

Spill Contingency Plan

For:

New Discovery Mines Ltd.
1909 108 W. Cordova St.,
Vancouver, B.C.
V6B 0G5

Effective:

August, 2016

Revision 1, April 2014

Minor formatting to better conform to Guidelines for Spill Contingency Planning, April 2007.
Incorporate facility description and map defining roads, water bodies, and hazardous materials storage locations.
Add design and construction of fuel storage and hazardous materials storage area.
Remedial response incorporated for all chemical types on site.
Add drill additives to plan

Revision 2, May 2015

Modify to incorporate milling of ores and deposition of tailings.

Revision 3, August 2016

Update, minor changes as per letter from MVLWB date July 3, 2014
Gylcol lubricants, ammonium nitrate handling updated

1) Introduction and Project Details

New Discovery Mines Ltd. has prepared this spill contingency plan for drilling, exploration, processing, and deposition of solid tailing activities being undertaken at their camp on the northwest shore of Discovery Lake, Northwest Territories. The plan demonstrates that New Discovery Mines Ltd. has appropriate response capabilities and measures in place to effectively address potential spills at its Discovery Lake site.

i) Company name, location and mailing address

New Discovery Mines Ltd.,
Northwest shore of Discovery Lake, Northwest Territories
62° 53' 52" North latitude, 114° 19' 32" West longitude

Mailing address:

1909 108 W. Cordova St.,

Vancouver, B.C.,
V6B 0G5
Attention: Dr. D.R. Webb, President

ii) Effective date of spill contingency plan: August 2016

iii) Last revisions to spill contingency plan: August 2016

iv) Distribution list:

The plan and the most recent revisions have been distributed to:

Company personnel

v) Purpose and scope:

The purpose of this plan is to outline response actions for potential spills of any size, including a worst case scenario for New Discovery Mines Ltd. site at Discovery Lake. The plan identifies key response personnel and their roles and responsibilities in the event of a spill, as well as the equipment and other resources available to respond to a spill. It details spill response procedures that will minimize potential health and safety hazards, environmental damage, and clean-up efforts. The plan has been prepared to ensure quick access to all the information required in responding to a spill.

vi) Company environmental policy

New Discovery Mines Ltd. is committed to the concept of sustainable development and the protection of the environment and human health. New Discovery Mines Ltd.'s environmental, health and safety policy is to:

- protecting employees, the public and the environment
- fully comply with all applicable legislation, regulations, and authorizations
- work proactively with federal, territorial and Aboriginal governments, other relevant organizations, and the general public, on all aspects of environmental protection
- anticipate future spill control requirements and make provision for them
- keep employees, contractors, Inspectors, Land and Water Boards, appropriate governments (Aboriginal, federal and territorial), and the public informed of any changes at the site or with project activities.

The plan is presented to all staff during their on-site orientation sessions. All employees and contractors are aware of the locations of the plan on the site at Discovery Lake and in the head office in Vancouver. During the orientation meeting, training sessions are scheduled to ensure employees have an understanding of the steps to be undertaken in the event of a spill. All employees and contractors are shown where spill kits are stored, are aware of their contents and are trained in using spill equipment and responding to spills. The company is committed to keeping personnel up to date on the latest technologies and spill response methods.

vii) Project description:

The Discovery Lake location of New Discovery Mines Ltd. is used as a camp and staging area for local test drilling as well as exploration activities in the surrounding region. Permits and licenses have been received for the company's bulk sample, drilling and exploration activities. The camp will operate year round, except freeze-up and break-up, at varying levels of capacity. Permits to add a mill capable of processing 100 tonnes per day and all related infrastructure including storage of tailings in a dry stack are being submitted to the authorities.

viii) Site description:

The camp will be located 50 kilometres north of Yellowknife on the northwest shore of Discovery Lake, at 62° 53' 52" North latitude, 114° 19' 32" West longitude. It is a remote area, with no adjacent communities or inhabitants. Thus the only people immediately affected by a potential spill are employees or contractors.

The site is located 3 kilometres west of the Secondary Winter Road to the Diamond Mines and Tyhee's Yellowknife Gold Project. It is located 4 km southwest of Tyhee's Clan Lake Property. Figure 1 illustrates New Discovery Mines Ltd. site on a 1:50,000 scale.

