup of the discharge shall be allowed in the general vicinity of the discharge.

6.3.2 Fires

In the event of a fire, fire extinguishers, fire hoses, axes and pull stations can be accessed throughout all major buildings on site.

6.3.3 Slippery Rocks, Decks or Other West Surfaces

Any person working in the vicinity of the shoreline shall wear oil-resistant rubber, steel-toed safety boots.

6.3.4 Working Around Water

All personnel working in close proximity to the water shall wear the appropriate Personal Flotation Devices (PFDs). Persons working on shore do not have to wear PFDs.

6.3.5 Buddy System

A buddy system shall be observed at all times when workers are in the discharge area or working on vessels. Persons shall work within sight of their assigned partner at all times.

6.3.6 Personnel Protective Equipment (PPE) Requirements

The following outlines the personnel protective equipment requirements for Eureka:

1) Selection of outer PPE shall be based on the potential for whole body contact with the product. A potential for repeated contact shall require rain gear (top and bottoms). Clothing shall be kept zippered when handling dangerous materials;
2) Personnel carrying out work where high body-contact with the spilled substance could take place, shall tape the suit over their gloves and boots;
3) Personnel with limited skin contact potential may wear disposable clean guard garments or equivalent. Personnel with no exposure potential (inspectors, monitors, etc.) need not wear protective clothing;
4) All personnel shall wear safety glasses (regular glasses are satisfactory); and
5) Personnel handling contaminated materials shall wear outer chemical resistant gloves. Sleeves shall be taped whenever handling contaminated wet materials.

6.3.7 Protection of Personnel

Any significant spills of volatile products can cause a significant threat to personnel if the vapour plume approaches a populated area. Based on the wind direction a determination of the potential area of impact shall be made and personnel shall be notified of any potential hazard.

6.3.8 Decontamination

In the event of a spill, decontamination stations may be established in the vicinity of a contaminated area. The configuration of the decontamination stations shall be such that the personnel shall pass through one of the stations prior to leaving the contaminated area. If necessary, the stations may be surrounded by a berm and lined with plastic sheeting. Special purpose washing solutions may be placed near the discharge area. All washing solutions shall be clearly marked.

6.3.9 Waste Petroleum and Allied Petroleum Storage

Secondary containment for waste petroleum and allied petroleum products awaiting disposal is provided in the form of salvage drums, crates constructed with plastic lining or secondary containment pallets at the Barrel Storage Area.

In all cases, the disposed material is:

1) Packaged and labelled; and
2) Accompanied by a manifest

in conformity with regulatory requirements (see Appendix A). Copies of manifests are retained and filed at Eureka.

6.4 Non-Marine Spill Response

This section provides:

1) A spill response chart (see Figure 8); and
2) Detailed procedures for responding to non-marine oil spills.

6.4.1 Spill Response Organization & Roles & Responsibilities

The reduction in the number and severity of spills is facilitated by a comprehensive and clearly articulated spill response organization. Figure 8 outlines the flow chart of response in the event of a spill. The details of the roles and responsibilities are explained in the subsequent sub-sections

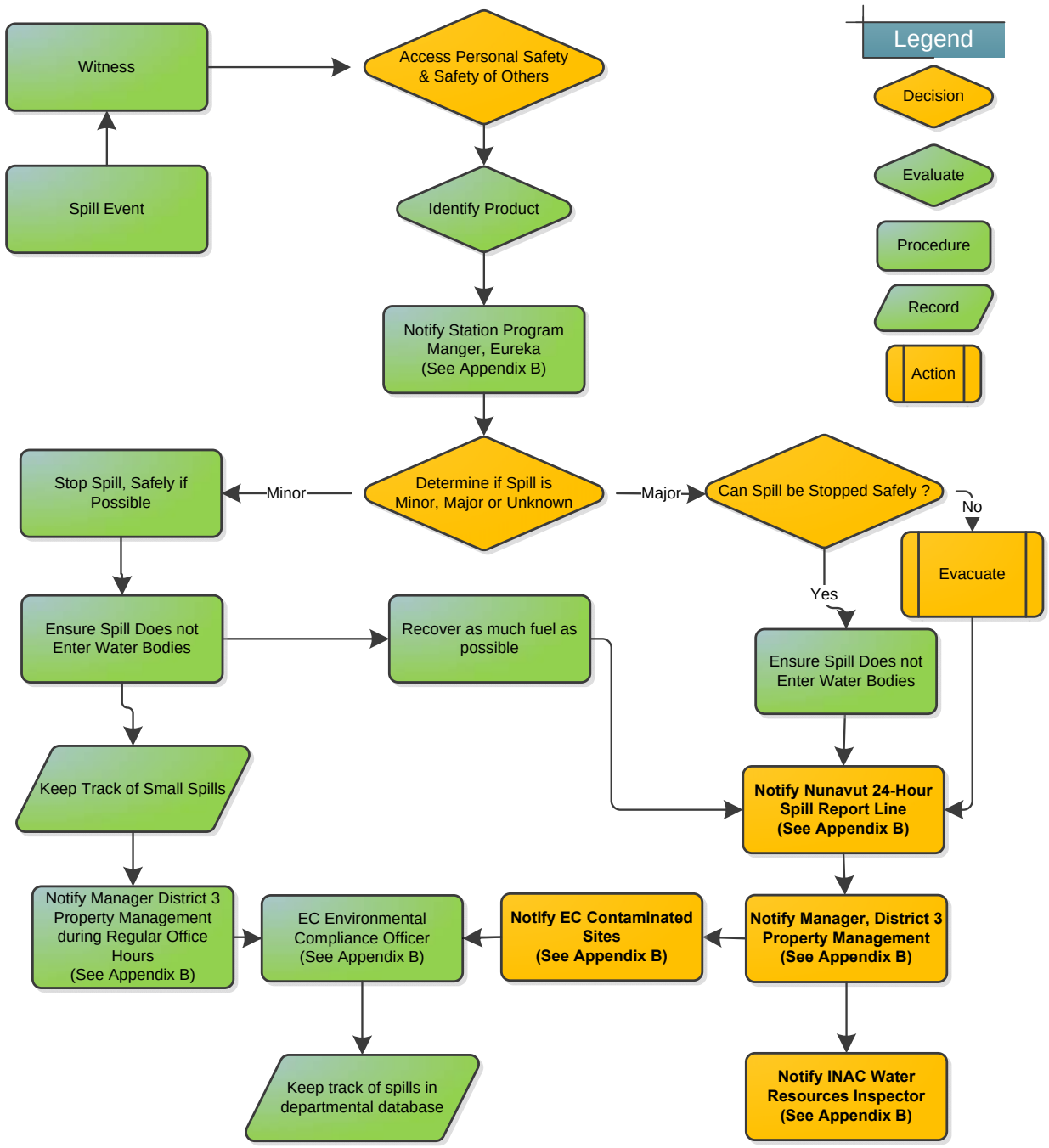

Figure 8: Response Organization for a Non-Marine Petroleum Spill

6.4.2 Procedures for Initial Actions

In the event of a spill, without exception, the health and safety of persons at Eureka is the first priority.

1) Ensure personal safety and that of others.
2) Assess spill hazards and risks.
3) No matter what the volume is, notify Eureka - Station Program Manager. (see Appendix B)
4) Remove all sources of ignition.
5) Stop the spill if safely possible e.g. shut off pump, patch leaking hole. Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so.
6) Tyvek suits and chemical master gloves are located in the spill kit and should be worn immediately if there is any risk of being in contact with fuel.
7) Contain the spill.

6.4.3 Procedures for Spill Reporting

An immediately reportable petroleum spill is defined as a release of greater than 100 L (A spill of any amount must be reported if it affects a body of water). These types of spills must be reported to:

1) The Canada Environmental Emergencies Notification System 24-Hour Spill Report Line - Nunavut (see Appendix B);
2) Environment Canada's Environmental Protection Branch (Yellowknife) (see Appendix B); and
3) The Indian and Northern Affairs Canada Water Resources Inspector (see Appendix B).

Any spills less than this quantity do not need to be reported immediately to the spill reporting line. Rather, these minor spills should be tracked and documented by Eureka and submitted to the Nunavut Water Board in Environment Canada's Annual Report to the Board and to Environment Canada – Environmental Compliance Officer (see Appendix B). If the spill affects a body of water it must be reported to the DFO/CCG Emergency Line (see Appendix B).

If there is any doubt that the quantity spilled exceeds reportable levels, the spill should be reported to the Canada Environmental Emergencies Notification System 24-Hour Spill Report Line - Nunavut (see Appendix B).

See **Appendix B** for all Spill Emergency Telephone Numbers.

Following gaining control and containment of the spill, the Station Program Manager (SPM) must complete and submit the Environment Canada and Nunavut spill report forms (See Appendix P & Appendix Q, respectively).

6.4.4 Procedures for Containing and Controlling the Spill

Initiate spill containment by first determining what will be affected by the spill.

1) Assess speed and direction of spill and cause of movement (water, wind and slope).
2) Determine best location for containing spill, avoiding any water bodies.

6.4.5 Procedures for Containment of Petroleum Products Spilled on Land, Water, Ice and Snow

6.4.5.1 Procedures for Containment of Spills on Land

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.

1) Dykes

Dykes can be created using 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 to a size that will ensure containment of the maximum quantity of fuel that may reach it. A plastic tarp can be placed on and at the base of the dyke such that fuel can pool up and subsequently be removed with sorbent materials 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.

2) Trenches

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

6.4.5.2 Procedures for Containment of Spills on Land that reach a body of water

Spills that reach water such as Station Creek at Eureka 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.

1) Booms

Booms are commonly used to recover fuel floating on the surface of lakes or slow moving streams. 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 than 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.

2) Weirs

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.

3) 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. 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.

6.4.5.3 Procedures for Containment of Spills on Ice

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 shovelled into a plastic bag or barrel. However, all possible attempts should be made to prevent spills from entering ice covered waters as no easy method exists for containment and recovery of spills if they seep under ice.

1) Dykes

Dykes can be used to contain fuel spills on ice. By collecting surrounding snow, compacting it and mounding it to form a dyke down slope of the spill, a barrier is created thus helping to 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 can then be pumped into barrels or collected with sorbent materials.

2) Trenches

For significant spills on ice, trenches can be cut into the ice surrounding and/or down slope of the spill such that fuel is allowed to pool in the trench. It can then be removed via pump into barrels, collected with sorbent materials, or mixed with snow and shovelled into barrels or bags.

3) Burning

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

6.4.5.4 Procedures for Containment of Spills on Snow

Snow is a natural sorbent, thus as with spills on soil, spilled fuel can be more easily recovered. Generally, small spills on snow can be easily cleaned up by raking and shovelling the contaminated snow into plastic bags or empty barrels, and storing these at an approved location.

1) 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 thus helping to 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.

6.4.5.5 Procedures for Transferring, Storing and Managing Petroleum Spill Wastes

In most cases, spill cleanups are initiated at the far end of the spill and contained moving toward the centre of the spill. Sorbent socks and pads are generally used for small spill cleanup. A pump with attached fuel transfer hose can suction spills from leaking containers or large accumulations on land or ice, and direct these larger quantities into empty drums. Hand tools such as cans, shovels, and rakes are also very effective for small spills or hard to reach areas. Heavy equipment can be used if deemed necessary, and given space and time constraints.

Used sorbent materials are to be placed in plastic bags for future disposal. All materials mentioned in this section are available in the spill kits located at Eureka. Following clean up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible.

For most of the containment procedures outlined above, spilled petroleum products and materials used for containment will be placed into empty waste oil containers and sealed for proper disposal at an approved disposal facility.

6.5 Marine Spill Response (During Resupply)

This section of the Plan is designed to enable Eureka personnel to be prepared for and respond to marine based spills of diesel fuel at Eureka HAWS during the annual sea lift operation.

6.5.1 Spill Response Organization & Roles & Responsibilities

The reduction in the number and severity of spills is facilitated by a comprehensive and clearly articulated spill response organization. Figure 9 outlines the flow chart of response in the event of a marine spill.

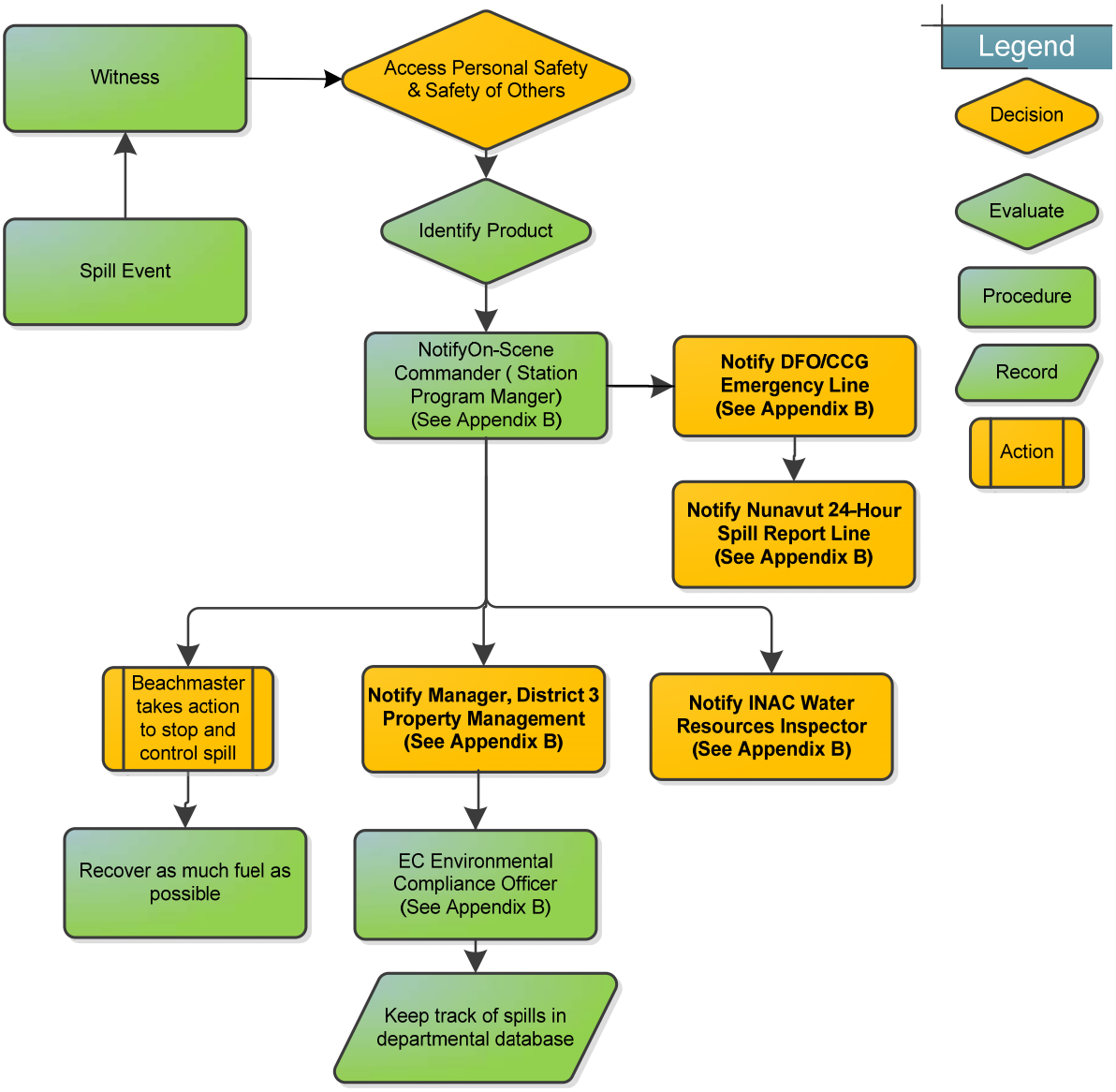

Figure 9: Response Organizations for a Marine Petroleum Spill

6.5.2 Steps Initiated Prior to Arrival of Coast Guard Ship

1) All of the equipment (see Appendix O) is pre-staged and ready for deployment prior to the CCG icebreaker's arrival
2) The containment boom is stored in a shack located on the shore edge to allow for quick deployment onto the water by CCG water craft.
3) Tow lines connected to either end of the boom will allow CCG water craft to connect to the boom and encircle a spill and direct it away from sensitive areas
4) Pipeline from shore to Tank Farm has been pressure tested

5) Any oil remaining in the 770,000 L tank has been transferred to other tanks within the Tank Farm

6.5.3 Steps Initiated Following Arrival of Coast Guard Ship

1) The Beach Master assumes control of the transfer operation and has full authority to stop the operation if he deems it unsafe for any reason and is expected to take such action
2) There are sufficient personnel on site to manage the transfer operation and any subsequent oil pollution incident

6.5.4 Steps Initiated Following a Marine Spill Incident

The health and safety of persons at Eureka is the first priority

1) In the event of a marine oil pollution incident, the Station Program Manager assumes the responsibility of the On-Scene Commander (OSC) and will request the Beach Master to immediately take action to contain or control the released product as quickly as possible providing this can be done safely.
2) Ensure personal safety and that of others.
3) Assess spill hazards and risks.
4) No matter what the volume is, notify Eureka – Station Program Manager (see Appendix B); and
5) Remove all sources of ignition.
6) Stop the spill if safely possible e.g. shut off pump, patch leaking hole. Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so.
7) Tyvek suits and chemical master gloves are located in the spill kit and should be worn immediately if there is any risk of being in contact with fuel.
8) Contain the spill.
9) Determine the direction of any winds. If from the east, the following actions should be initiated to protect the Arctic Tern nesting grounds located at the delta approximately 200 M west of the connection of the floating transfer hose to the shore side pipeline:
    a. Scare any birds in the area
    b. If containment of the spill is ineffective, the boom should be relocated to protect the shoreline along the delta

6.5.5 Procedures for Containing and Controlling the Spill

1) Beachmaster will contact the icebreaker immediately to shut down the transfer of fuel.
2) Onshore valves will be immediately closed to prevent any back flow from the pipeline in the event the check valve fails.
3) Area will be secured.

4) CCG will deploy the containment booms downwind and down current to contain the spilled fuel.
5) If deployment of the containment boom is unsafe, ineffective or impractical the fuel spill will be dispersed into deep water by high pressure water hoses from the CCG ship for natural dissipation.
6) If the containment is ineffective, the boom will be relocated to protect the shoreline along the delta.
7) Attempt will be made to adsorb as much of the spill as possible by skimming the water surface with the sorbent booms and soaking up the remainder of the spill with absorbent rolls

6.5.6 Procedures for Spill Reporting

An immediately reportable petroleum spill on water is defined as a release of any amount. It must be reported to:

1) Canada Environmental Emergencies Notification System 24-Hour Spill Report Line - Nunavut (see Appendix B);
2) Environmental Protection Branch (Yellowknife) (see Appendix B);
3) Department of Fisheries and Oceans/Canadian Coast Guard Emergency Line (see Appendix B)

Spills should be tracked, documented and submitted to the Nunavut Water Board in Environment Canada's Annual Report to the Board and to the Environment Canada – Environmental Compliance Officer (see Appendix B).