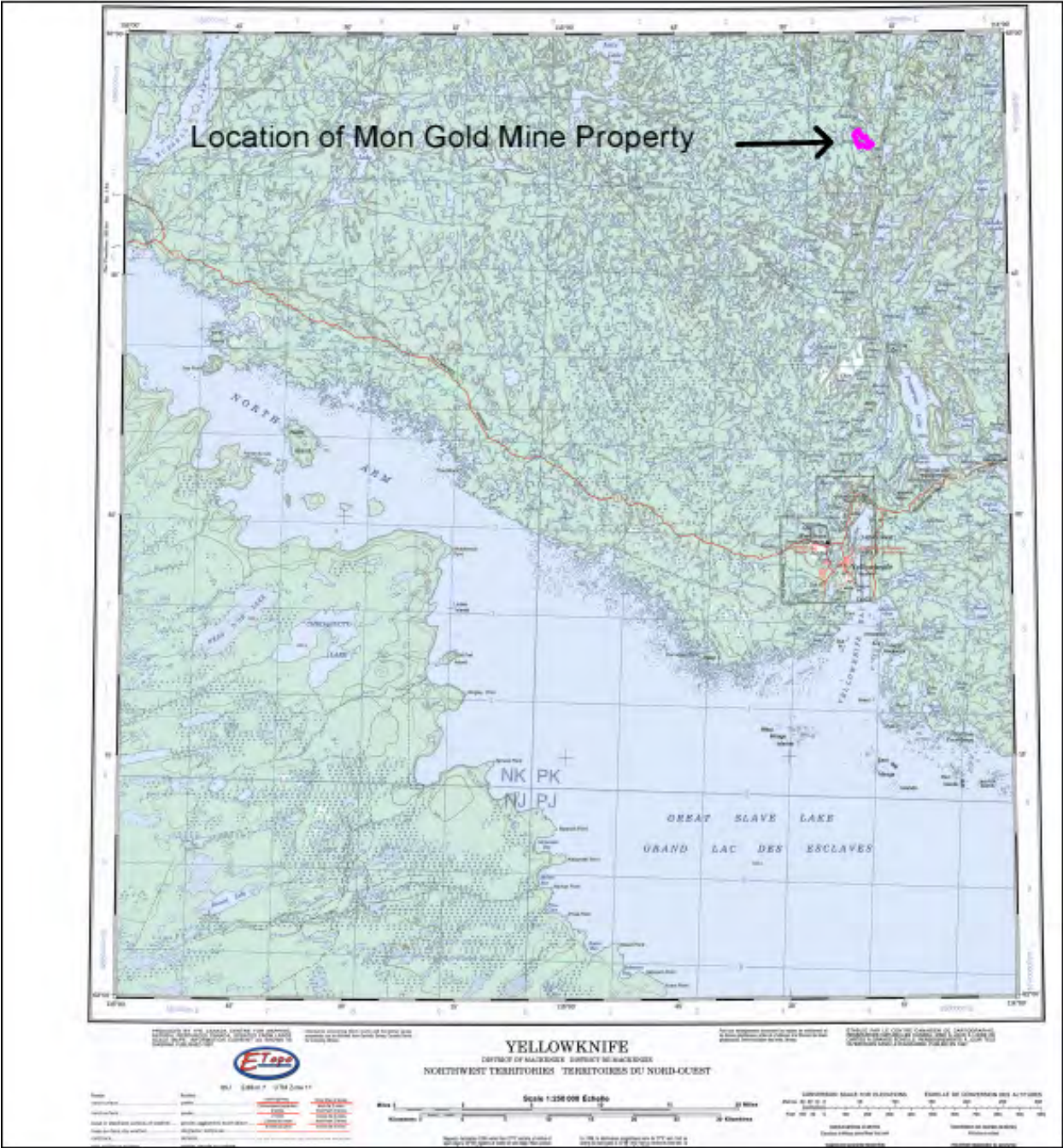


Figure 1: Site location map

A map of the site including the location of fuel storage areas, offices, kitchen, sleeping shelters, generators, helicopter landing pad, drilling site and surrounding water bodies and direction of flow is presented in Figure 2. All buildings and fuel storage areas are at least 100 meters from the nearest water body. All supplies arrive on-site via air (twin otter or helicopter). The lake is used for landing float planes in the summer and planes on skis in the winter on the north shore of the camp.