See Appendix B for Emergency Spill Telephone Numbers.

Following gaining control and containment of the spill, the Station Program Manager must complete and submit the Environment Canada and Nunavut spill report forms (See Appendix P & Appendix Q, respectively).

6.6 Procedures for Transferring, Storing and Managing Petroleum Spill Wastes

Sorbent socks and pads are generally used for small spill cleanup. A pump with attached fuel transfer hose can suction spills from leaking containers or large accumulations on land or ice, and direct these larger quantities into empty drums. Hand tools such as cans, shovels, and rakes are also very effective for small spills or hard to reach areas. Heavy equipment can be used if deemed necessary, and given space and time constraints.

Used sorbent materials are to be placed in plastic bags for future disposal. All materials mentioned in this section are available in the spill kits located at Eureka. Following clean up, any tools or equipment used will be properly washed and decontaminated, or replaced if this is not possible.

For most of the containment procedures outlined above, spilled petroleum products and materials used for containment will be placed into empty waste oil containers and sealed for proper disposal at an approved disposal facility.

6.7 Procedures for Restoring Affected Areas

Once a spill has been contained it will be managed according to the Environment Canada's *Summary of Operations And Maintenance Procedures For Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities – Eureka High Arctic Weather Station, 2009. Environment Canada – Environmental Programs, Contaminated Sites should be* consulted for advice (see Appendix B)
.

6.8 Procedures for Disposal

Petroleum products collected from spill events are sent by sealift to Safety-Kleen (Quebec) Ltd.,85 rue de Hambourg, Saint-Augustin-de Desmaures, QC G3A 1S6.

Waste glycol is sent by sealift to Safety-Kleen (Quebec) Ltd.

APPENDIX A: FEDERAL AND TERRITORIAL LEGAL AND POLICY REQUIREMENTS

Environmental, Health & Safety Legislation, Policies, Agreements, etc.	Major Provisions	Reference
Federal Legislation		
Canada Occupational Health and Safety Regulation, Part X – Hazardous Substances	• Records of hazardous substances • Hazard investigation • Storage, handling & use • Warnings of hazardous materials • Employee education • Control of hazards	http://www.canlii.org/en/ca/laws/regu/sor-86-304/latest/sor-86-304.html#PART_X_HAZARDOUS_SUBSTANCES_415404
Canada Shipping Act	• Response Measures (s.180) • Requirements of Oil Handling Facilities (s.168)	http://www.tc.gc.ca/media/documents/acts-regulations/C-10.15-acts.pdf
Canadian Environmental Protection Act (Part 8) (CEPA)	• Petroleum is a hazardous substance • Reporting of spills • Remedial measures	http://laws.justice.gc.ca/eng/C-15.31/page-7.html#anchorbo-ga:l_9-gb:s_212
Controlled Products Regulations	• MSDS • Labels • Classes of controlled products	http://laws.justice.gc.ca/en/H-3/SOR-88-66/index.html
Environmental Emergency Regulations	• Waste information • Emergency environmental plan	http://www.ec.gc.ca/ee-ue/Default.asp?lang=En&n=E3A506F8-1
Environmental Enforcement Act	Once it is in force • Penalties for environmental offences • liabilities and duties of corporate directors and officers	Not presently on-line
Export and Import of Hazardous Wastes Regulations	• Release of substances • List of toxic substances	http://laws.justice.gc.ca/eng/C-15.31/index.html
Fisheries Act	• Prohibitions • Duties of persons handling hazardous waste	http://laws.justice.gc.ca/en/showdoc/cs/F-14/bo-ga:s_78/20090730/en#anchorbo-ga:s_78
Hazardous Products Act	• Designates diesel and gasoline as hazardous products	http://laws.justice.gc.ca/en/H-3/
Interprovincial Movement of Hazardous Waste Regulations	• Manifests	http://www.canlii.org/en/ca/laws/regu/sor-2002-301/latest/sor-2002-301.html
Migratory Birds Convention Act	• Prohibitions	http://laws.justice.gc.ca/eng/M-

Environmental, Health & Safety Legislation, Policies, Agreements, etc.	Major Provisions	Reference
		7.01/page-3.html#anchorbo-ga:s_5
Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations	• S.30-31 • Technical standards related to tank systems holding petroleum or allied petroleum products • Emergency Plan Requirements	http://www.ec.gc.ca/st-rs/default.asp?lang=En&n=06EF27CF-1
Transportation of Dangerous Goods Act and Regulations	• Transport manifest • Identify & classify waste • Packaging • Labelling	http://www.tc.gc.ca/tdg/clear/tofc.htm
Nunavut Water Board Licence No. 3BC-EUR0611	• Part H • Requirement for a Spill Contingency Plan • Plan requirements	On File
Nunavut Legislation		
Safety Act (Nunavut)	• Safety duties of employers • Safety duties of employees • Powers and duties of safety operators	http://www.wcb.nt.ca/your_wcb/Legislation/Safety%20Act%20-%20Nunavut.pdf
Spill Contingency Planning and Reporting Regulations (Nunavut)	• Requirement for a Spill Contingency Plan • Spill Report Form	http://www.canlii.org/en/nt/laws/regu/nwt-reg-068-93/latest/nwt-reg-068-93.html
Work Site Hazardous Materials Information System Regulations (Nunavut)	• Worker education • Hazardous material labels	http://www.wcb.nt.ca/your_wcb/Legislation/Work_Site_Hazard_Mater_Info_Syst.pdf
Federal Policy		
Environment Canada's Sustainable Development Strategy 2007-2009	• EC Commitments	http://www.ec.gc.ca/sd-dd_consult/PDF/DPR2007Table_eng.pdf
Codes of Practice/Guidelines		
Canadian Labour Code II	• Duties of employer • Duties of employees	http://laws.justice.gc.ca/en/L-2/
Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products	• Registration and approval of tank systems • Design and installation • Monitoring and leak detection • Operation and maintenance • Withdrawal of systems	https://secure.encryptedtransactions.com/dfocus/ccme/eng/detail.cfm?sku=CCM-2017-00-00-0&selectedCat=CCM-CON-
National Building Code	• Safety • Health • Accessibility • Fire and Structural Protection of Buildings	http://www.nationalcodes.ca/nbc/index_e.shtml

Environmental, Health & Safety Legislation, Policies, Agreements, etc.	Major Provisions	Reference
National Fire Code	• Safety • Health • Fire Protection of Buildings and Facilities	http://www.nationalcodes.ca/nfc/index_e.shtml
Technical Guidelines for Above Ground Storage Tank Systems that contain Petroleum Products and Allied Petroleum Products	• Regulatory requirements • Timelines for existing systems • Leak detection & monitoring • Record keeping	http://www.ec.gc.ca/st-rs/default.asp?lang=En&n=400DB49F-1
Implementation Guidelines for Part 8 of the Environmental Protection Act 1999 – Environmental Emergency Plans	• Emergency reporting requirements • Compliance and enforcement	http://www.ec.gc.ca/CEPARegistry/guidelines/impl_guid/toc.cfm

APPENDIX B: SPILL EMERGENCY TELEPHONE NUMBERS

EUREKA EMERGENCY CONTACTS & TELEPHONE #'s

CONTACT	Telephone Numbers
Medical Assistance	
Nurse (Resolute Bay)	(867) 252-3844
Doctor (Iqaluit Hospital)	(867) 979-5306
Medical Evacuation, Kenn Borek Air (Resolute)	(867) 252-3845
Spill Reporting Centers	
Canada Environmental Emergencies Notification System 24-Hour Spill Report Line - Nunavut	(867) 920-8130
Department of Fisheries and Oceans/Canadian Coast Guard Emergency Line	1-800-565-1633
National Environmental Emergency Centre	(819) 997-3742 or 1-866-845-6037
Environmental Protection Branch (Yellowknife)	Working Hours (867) 669-4700 After Working Hours (867) 920-5131
Federal	
Environment Canada – Station Program Manager, Eureka, NU	(613) 945-3145 Ext: 4460
Environment Canada – Head Aerological & Surface Operational Programs, Winnipeg, MB	(204) 984-4385
Environment Canada – Manager, District 3 Property Management, Ottawa, ON	(613) 949-8555
Environment Canada – Environmental Compliance Officer, Environmental Programs, Property Management Division, Ottawa, ON	(613) 949-1795
Environment Canada – Environmental Programs, Contaminated Sites	(613) 949-7699
Nunavut Water Board, Gjoa Haven, NU	(867) 360-6338
Prairie Weather Centre Shift Supervisor	(204) 983-4513
Indian & Northern Affairs Canada, Iqaluit, NU	(867) 669-2761
Indian and Northern Affairs Canada Water Resources Inspector	(867) 975-4298
HRSDC (Human Resources and Skills Development Canada)	Working Hours1-866-713-4397 After Working Hours 1-866-713-4397

Territorial	
Department of Environment, Government of Nunavut	(867) 975-5900
Eureka	
DND (Eureka)	(613) 945-3145 (Ext: 4469 or 4450)
Polar Continental Shelf Program - Resolute	(867) 252-3872
Polar Environment Atmospheric Research Lab	(716) 803-6470 Ext: 100
Media & Public Enquiries	
Environment Canada - Media Relations	1-888-908-8008 or media@ec.gc.ca
Prairie & Northern Region's Communications Unit	(780) 951-8721

APPENDIX C: 2009 MSDS SHEETS FOR DIESEL STORED IN EUREKA'S STORAGE TANK SYSTEM

A MSDS binder, containing MSDS sheets on all hazardous substances present at Eureka, is located in the front of the vestibule of the main complex. Each building has a MSDS binder containing MSDS sheets for substances contained in that building.

LOW SULPHUR DIESEL CP-43 320-043
Revision Number: 01

Les Petroles Therrien inc.

Material Safety Data Sheet

Effective Date: 2009-09-02
Supersedes: 2006-04-27

Class B3 Combustible Liquid

Class D2B Other Toxic Effects - Skin Irritant

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT:	**LOW SULPHUR DIESEL CP-43**
SYNONYMS:	Diesel Automotive Gas Oil
PRODUCT USE:	Fuel Solvent
MSDS Number:	320-043

MANUFACTURER
Les Pétroles Therrien inc.
P.O. Box 428
1000, Lemire Boulevard
Drummondville, QC Canada
J2B 8G6

TELEPHONE NUMBERS

Petro-T Emergency Number	1-800-567-8213
For general information:	(819) 474-2626
For MSDS information:	(819) 474-2626

This MSDS was prepared by the Toxicology and Product Stewardship Section of Petro-T inc.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Fuels, Diesel, No. 2	68476-34-6	100	Yes

See Section 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Physical Description: Liquid Clear To Yellow Hydrocarbon Odour

Routes of Exposure: Exposure will most likely occur through skin contact or inhalation.
Hazards:

Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Combustible Liquid.
Irritating to skin.
Vapours are moderately irritating to the eyes.
Ingestion may result in vomiting. Avoid aspiration of vomitus into lungs as small quantities may result in aspiration pneumonitis.
Vapours are moderately irritating to the respiratory passages.

Handling: Eliminate all ignition sources.
Avoid prolonged exposure to vapours.
Wear suitable gloves and eye protection.
Bond and ground transfer containers and equipment to avoid static accumulation.
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

4. FIRST AID

Eyes: Flush eyes with water for at least 15 minutes while holding eyelids open. If irritation occurs and persists, obtain medical attention.

Skin: Wash contaminated skin with mild soap and water for 15 minutes. If irritation occurs and persists, obtain medical attention.

Ingestion: DO NOT INDUCE VOMITING! OBTAIN MEDICAL ATTENTION IMMEDIATELY. Guard against aspiration into lungs by having the individual turn on to their left side. If vomiting occurs spontaneously keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.

Inhalation: Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

Notes to Physician: The main hazard following accidental ingestion is aspiration of the liquid into the lungs producing chemical pneumonitis. If more than 2.0 mL/kg has been ingested, vomiting should be induced with supervision. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before vomiting, gastric lavage with a cuffed endotracheal tube should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Dry Chemical
Carbon Dioxide
Foam
Water Fog

Firefighting Instructions: Caution - Combustible. Do not use a direct stream of water as it may spread fire. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Vapours may travel along ground and flashback along vapour trail may occur. Avoid inhalation of smoke. Product will float and can be reignited on surface of water. Delayed lung damage can be experienced after exposure to combustion products, sometimes hours after the exposure.

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

6. ACCIDENTAL RELEASE MEASURES

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

7. HANDLING AND STORAGE

Handling: Combustible. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep container tightly closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

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

Diesel fuel, as total hydrocarbons: 100 mg/m3
Skin Notation: Absorption through skin, eyes and mucous membranes may contribute significantly to the total exposure.

Mechanical Ventilation: Concentrations in air should be maintained below the recommended threshold limit value if unprotected personnel are involved. Use explosion-proof ventilation as required to control vapour concentrations. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit.

PERSONAL PROTECTIVE EQUIPMENT:

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

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

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

9. PHYSICAL DATA

Physical State:	Liquid
Appearance:	Clear To Yellow
Odour:	Hydrocarbon Odour
Odour Threshold:	Not available
Freezing/Pour Point:	Cloud Point-43 °C
Boiling Point:	150 - 330 °C
Density:	< 850 kg/m3 @ 15 °C
Vapour Density (Air = 1):	Not available
Vapour Pressure (absolute):	Not available
pH:	Not available
Flash Point:	Pensky-Martens CC > 40 °C
Lower Explosion Limit:	1 % (vol.)
Upper Explosion Limit:	6 % (vol.)
Autoignition Temperature:	250 °C
Viscosity:	1.3 - 2.1 cSt @ 40 °C
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (log K_{ow}):	Not available
Water Solubility:	Insoluble
Other Solvents:	Hydrocarbon Solvents

10. STABILITY AND REACTIVITY

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes

Hazardous Decomposition Products:	Thermal decomposition products are highly dependent on combustion conditions.
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources.

11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	**Toxicological Data**
Fuels, Diesel, No. 2	LD50 Dermal Rabbit > 5000 mg/kg LD50 Oral Rat = 9000 mg/kg

Routes of Exposure:	Exposure will most likely occur through skin contact or inhalation.
Irritancy:	This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.
Acute Toxicity:	Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Chronic Effects:	Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression.
Pre-existing Conditions:	Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.
Carcinogenicity and Mutagenicity:	The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk. The American Conference of Governmental Industrial Hygienists (ACGIH) has classified this product as A3 - confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL INFORMATION

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

Biodegradability:	Not readily biodegradable.
Bioaccumulation:	Potential for bioaccumulation.
Partition Coefficient (log K_{ow}):	Not available

Aquatic Toxicity

May be harmful to aquatic life.

Ingredient:	**Toxicological Data**
Fuels, Diesel, No. 2	EL50 - growth rate Algae (72hr) 10 - 100 mg/L. EL50 Daphnia Magna (48hr) 10 - 100 mg/L. LL50 (WAF method) Rainbow Trout (96hr) 10 - 100 mg/L.

Definition(s): LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances.
WAF is the water accommodated fraction. A slightly soluble hydrocarbon is stirred into water and the insoluble portions are removed. The remaining solution is the water accommodated fraction.

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

Canadian Road and Rail Shipping Classification:

UN Number	UN1202
Proper Shipping Name	DIESEL FUEL
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG III
Additional Information	Not Regulated in Containers Less Than or Equal to 450 Litres.
Shipping Description	DIESEL FUEL Class 3 UN1202 PG III Not Regulated in Containers Less Than or Equal to 450 Litres.

15. REGULATORY INFORMATION

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

WHMIS Class:	Class B3 Combustible Liquid Class D2B Other Toxic Effects - Skin Irritant
DSL/NDSL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act.
Other Regulatory Status:	No Canadian federal standards.

16. ADDITIONAL INFORMATION

LABEL STATEMENTS

Hazard Statement :	Combustible Liquid. Irritating to skin.
Handling Statement:	Eliminate all ignition sources. Avoid prolonged exposure to vapours. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.
Revisions:	This MSDS has been reviewed and updated. Changes have been made to: Section 1 Section 3 Section 5 Section 8 Section 9 Section 12

APPENDIX D: 2009 MSDS SHEETS FOR GASOLINE STORED IN EUREKA'S STORAGE TANK SYSTEM

A MSDS binder, containing MSDS sheets on all hazardous substances present at Eureka, is located in the front of the vestibule of the main complex. Each building has a MSDS binder containing MSDS sheets for substances contained in that building.

Material Safety Data Sheet

PETRO-CANADA

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

Section 1. Chemical Product and Company Identification

Product Name	**GASOLINE, UNLEADED**	**Code**	W102E, SAP: 102 to 117
Synonym	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, Super Premium (94 RO), TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending	**Validated on**	**5/14/2008.**
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 2. Composition and Information on Ingredients

			Exposure Limits (ACGIH)		
Name	**CAS #**	**% (W/W)**	**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 3. 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 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 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.
Ingestion	NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 60 to 240 mL (2 to 8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. 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*

Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Flammable liquid (NFPA).	**Flammable Limits**	Lower: 1.3%; Upper: 7.6% (NFPA).
Flash Points	Closed cup: -50 to -38°C (-58 to -36.4°F) [Tagliabue]	**Auto-Ignition Temperature**	257°C (495°F) (NFPA).
Fire Hazards in Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), polynuclear aromatic hydrocarbons, phenols, smoke and irritating vapours as products of incomplete combustion. See Section 11 (Other Considerations) for information regarding the toxicity of the combustion products.		
Fire Fighting Media and Instructions	NAERG2004 GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a very low flash point: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

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

Section 7. Handling and Storage

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

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection	- ***The selection of personal protective equipment varies, depending upon conditions of use.***
Eyes	As a minimum, safety glasses with side shields should be worn when handling this material.
Body	If this material may come in contact with the body during handling and use, we recommend wearing appropriate protective clothing to prevent contact with the skin. (Contact your PPE provider for more information.)
Respiratory	A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

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Hands	If this material may come in contact with the hands during handling and use, we recommend wearing gloves of the following material(s): polyvinyl alcohol (PVA), fluoro-elastomer. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.	**Viscosity**	Not available.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.	**Pour Point**	Not applicable.
Odour	Gasoline	**Softening Point**	Not applicable.
Odour Threshold	Less than 1 ppm.	**Dropping Point**	Not applicable.
Boiling Point	25 to 220°C (77 to 428°F) (ASTM D86)	**Penetration**	Not applicable.
Density	0.685 - 0.80 kg/L @ 15°C (59°F).	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	3 to 4 (Air = 1) (NFPA).	**Ionicity (in water)**	Not available
Vapour Pressure	<107 kPa @ 37.8°C (100°F)	**Dispersion Properties**	Not available
Volatility	Volatile.	**Solubility**	Hydrocarbon components virtually insoluble in water. Soluble in alcohol, ether, chloroform, and benzene. Dissolves fats, oils and natural resins.