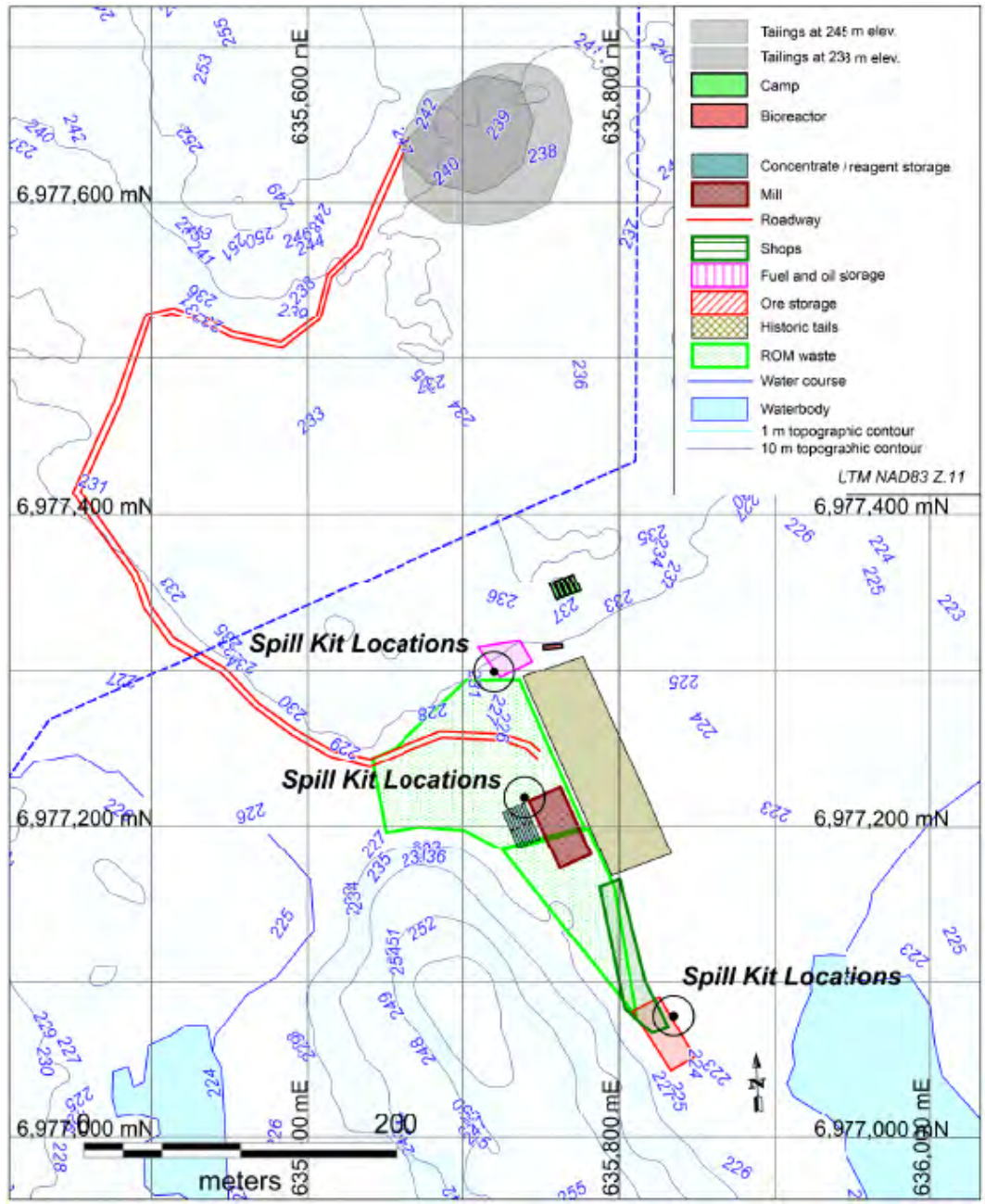


Figure 2: Sketch of site plan including buildings, roads, water bodies, hazardous material locations, spill kit locations.

ix) List of hazardous materials on-site

There are two fuel storage areas on site. The fuel storage area near the mine site is for storing diesel, oils, and gasoline. The second fuel storage area near the camp site contains only diesel and propane.

The mill building and storage container will contain reagents used in the processing of ores.

Table 1 presents a list of hazardous materials on-site, the type of storage container, the average and maximum quantities stored and their storage location.

Table 1: List of hazardous materials stored on-site, type of storage container, the normal and maximum storage quantities, and storage locations

Material	Storage Container	Normally On-site	Maximum On-site	Storage Location (see Figure 1) and Uses
Diesel Fuel	200 L drums	12,000 L (60 drums)	24,000 L (120 drums)	Two fuel storage areas. Used to heat communal buildings by oil stoves and used for mine equipment.
Diesel Fuel (*)	20,000 L mobile tank		20,000 L	Mobile tanker truck if permitted, CSA 602 standards
Jet B Fuel	200 L drums	400 L (2 drums)	800 L (4 drums)	Fuel storage area near mine site. Used to power helicopters and twin otter aircraft.
Gasoline	200 L drums	600 L (3 drums)	1,000 L (4 drums)	Two fuel storage areas. Used for quads, boats, chainsaws, PU trucks.
Propane	45kg cylinders	135 kg (3 cylinders)	450 kg (5 cylinders)	Fuel storage area near camp. Used for kitchen stove and fridge.
Glycol	4 litre jugs	12 litres	25 litres	At drill site, in shops
Lubricating Oil	200 L drums	400 L (2 drums)	600 L (3 drums)	Lubrication of air tools
Flotation Extender (A208)	200 L drums	200 L (1 drum)	400 L (2 drums)	Flotation reagent
Flotation Frother (MIBC)	200 L drums	200 L (1 drum)	400 L (2 drums)	Flotation reagent
Flotation Collector (PAX)	50 kg bags	500 kg	500 kg	Flotation reagent
Copper Sulphate	50 kg bags	500 kg	500 kg	Flotation reagent

*Note: Either CSA 602 mobile tankers or 200 L drums for diesel fuel, NOT BOTH

Waste oil is stored in empty 200 L drums in either of the fuel storage areas, and shipped out by plane or truck for off-site disposal at an appropriate waste facility.

Other hazardous materials found on-site in very small quantities are in a storage building and/or the kitchen. These include lubricants/oil/grease for maintenance of motorized equipment and general cleaning products for kitchen/bathroom/office use.

Motorized equipment on site includes one all-terrain vehicles, two scoop trams, drill jumbo, loader, end-dump trucks, small bulldozer, diamond drill, two pick-up trucks, a boat (for emergency response; eg. airplane accident) and three fuel transfer hoses with pumps.

All buildings containing hazardous materials are over 100 m from any water body. Material Safety Data Sheets for each hazardous material are included in Appendix B-1.

x) Existing preventative measures:

Planning for an emergency situation is imperative, due to the nature of the materials stored on site as well as the remoteness of the site. Along with the preventative measures outlined below, adequate training of staff and contractors is paramount.