Section 10. Stability and Reactivity

Corrosivity	Non corrosive.		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents and acids.	**Decomposition Products**	May release COx, NOx, phenols, polynuclear aromatic hydrocarbons, smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Gasoline (8006-61-9): Acute Oral toxicity (LD50): 13600 mg/kg (rat) Acute Dermal toxicity (LD50): >5000 mg/kg (rabbit) Benzene (71-43-2): Acute Oral toxicity (LD50): 930 mg/kg (rat) Acute Dermal toxicity (LD50): >9400 mg/kg (rabbit) Acute Inhalation toxicity (LC50): 13229 ppm/4h (rat)
Chronic or Other Toxic Effects	
Dermal Route:	Contact may cause skin irritation. Prolonged or repeated contact may defat and dry skin, and cause dermatitis.
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Eye Irritation/Inflammation:	Short-term exposure is expected to cause only slight irritation, if any.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product contains a component(s) at >= 0.1% that has been shown to cause mutagenicity in laboratory tests. Therefore, this product is considered to be a mutagen. (Benzene)

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Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be A1 by the ACGIH. Benzene (71-43-2)] [Considered to be A3 by the ACGIH. Gasoline (8006-61-9)]
Carcinogenicity (IARC):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be carcinogenic to humans (group 1) by IARC. Benzene (71-43-2)] [Considered to be carcinogenic to humans (group 2B) by IARC. Gasoline (8006-61-9)]
Carcinogenicity (NTP):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Known to be a human carcinogen according to NTP. Benzene (71-43-2)]
Carcinogenicity (IRIS):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be carcinogenic by IRIS. Benzene (71-43-2)]
Carcinogenicity (OSHA):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be carcinogenic by OSHA. Benzene (71-43-2)]
Other Considerations	Gasoline engine exhaust is possibly carcinogenic to humans (IARC Group 2B).

Section 12. Ecological Information

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

Section 13. Disposal Considerations

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

Section 14. Transport Information

TDG Classification	GASOLINE, 3, UN1203, PGII (CL-TDG)	**Special Provisions for Transport**	See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations	This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List). All components of this formulation are listed on the US EPA-TSCA Inventory. All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS). This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR. Please contact Product Safety for more information.		
DSD/DPD (Europe)	Not evaluated.	**HCS (U.S.A.)**	CLASS: Contains material which may cause cancer. CLASS: Flammable liquid having a flash point lower than 37.8°C (100°F). CLASS: Irritating substance. CLASS: Target organ effects.
ADR (Europe) (Pictograms)	NOT EVALUATED FOR EUROPEAN TRANSPORT NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.	**DOT (U.S.A) (Pictograms)**	Not evaluated for transport Non évalué pour le transport

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

Section 16. Other Information

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

Glossary

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

For Copy of MSDS
Internet: www.petro-canada.ca/msds

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

For Product Safety Information: (905) 804-4752

Prepared by Product Safety - JDW on 5/14/2008.

Data entry by Product Safety - JDW.

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

APPENDIX E: EUREKA'S DIESEL FUEL SYSTEM

Prior to the annual arrival of the CCG ice breaker, any remaining diesel in the 770,000 L tank is pumped to one or more of the 9 x 60,000 L tanks. Diesel fuel is then conveyed to the tank farm from the CCG ice breaker via the piping system to the 770,000 L tank. If there is still excess capacity in the 60,000 L tanks, diesel will be pumped into those tanks from the 770,000 tank and the 770,000 L tank will then be filled to tank capacity. Approximately 500,000 - 900,000 L of diesel are conveyed to Eureka's tank farm each year.

Only the 60,000 L tanks deliver fuel. When a 60,000 L tank is emptied, it is filled by gravity feed from the 770,000 L tank. From the 60,000 L tanks, it travels to:

1) Two tanks at the generator building (via pipeline; and
2) The diesel dispenser (just south of the tank farm) where it is pumped into the portable tank, which is employed to transport diesel to the 4 x 9,000 L tanks and to Fort Eureka's & Skull Point's 20,000 L fuel tanks.

Due to the geographic location of Eureka HAWS and the restrictions that could be caused by severe ice seasons, Eureka always stores diesel fuel for the generator for two years with the hope that, if the ice breaker cannot bring fuel one year, it will be able to do so the following year. Yearly consumption of diesel for the generators and other various uses throughout the station ranges from 500,000 to 700,000 L.

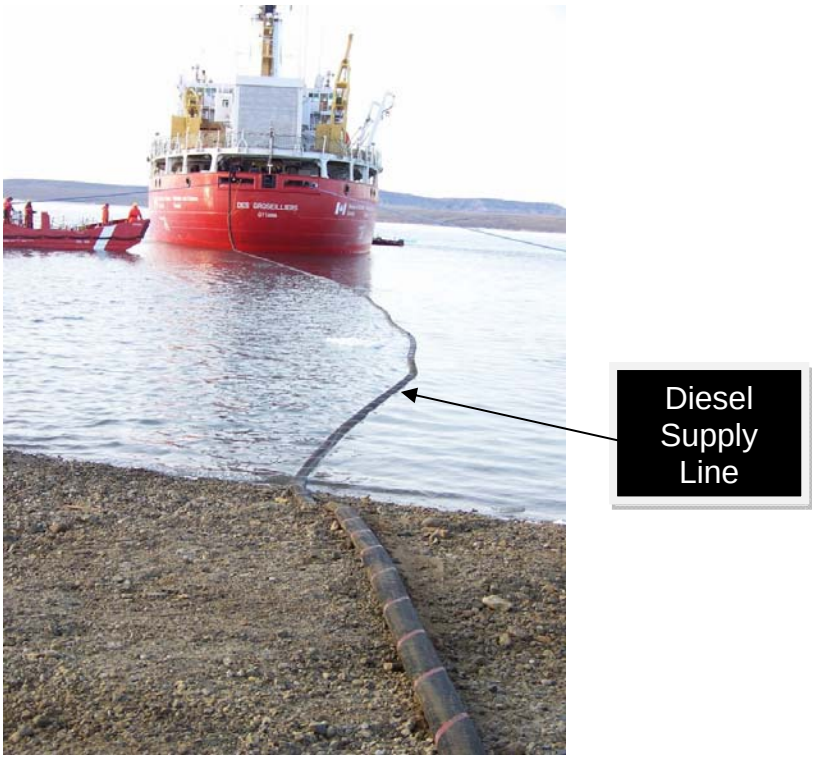


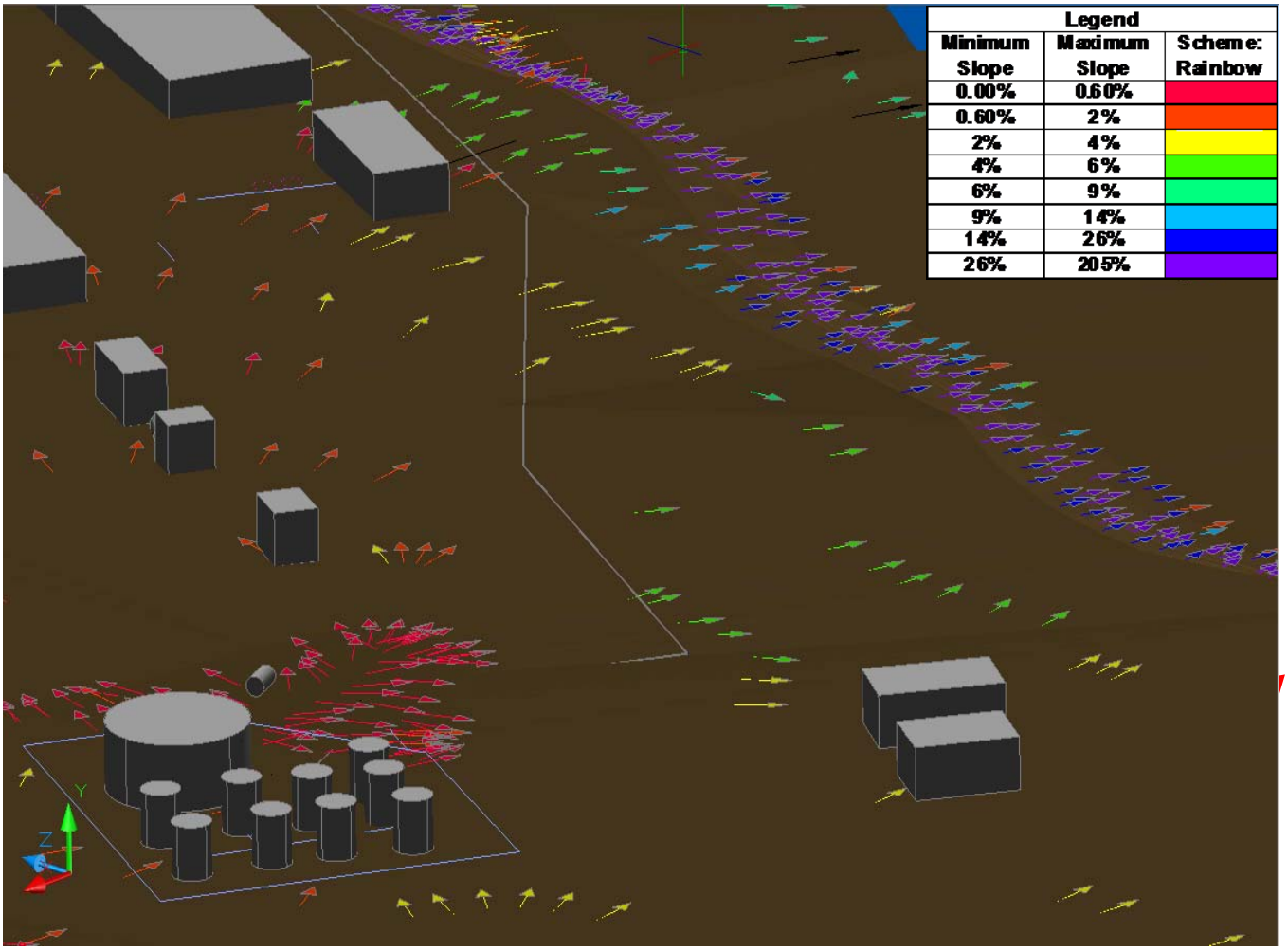
Figure 10: Supply Ship Delivering Diesel Fuel to Eureka

APPENDIX F: EUREKA'S HAWS GASOLINE FUEL SYSTEM

Ten to fifteen barrels of gasoline are brought to Eureka HAWS on the sea-lift each year. The barrels are lifted by a crane on the ship onto a barge which delivers the barrels to the shore (Figure 4). From the barge they are placed on land by a crane located on shore. From the shore, the barrels are conveyed by a loader to the Barrel Storage Area east of the buildings (see Figure 2 and Appendix M) until they are needed to refill the 2,273 L tank. The barrels are brought to the tank by a loader and the contained gasoline is pumped into the gasoline tank.

Figure 11: Transfer of drummed petroleum products to Eureka HAWS

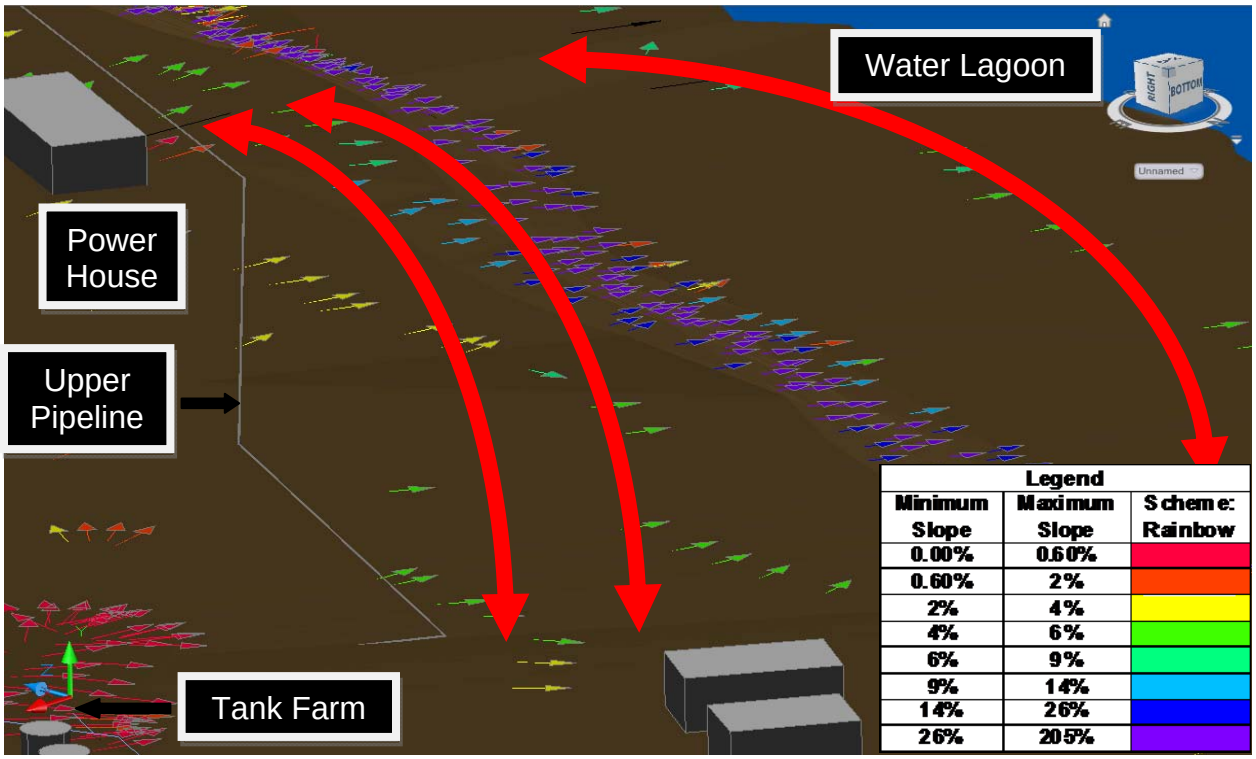
APPENDIX G: TANK FARM: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from tank farm, diesel dispenser, gasoline tank and possible locations of barriers to prevent contamination of water lagoon

- Individual arrows indicate direction of flow of petroleum spill
- Red lines with arrows indicate possible locations of barriers (piled snow, booms, etc.) to prevent petroleum fluid from reaching water lagoon
- Distance from tank farm, diesel dispenser and gasoline tank to ridge is ~ 85 M
- Distance from ridge to water lagoon is an additional ~ 30 M

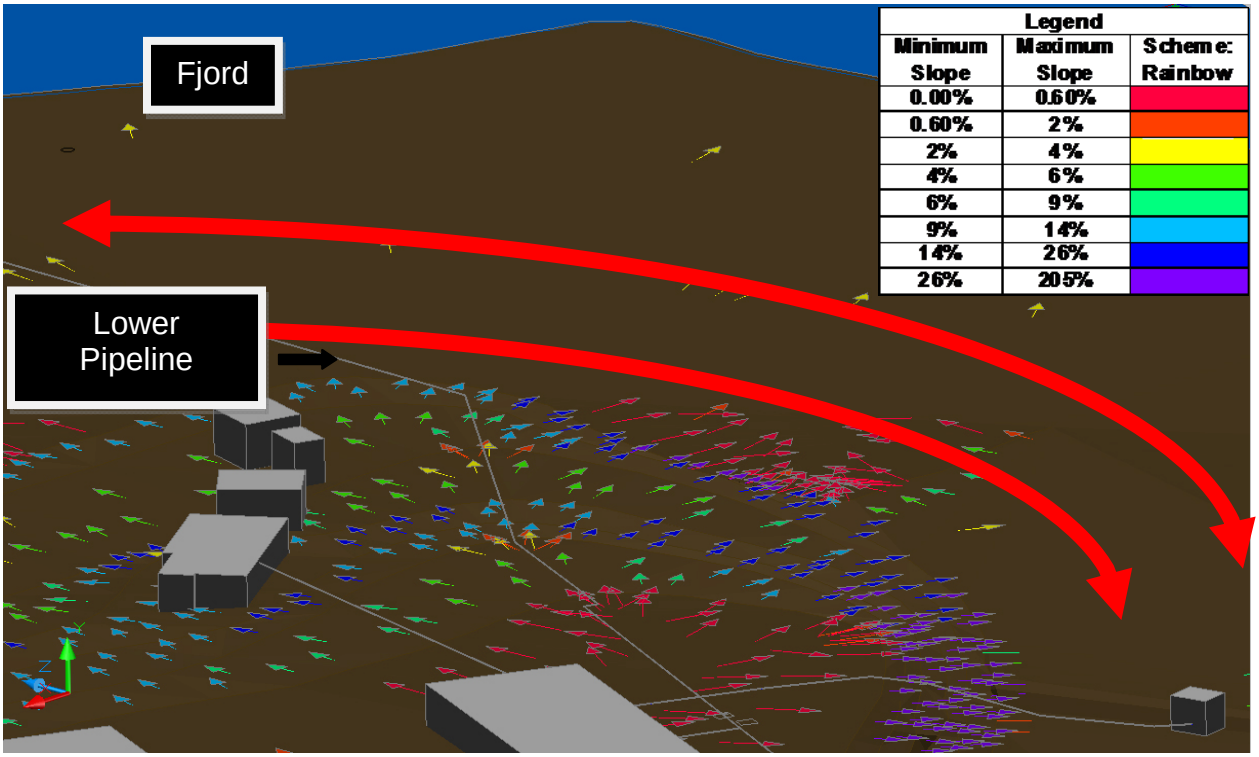
APPENDIX H: NORTH END OF PIPELINE: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from upper end (north end) of pipeline and possible locations of barriers to prevent contamination of water lagoon

- Individual arrows indicate direction of flow of petroleum spill
- Red lines with arrows indicate possible locations of barriers (piled snow, booms, etc.) to prevent petroleum fluid from reaching water lagoon
- Distance from ridge to water lagoon is ~ 30 M