All hazardous materials arrive by air as needed throughout the year. They are unloaded by truck, airplane and helicopter pilots and New Discovery Mines Ltd. staff and carefully placed in the fuel storage areas. Protective clothing, steel toe boots, and gloves are worn while unloading the fuel drums.

The storage areas for diesel fuel, Jet B fuel, gasoline and propane are on a prepared rock pad. In addition the fuel drums used for the oil stoves heating common areas are in secondary containers that are leak proof and are placed on a drip tray.

Spill kits are located wherever fuel is stored or used (see Figure 2). See Section 4.i. for details on spill kit contents. Portable drip trays and appropriately sized fuel transfer hoses with pumps are used when refuelling aircraft, ATVs, or other motorized equipment, to avoid any leaks/drips onto the land.

The camp manager or designated fuel monitor conducts daily visual inspections to check for leaks or damage to the fuel storage containers, as well as for stained or discoloured soils around the fuel storage areas and adjacent motorized equipment. For example, lids/caps are checked for tight seals. A checklist is used to ensure no areas have been missed and results of the inspections are recorded in the company database. Regular maintenance and oil checks of all motorized equipment are also undertaken to avoid preventable leaks.

Gray water is piped to a transfer sump and then pumped at least 100 m from the kitchen, office and sleeping quarters. The sump and pipe are inspected regularly for leaks or overflow.

xi) Additional copies:

Several copies of the plan are kept on-site at all times at the two fuel storage areas, in the office and in the kitchen building. A copy is also held at the company's main office/headquarters in Yellowknife, Northwest Territories and with the Land and Water Board. Additional copies of the plan can be obtained by contacting the company directly at the phone number, fax or email presented in section 1i).

xii) Process for staff response to media and public inquiries:

The company has established procedures for dealing with media and public inquiries. All inquiries are to be directed to the president at the headquarters office in Vancouver. If the president is not available, there will be another staff member available to act in this position. No reporter or member of the public is allowed on site without approvals (MIS- regulations).

The camp manager should always keep the president informed of any news or updates of potential interest to the media or general public, such that the company is prepared to deal with inquiries any time.

If a spill has occurred and a NWT Spill Report needs to be filled out (see Appendix B-2). This information is available for the public to view upon request by contacting the NWT Spill Line or by viewing the GNWT Hazardous Materials Spills Database [online](#)

2) Response Organization

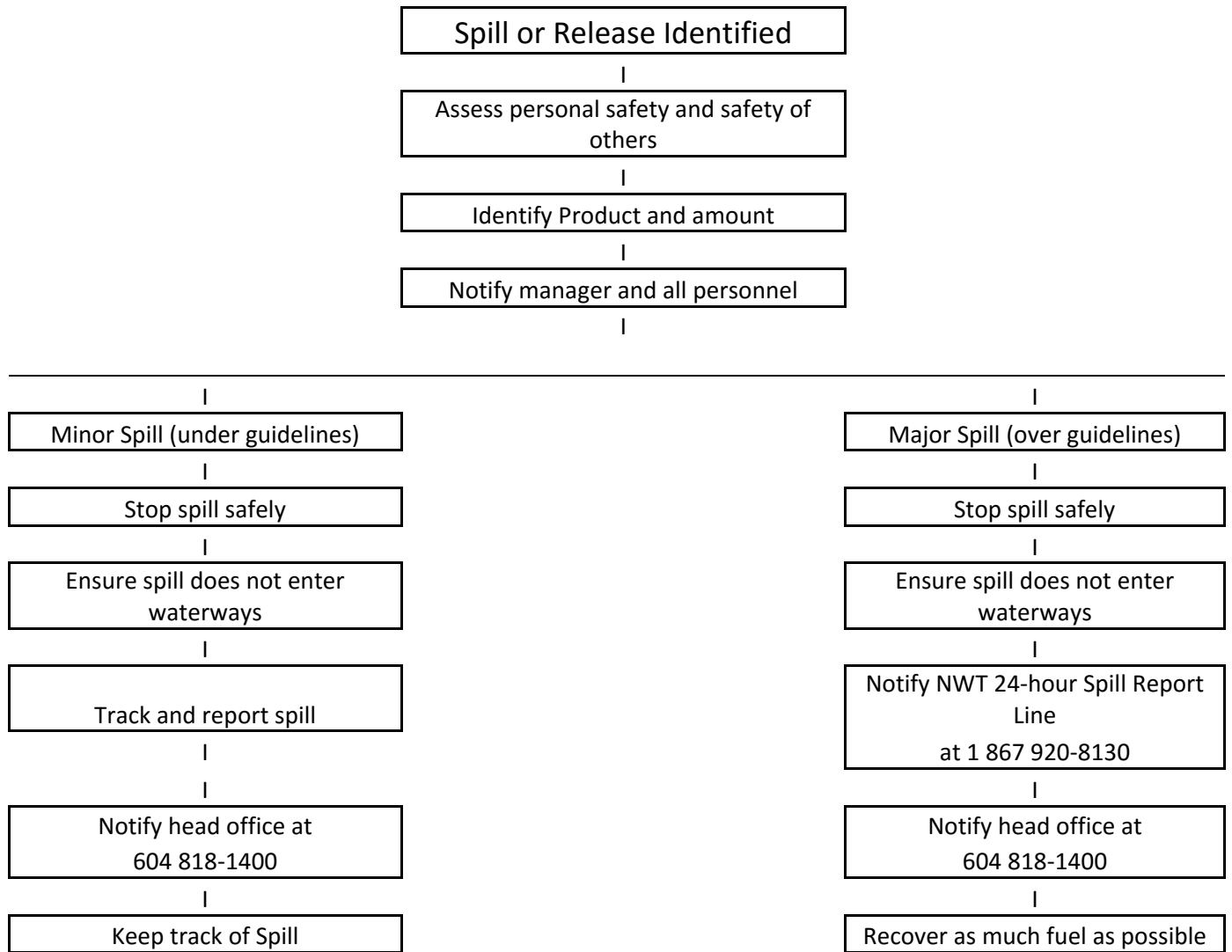
The flow chart depicted in Figure 3 identifies the response organization and when applicable their alternates, as well as the chain of command for responding to a spill or release. The duties of various response personnel are summarized, contact information is provided including 24-hour phone numbers for responsible people and the location of communications equipment on site is discussed.