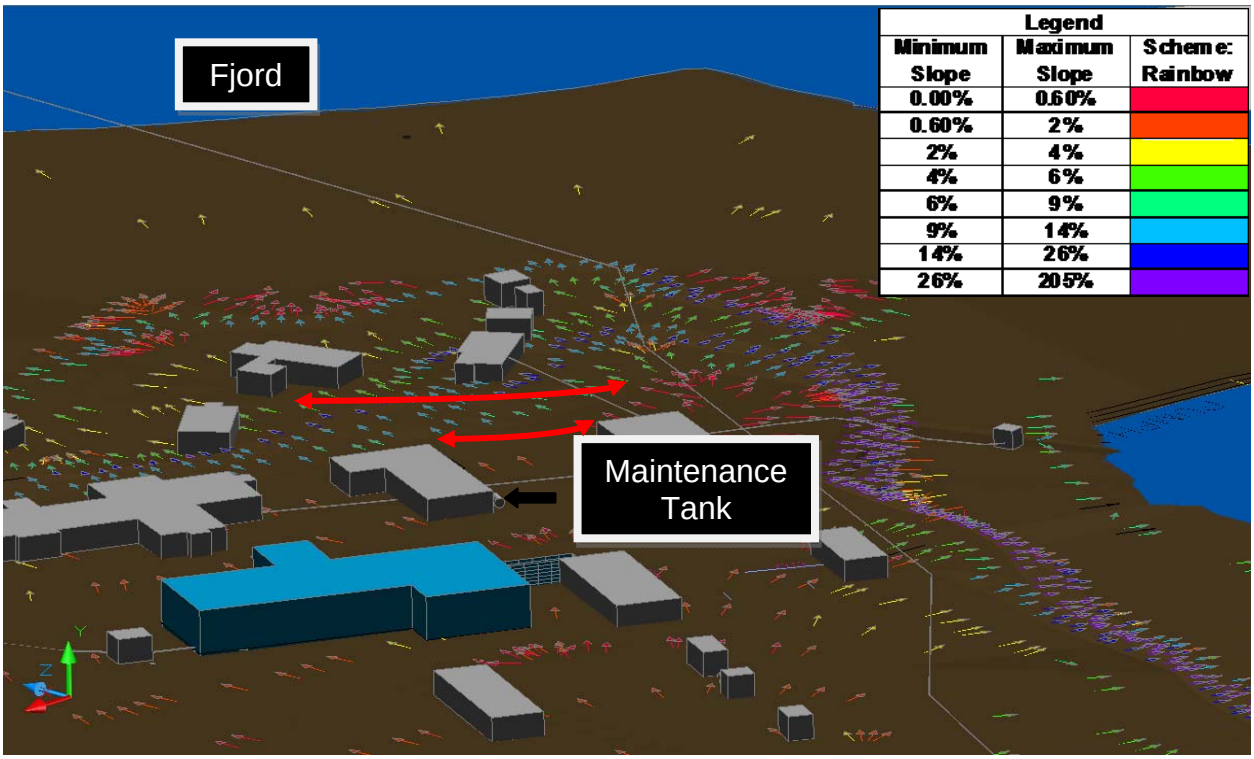
APPENDIX I: SOUTH END OF PIPELINE: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from lower end (south end) of pipeline and possible locations of barriers to prevent contamination of Fjord

- Individual arrows indicate direction of flow of petroleum spill
- Red lines with arrows indicate possible locations of barriers (piled snow, booms, etc.) to prevent petroleum fluid from reaching the Fjord

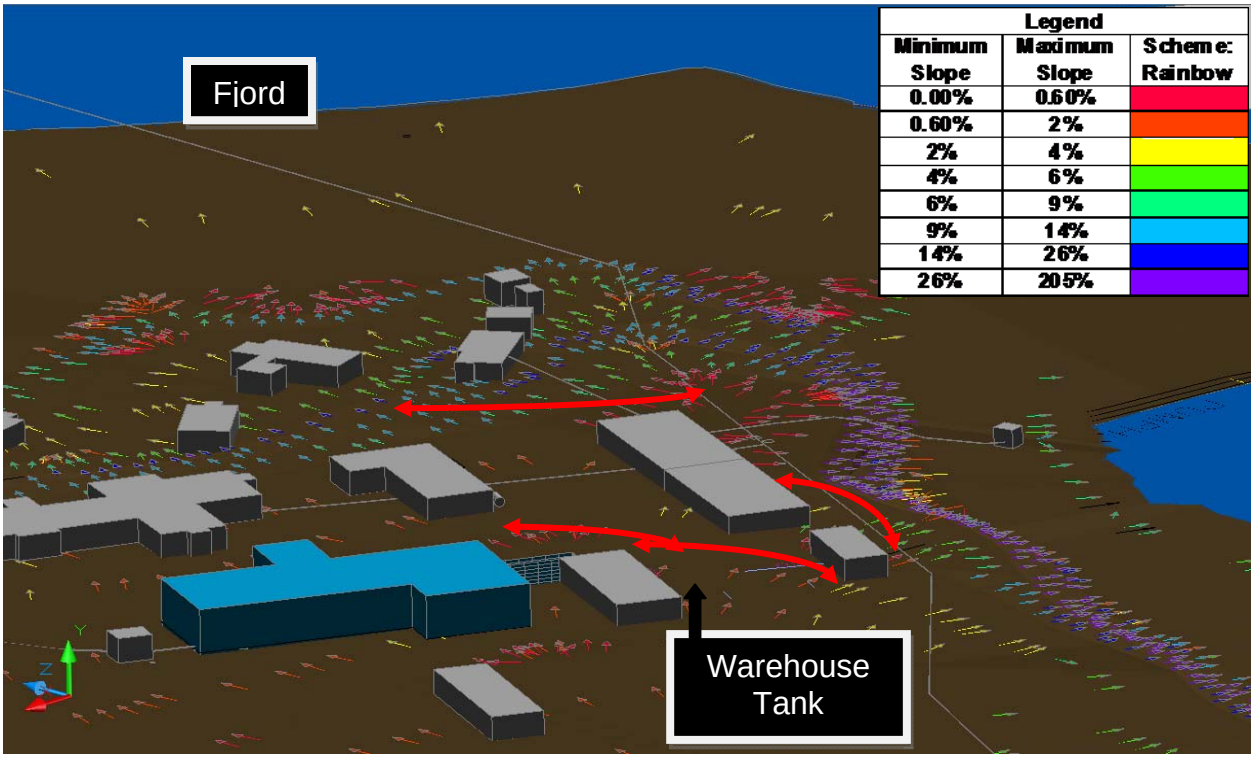
APPENDIX J: MAINTENANCE TANK: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from maintenance tank and possible locations of barriers to prevent contamination of Fjord

- Individual arrows indicate direction of flow of petroleum spill
- Red lines with arrows indicate possible locations of barriers (piled snow, booms, etc.) to prevent petroleum fluid from reaching the Fjord
- Distance from Maintenance Tank to Fjord is ~ 200 M

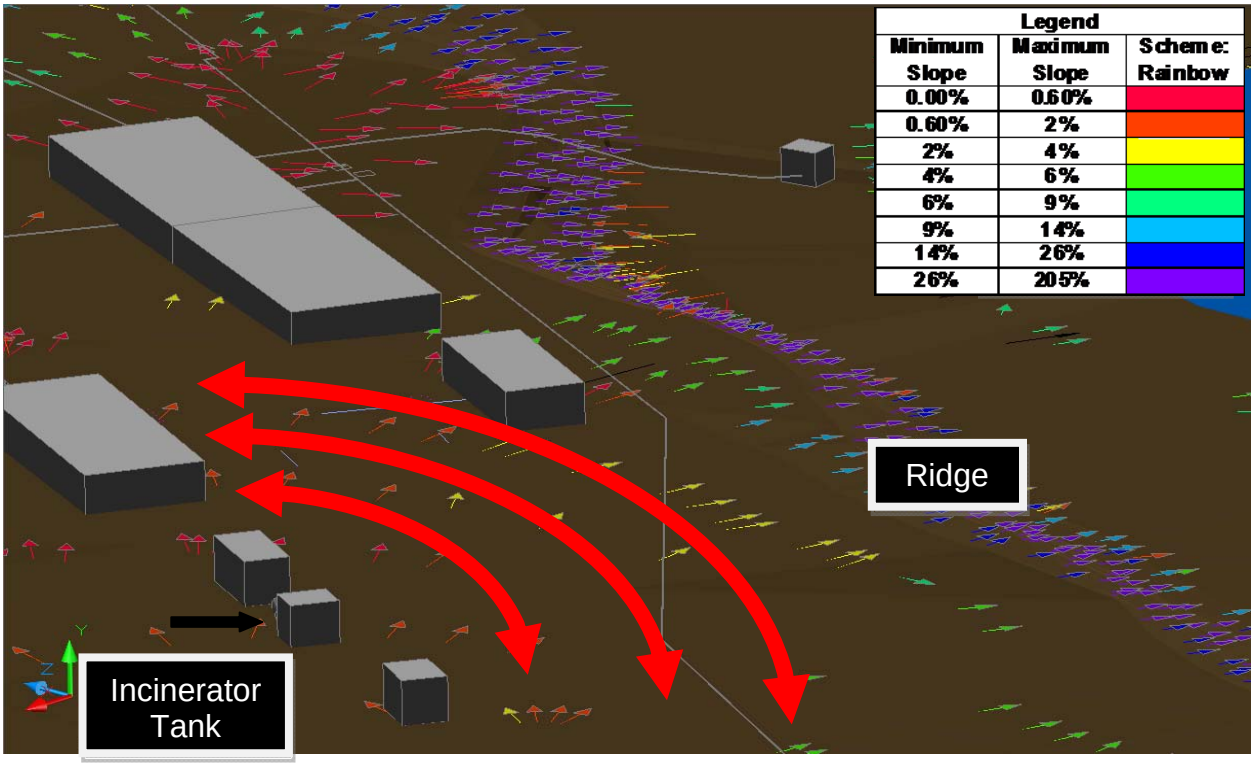
APPENDIX K: WAREHOUSE TANK: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from warehouse tank and possible locations of barriers to prevent contamination of Fjord.