An immediately reportable spill is defined as a release of a substance that is likely to be an imminent environmental or human health hazard or meets or exceeds the volumes outlined in Appendix B-3. It must be reported to the NWT 24-Hour Spill Report Line at 867-920-8130. Any spills less than these quantities do not need to be reported immediately to the spill reporting line. Rather, these minor spills will be tracked and documented by the company and submitted to the appropriate authority either immediately upon request or at a pre-determined reporting interval. If there is any doubt that the quantity spilled exceeds reportable levels, the spill will be reported to the NWT 24-Hour Spill Report Line.

Emergency satellite phones are located in the office. In the event of a spill involving danger to human life these phones will be used to contact emergency response personnel in Yellowknife. In addition, all employees and contractors carry two-way radios for communication with the camp manager and other staff on site.

Following reporting of the spill to the camp manager, he/she will report spills to the NWT 24-Hour Spill Line as necessary. The camp manager will also inform the head office for tracking spills in company databases and notify the head office in the event of media inquiries. The 24-hour emergency head office number is 604 818-1400.

Figure 3: Flow chart of response organization (details of each step will be provided in the procedures for initial actions under Section 3 Action Plan)



3) Action Plan

i) Potential spill sizes and sources for each hazardous material on site

In Table 2, a list of potential discharge events, with associated discharge volumes and directions is presented for the primary hazardous materials stored on site. 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 hazardous materials, potential discharge events, potential discharge volumes (worst case scenario in brackets) and direction of potential discharge

Material (sources)	Potential Discharge Event	Discharge Volume (worst case)	Direction of Potential Discharge
Diesel Fuel (vehicles, oil stoves)	<ol style="list-style-type: none"> 1. Over pumping of fuel from drum into vehicle. 2. Leaking from vehicle. 3. Minor leaking fuel drum in/outside fuel storage area. 4. Large puncture, fast leaking drum in/outside fuel storage area. 5. From drum connection to stoves in communal buildings. 6. All drums punctured and leaking at once (very unlikely). 7. Leaking tanker, large or small holes, or faulty valves 	<p>Likely under 200 L/1 drum (max 12,000 L/ 60 drums)</p> <p>Potential from tanker up to 30,000 liters</p>	<p>Toward stream from drill site or fuel storage area near drill site.</p> <p>In camp on flat ground, from fuel storage area or communal buildings with potential underground seepage to Lake Invisible and/or stream.</p>
Jet B Fuel (twin otter, helicopter)	<ol style="list-style-type: none"> 1. Over filling of aircraft. 2. Leak from drum or hose while filling aircraft. 3. Minor leaking fuel drum in/out side fuel storage area. 4. Large puncture, fast leaking drum in/outside fuel storage area. 5. All drums punctured and leaking at once (very unlikely). 	<p>Likely under 200 L/1 drum (max 800 L/ 4 drums)</p>	<p>In camp on flat ground, from fuel storage area or helicopter pad with potential underground seepage to Discovery Lake and/ or stream.</p> <p>In Discovery Lake while refueling aircraft.</p>
Gasoline (ATVs, trucks)	<ol style="list-style-type: none"> 1. Over filling of ATVs or snow machines (small spill) 2. Leak from drum or hose while filing ATVs or snow machines. 3. Minor leaking fuel drum in/outside fuel storage area. 4. Large puncture, fast leaking drum in/outside fuel storage area. 5. All drums punctured and leaking at once (very unlikely) 	<p>Likely under 200 L/1 drum (max 1,000 L/ 5 drums)</p>	<p>In camp on flat ground, from fuel storage area with potential underground seepage to Discovery Lake and/or stream.</p> <p>Toward stream from fuel storage area near mine site.</p>
Propane (kitchen stove and fridge)	<ol style="list-style-type: none"> 1. Leak while connected to kitchen stove or fridge. 2. Minor leaking cylinder in or outside fuel storage area. 	<p>Likely under 45 kg/ 1 cylinder (max 450 kg/ 5 cylinders)</p>	<p>In camp on flat ground, from fuel storage area or communal buildings with no potential underground</p>

	<ol style="list-style-type: none"> 3. Large puncture, fast leaking cylinder in/outside fuel storage area. 4. All cylinders punctured and leaking at once (very unlikely). 		seepage to Discovery Lake and/or stream.
Lubricating Oils	<ol style="list-style-type: none"> 1. Spill from equipment 2. Spill from drums 3. Poor management during maintenance 	Likely 1 drum (200 litres)	Toward water body, from equipment park, underground, or around stationary equipment.
Glycol	<ol style="list-style-type: none"> 1. Spill from equipment 2. Spill from equipment 3. Poor management during maintenance 	Likely less than 4 litres	Toward water body, from equipment park, underground, or around stationary equipment.
Potassium Amyl Xanthate (PAX)	<ol style="list-style-type: none"> 4. Damaged or spilled container 5. Poorly maintained feeder in mill 	<p>Likely 50 kg (one package)</p> <p>Potential up to 500 kg (all on site)</p>	<p>Toward stream from storage container</p> <p>From Mill building</p>
Aeroflot	<ol style="list-style-type: none"> 1. Damaged or tipped/spilled drum 2. Poorly maintained feeder in mill 	<p>Likely 200 L (one drum)</p> <p>Potential up to 400 L (all on site)</p>	<p>Toward stream from storage container</p> <p>From Mill building</p>
Methyl Isobutyl Carbinol (MIBC)	<ol style="list-style-type: none"> 1. Damaged or tipped/spilled drum 2. Poorly maintained feeder in mill 	<p>Likely 200 L (one drum)</p> <p>Potential up to 400 L (all on site)</p>	<p>Toward stream from storage container</p> <p>From Mill building</p>
Copper Sulphate	<ol style="list-style-type: none"> 1. Damaged or spilled container 2. Poorly maintained feeder in mill 	<p>Likely 50 kg (one package)</p> <p>Potential up to 500 kg (all on site)</p>	<p>Toward stream from storage container</p> <p>From Mill building</p>

Waste oil stored in empty 200 L drums, could potentially leak. The quantity of waste oil drums would be quite limited as they would be shipped out by plane as they are filled up. The risk of a spill from a waste oil drum impacting the environment is very low as waste oil is stored in a bermed site designated for certain wastes.

ii) Potential environmental impacts of spill (include worst case scenario)

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

Gasoline

Environmental impacts: Gasoline may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Gasoline is quick to volatilize. Runoff into water bodies must be avoided.

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

Diesel Fuel

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

Worst case scenario: All fuel drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. If a transport tanker is utilized, potentially 30,000 liters could be leaked. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

Lubricating Oils

Environmental impacts: Lubricating oils may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Lubricating oils do not burn easily. Runoff into water bodies must be avoided.

Worst case scenario: All lubricating oil drums were punctured or open simultaneously and contents seeped into surrounding soil and water bodies. If a transport tanker is utilized, potentially 30,000 liters could be leaked. This could cause illness or death to aquatic life and indirectly affect wildlife feeding from the land and water.

Glycol

Environmental impacts: Glycol may be harmful to wildlife and aquatic life. It is biodegradable but is toxic. Runoff into water bodies must be avoided.

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

Jet B Fuel

Environmental impacts: Jet B fuel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Jet B fuel volatilizes relatively quickly. Runoff into water bodies must be avoided.

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

Propane

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

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

Waste Oil and Miscellaneous Oils/Grease

Environmental impacts: Waste oils may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Runoff into water bodies must be avoided.

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

Mill Reagents

Environmental Impacts:

PAX may be harmful to wildlife and aquatic life. May be fatal if swallowed. Harmful if inhaled. Causes skin and eye irritation. Dust is irritating to respiratory tract. See "Other Health Effects" Section. Heating of solid xanthate or aging or heating of solutions will cause formation of Carbon Bisulfide. Upon exposure of solid xanthates to moisture and/or heat, decomposition results and spontaneous combustion can occur. Contact of solid xanthate with moist air has resulted in ignition. (4) Emits a flammable gas upon contact with water or water vapour. Can decompose at high temperatures forming toxic gases. Powdered material may form explosive dust/air mixtures. Contents may develop pressure on prolonged exposure to heat.

MIBC Anesthetic effects can be expected at high vapor concentrations. Vapor concentrations of 50 ppm for 15 minutes are irritating to the eyes, nose and throat. The ACGIH TLV-TWA for MIBC is 25 ppm (104 mg/m³) and the TLV-STEL is 40 ppm (167 mg/m³). The 4-hour LC50 for MIBC was > 16 mg/L (3776 ppm).

MIBC has minimal acute toxicity by oral and dermal routes of exposure. The acute oral and dermal LD50 values for MIBC are 2260 – 2970 mg/kg and 2870 mg/kg, respectively. There are no known sensitization or cancer hazards. MIBC can enter the environment as emissions from its manufacture and use as a frother. 94% is biodegraded within 20 days.

Areoflot are a class of reagents used to enhance collection of sulphides in flotation. The acute oral (rat) LD50 and dermal (rabbit) LD50 values are 4060 mg/kg and >5000 mg/kg respectively. Marked irritation and skin corrosion were produced during primary irritation studies with rabbits. Contact with acid may cause liberation of hydrogen sulphide.