- Individual arrows indicate direction of flow of petroleum spill
- Red lines with arrows indicate possible locations of barriers (piled snow, booms, etc.) to prevent petroleum fluid from reaching the Fjord
- Distance from Warehouse Tank to Fjord is ~ 250 M

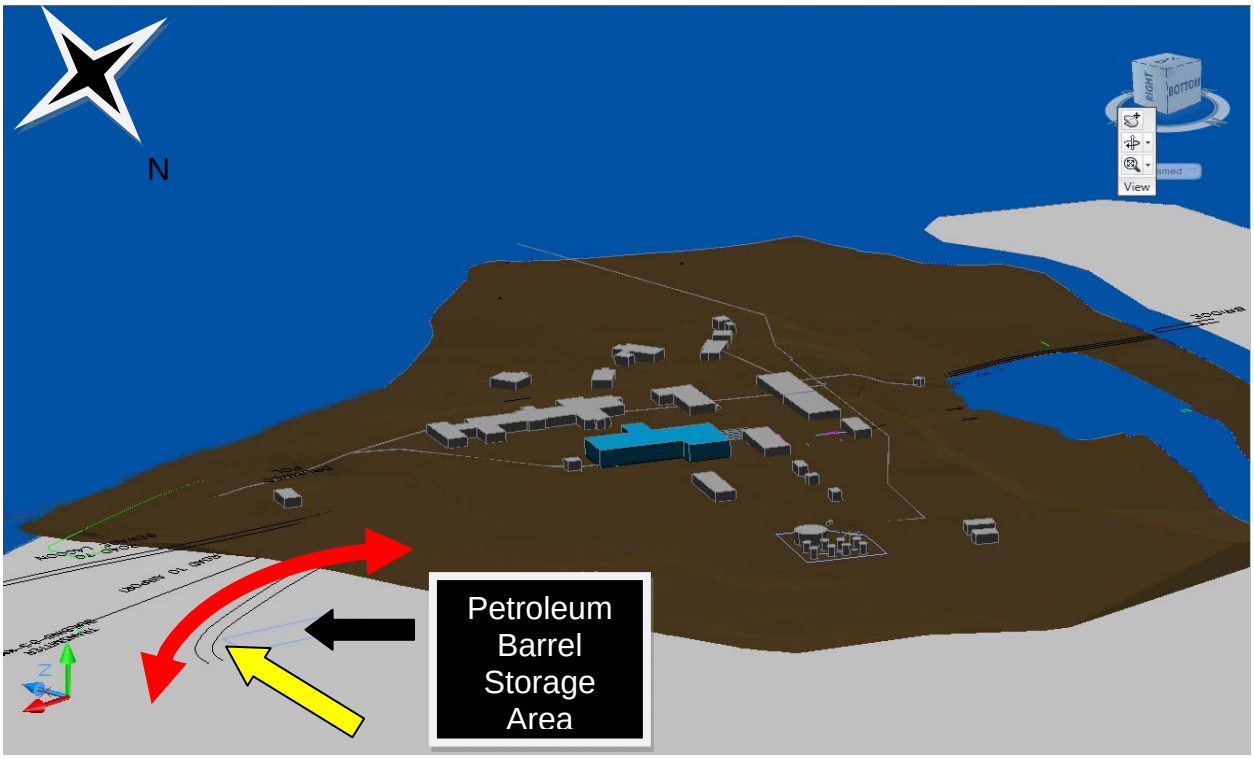
APPENDIX L: INCINERATOR TANK: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from incinerator tank and possible locations of barriers to prevent contamination of water lagoon

- Individual arrows indicate direction of flow of petroleum spill
- Red lines with arrows indicate possible locations of barriers (piled snow, booms, etc.) to prevent petroleum fluid from reaching the Fjord
- Distance from Incinerator Tank to Water Lagoon is ~ 120 M

APPENDIX M: BARREL STORAGE AREA: DIRECTION OF POTENTIAL DISCHARGE



Direction of potential discharge from barrel storage area and possible locations of barriers to prevent contamination of water lagoon

- Yellow arrow indicates direction of flow of petroleum spill
- Red line with arrows indicate possible location of barrier (piled snow, booms, etc.) to prevent petroleum fluid from reaching the Fjord

APPENDIX N: PREVENTATIVE INITIATIVES COMPLETED OR UNDERWAY

1) Fuel tank farm inspected according to API 653.
2) Fuel tanks inspected with respect to compliance with June, 2008 *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.*
3) Fuel tank registration completed in accordance with requirements of above *Regulations* and tanks tagged accordingly.
4) Fuel tanks have been labelled to ensure that the fuel contained therein is properly identified pursuant to Workers Hazardous Materials Information System (WHMIS). Labelling of the tanks and piping for the tank farm has been delayed until repainting is complete in summer 2010. Labels are on site
5) Risk analysis conducted of spills associated with fuel transfer and storage areas.
6) A contract to replace existing hoses in time for the 2010 sealift and provide annual testing and certification is being established.
7) Fuel tanks and associated pipe line will be stripped and repainted. Lead based paint to be sent south for disposal as hazardous material.
8) The mobile tank now has a spill kit.

APPENDIX O: SPILL RESPONSE RESOURCES & EQUIPMENT

The following is a list of Environment Canada equipment on site at Eureka:

1) 2 - 50’ x 24” Containment booms
2) 2 - 5/8” x 100’ Tow Lines
3) 5 - Sorbent Booms (not packages)
4) 5 - Sorbent Rolls
5) 1 - 1000 gallon Port-A-Tank
6) 4 - Hollow Back Round Point Shovels
7) 4 - Rakes
8) 1 - 10 lb. Sledge Hammer
9) 1 - Fire Axe
10) 100 - heavy duty oil spill garbage bags
11) 2 - Portable Honda Generators
12) 6 - portable/mobile radios (167.7 MHz)
13) 1 - Air/Ground base Station (122.8 MHz & 121.5 MHz)
14) 4 - Fire Extinguishers
15) 1 - CAT IT28B Loader
16) 1 - Case 721D Loader

The following could be provided in case of emergency by the Canadian Coast Guard:

1) 1 - Canadian Coast Guard Motorized Landing Craft (LCM)
2) 1 - Canadian Coast Guard Dumb Barge

The following is a list of personal protective equipment (PPE) on site:

1) 10 - goggles
2) 10 - pair nitrile/natural rubber gloves
3) 10 - pair Tyvek Coveralls
4) 6 - set 3 piece rain suits
5) 6 - pair rubber safety boots

APPENDIX P: ENVIRONMENT CANADA SPILL REPORT FORM

Environnement Canada Environment Canada

Spill Report

Internal use only

All releases of petroleum product or allied product MUST be reported by telephone as soon as possible.

This form should be completed by the owner, operator, or the person responsible for managing the response.

Date of Incident :	**Time of Incident:**	**EC Property:**
_____	_____	_____
Weather Conditions:		
_____		

Owner Name:_____ **Division and Direction:** _____

Telephone Number: _____

Operator Name:_____ **Telephone Number:** _____

Reported by:_____ **Signature:**_____

EC Tank Registration Number, if applicable:	EC-_____	EC-_____
Type of Fuel:	_____	
Source of Spill:	Storage Tank ☐ Barrel/Drums ☐ Pumping Operation ☐	Vehicle ☐ Other: _____
How much fuel spilled?	Litres:_____	**If more than 100L, this report SHALL be faxed or scanned to the federal authority with 48 hours.**

Property Management Division, ACEMD

Canada

Environnement Canada Environment Canada

Spill Report

Internal use only

Description of the spill:	Location of spill:	_____
		_____
	Surface or approximate area affected:	_____
	Is the spill contained?	YES ☐ NO ☐
Release Site Description:	Surface at Site:	☐ Paved ☐ Gravel ☐ Vegetation ☐ Concrete Surface
What waterways are in the vicinity of the product release (if applicable)?	_____	
	_____	

Did you contact the appropriate federal authority spill action centres?[1]	YES ☐ NO ☐	Which centre did you contact? _____
Who at EC spill center did you talk to?	Name: _____	Function: _____
	Date: _____	
Incident Number:	_____	
Was a 3rd party property affected by the release?	YES ☐ NO ☐	If yes, who: _____

[1] Refer to PDF Canadian Environmental Emergencies Notification System

Property Management Division, ACEMD

Canada

Environnement Canada Environment Canada

Spill Report

Internal use only

What mitigating measures did you take?	☐ Stop the flow of product ☐ Turned off pumping unit (if applicable) or close manifold valve ☐ Eliminated all sources of ignition ☐ Secured the area ☐ Put on goggles and petroleum resistant gloves and boots ☐ Used absorbents located in storage units to contain and clean up all product ☐ Placed all absorbents in metal drums for disposal ☐ Transport drums to a secure area within facility for temporary storage ☐ Made arrangements to dispose of contaminated materials at an authorized disposal site Other:_____		
Is it possible to keep the system running?	YES ☐	NO ☐	
Is someone supposed to come and fix anything?	YES ☐	NO ☐	If yes, who: _____ _____ _____
The organizations that were notified and / or are involved as well as other relevant information:	_____ _____ _____ _____ _____		

Property Management Division, ACEMD

Canada

Environnement Canada Environment Canada

Spill Report

Internal use only

Property Management Division, ACEMD

Canada

APPENDIX Q: SPILL REPORTING FORM: NUNAVUT GOVERNMENT

Please visit http://www.gov.nu.ca/env/ntnuspill.pdf for the full form.

REFERENCES

1. Eureka Site Safety and Emergency Contingency Plans, Environment Canada, August 2009.
2. Guidelines for Spill Contingency Planning, Indian and Northern Affairs Canada, April 2007.
3. Nunavut Water Board Licence No. 3BC-EUR0611 issued to Environment Canada by the Nunavut Water Board, February 6, 2006.
4. Oil Pollution Emergency Plan for Fuel Transfer at Eureka HAWS, Environment Canada, July 2006.
5. Oil Pollution Emergency Plan for Land Spills, - Eureka High Arctic Weather Station – in support of the Nunavut Water Board Licence No. 3BC-EUR0611, Environment Canada, March 2009.
6. Summary of Operations and Maintenance Procedures for Sewage, Solid Waste Disposal and Waste Treatment Facilities – Eureka High Arctic Weather Station – in support of the Nunavut Water Board Licence No. 3BC-EUR0611, Environment Canada, March 2009.
7. Summary of Spill Events in Canada, 1984-1995, Environment Canada.