Copper sulphate is a metal salt used to enhance the collection of sulphide minerals in froth flotation systems. Severe exposure or chronic exposure by ingestion or inhalation of copper sulphate may induce severe gastroenteric distress (vomiting, gastroenteric pain, local corrosion, and hemorrhages), a metallic taste in the mouth, prostration, anuria, hematuria, anemia, an increase in white blood cells, coma, respiration difficulties, and circulatory problems. The product is toxic to fish.

iii) Procedures:

A. Procedures for initial actions

- Ensure safety of all personnel
- Assess spill hazards and risks.
- Remove all sources of ignition.
- Stop the spill if safely possible e.g. shut of pump, replace cap, tip drum upward, patch leaking hole. Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so. Gloves are located in the spill kit and should be worn immediately if there is any risk of being in contact with fuel. Transfer the remaining material in the defective or leaky container into a suitable secure container.
- No matter what the volume is, notify camp manager.
- Contain the spill – use contents of spill kits to place sorbent materials on the spill, or use shovel to dig dike to contain spill. Methods will vary depending on the nature of the spill. See Section C for more details.

B. Spill reporting procedures

Report spill immediately to camp manager, who will determine if spill is to be reported to the NWT 24-Hour Spill Line at 867-920-8130.

Each spill kit, as well as the office and camp manager, will have copies of the NWT Spill Report form to be filled out (see Appendix B-2). Fill out and fax or email the Spill Report to the staff of the NWT 24-Hour spill line. Also fax or email the report to the head office.

NWT 24-Hour Spill Line Phone: (867) 920-8130

NWT 24-Hour Spill Line Fax: (867) 873-6924

NWT 24-Hour Spill Line Email: spills@gov.nt.ca

Head office, New Discovery Mines Ltd. Phone: (867) 123-1111

Head office, New Discovery Mines Ltd. Fax: (867) 123-2222

Head office, 24 hr phone line Phone: (867) 123-3333

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

- Initiate spill containment by first determining what will be affected by the spill.
- Assess speed and direction of spill and cause of movement (water, wind and slope).
- Determine best location for containing spill, avoiding any water bodies.
- Have a contingency plan ready in case spill worsens beyond control or if the weather or topography impedes containment.

Specific spill containment methods for land, water, ice and snow are outlined below.

1) 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 than spills on water as contaminated soil can be more easily recovered. Generally spills on land occur during the late spring, summer or fall when snow cover is at a minimum. It is important that all measures be undertaken to avoid spills reaching open water bodies.

Dykes

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.

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.

2) Containment of Spills on Water

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

Booms

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

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.

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.

3) 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 shoveled 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.

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.

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 shoveled into barrels or bags.

Burning

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

4) 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 shoveling the contaminated snow into plastic bags or empty barrels, and storing these at an approved location.

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 shoveled into barrels or bags, or collected with sorbent materials.

5) Worst Case Scenarios

Dealing with spilled fuel which exceeds the freeboard of a dyke or barrier would present a possible worst case scenario for New Discovery Mines Ltd. site. To contain the overflow, a trench or collection pit would have to be created downstream of the spill to contain the overflow.

Another worst case scenario would be an excessive spill on water may be difficult to contain with the booms present at the site. In this case, an emergency response mobile unit would have to be called in to deal with the spill using appropriate equipment.

D. Procedures for transferring, storing, and managing spill related 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 clean-up. 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 Camp Unknown. 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 in Section C, 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.

E. Procedures for restoring affected areas

Once a spill of reportable size has been contained, New Discovery Mines Ltd. will consult with the INAC or lead agency Inspector assigned to the file to determine the level of cleanup required. The Inspector may require a site specific study to ensure appropriate clean up levels are met. Criteria that may be considered include natural biodegradation of oil, replacement of soil and revegetation.

4) Resource Inventory

i) On-site resources

Spill kits are located throughout the sites at the locations indicated in Figure 2. The contents are described below. In addition, earth moving and other equipment located at the proposed camp is also listed below.

Contents of Spill Kits

- 4 pairs of chemical master gloves
- 10 large bags with ties for temporary use
- 2 oil only booms (5" x 10')
- 50 oil only mats (16" x 20")
- 5 sorbent socks
- 10 sorbent pads
- 2 large tarps
- 1 roll duct tape
- 1 utility knife
- 1 field notebook and pencil
- 1 rake
- 1 pick axe
- 3 aluminum scoop shovels
- 1 instruction binder

Earth moving and other equipment

- 2 scoop trams
- 1 loader
- 2 end-dump trucks
- 1 small bulldozer
- 1 all-terrain vehicles
- 1 boat
- 1 chain saw

3 fuel transfer hoses with pumps tool kit including hack saw, hammer, screwdrivers, etc.

ii) Off-site resources

All the contacts listed below could reach the site in 2 hours at a minimum. However, realistically government officials would not be able to reach the site until the next business day, depending on the severity of the spill.

New Discovery Mines Ltd., 24-hour emergency line
(604) 818-1400

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

Aboriginal Affairs and Northern Development Canada (AANDC) Inspector
(867) 669-2794

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

GNWT Environmental Protection Division
(867) 873-7654

GNWT Environmental Health Office
(867) 669-8979

RCMP (Yellowknife)
(867) 669-1111

Medivac (Yellowknife)
(867) 669-4115

Great Slave Helicopters (Yellowknife)
(867) 873-2081

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

Arctic Sunwest (Yellowknife)
(867) 873-4464

As planning for an emergency situation is imperative due to the materials stored on-site and the remoteness of the site, an employee and contractor training program has been prepared. It is outlined below.

5) Training Program

i) Outline of training program

The employee and contractor training program was developed by the manager of environmental health and safety, and has been disseminated by the camp manager. The following are key steps in the program:

- all individuals entering the site are required to participate in an orientation session
- during this session, all locations of the spill plan and spill kits are provided on a map in hard copy
- an overview of the plan is provided by the camp manager leading the orientation session
- specific training sessions, including mock spill exercises, are scheduled for individuals directly involved in handling hazardous materials to ensure they know all steps to be undertaken in handling these materials, as well as the steps involved in the event of a spill, including the proper use of spill kits
- all employees and contractors are required to have their basic first aid training, as well as WHMIS training, before working on the site
- supervisors are required to have advanced level first aid training, as well as transport of dangerous goods training

ii) Training schedule and recordkeeping

A spreadsheet is kept by the camp manager and head office indicating the training undertaken, and expire dates of specific training e.g. first aid. It is regularly updated.

- diesel
- jet B
- gasoline
- propane

Appendix B-1: Material Safety Data Sheets (MSDS) for hazardous materials stored on site

The formats of Material Safety Data Sheets vary greatly. Examples can be found on the internet and from Spill Contingency Plans in place for various Water Licenses in the NWT (see Land and/or Water Board public registries).

Appendix B-2:

NT-NU Spill Report Form



Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 878-3824
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH - DAY - YEAR	REPORT TIME	<input type="checkbox"/> ORIGINAL SPILL REPORT OR		REPORT NUMBER
			<input type="checkbox"/> UPDATE # _____ TO THE ORIGINAL SPILL REPORT		_____
B	OCCURRENCE DATE: MONTH - DAY - YEAR		OCCURRENCE TIME		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)		WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION			REGION	
				<input type="checkbox"/> NWT <input type="checkbox"/> NUNAVUT <input type="checkbox"/> ADJACENT JURISDICTION OR OCEAN	
E	LATITUDE		LONGITUDE		
	DEGREES	MINUTES	SECONDS	DEGREES	MINUTES
F	RESPONSIBLE PARTY OR VESSEL NAME		RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED		CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES		U.N. NUMBER	
I	SPILL SOURCE		SPILL CAUSE		AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY		DESCRIBE ANY ASSISTANCE REQUIRED		HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS				
L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE
REPORT LINE USE ONLY					
N	RECEIVED AT SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLED	REPORT LINE NUMBER
		(STATION OPERATOR)		YELLOWKNIFE, NT	(867) 920-8130
LEAD AGENCY <input type="checkbox"/> EC <input type="checkbox"/> CGO <input type="checkbox"/> GWT <input type="checkbox"/> GN <input type="checkbox"/> LA <input type="checkbox"/> NAC <input type="checkbox"/> NEB <input type="checkbox"/> TO			SIGNIFICANCE <input type="checkbox"/> MINOR <input type="checkbox"/> MAJOR <input type="checkbox"/> UNKNOWN		FILE STATUS <input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED
AGENCY	CONTACT NAME	CONTACT TIME	REMARKS		
LEAD AGENCY					
FIRST SUPPORT AGENCY					
SECOND SUPPORT AGENCY					
THIRD SUPPORT AGENCY					

Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and faxed to the spill line at 867-973-6924. Commencing on January 2, 2007, the form can also be e-mailed as an attachment to spills@gov.nt.ca. Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call. Spills can still be phoned in by calling collect at 867-920-8130.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. Please do not fill in the Report Number: the spill line will assign a number after the spill is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. You must include the geographic coordinates (Refer to Section E).
E. Geographic Coordinates	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.
G. Contractor involved?	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
H. Product Spilled	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Whenever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1953 for Jet A & B)
I. Spill Source	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overflow, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m ²)
J. Factors Affecting Spill	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or equipment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
K. Additional Information	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. Please number the pages to ensure that recipients can be certain that they received all pertinent documents. If only the spill report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	Leave Blank. This box is for the Spill Line's use only.

Appendix B-3: Immediately Reportable Spill Quantities

TDG Class	Substance for NWT 24 Hour Spill Line	Immediately Reportable Quantities
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive Unknown substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	> 100 L

4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	> 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances excluding PCB mixtures	> 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	> 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	> 5 L or 5 kg
9.1	PCB mixtures of 5 or more ppm	> 0.5 L or 0.5 kg
None	Other contaminants (e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, waste water, etc.)	> 100 L or 100 kg
None	Sour natural gas (i.e. contains H ₂ S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

In addition, all releases of harmful substances, regardless of quantity, are to be reported to the NWT spill line if the release is near or into a water body, is near or into a designated sensitive environment or sensitive wildlife habitat, poses imminent threat to human health or safety, poses imminent threat to a listed species at risk or its critical habitat, or is uncontrollable.