HOPE BAY PROJECT

SPILL CONTINGENCY PLAN

January 2017

PLAIN LANGUAGE SUMMARY

This Plan describes the spill response procedures to be used at the TMAC Resources Inc. Hope Bay Project. This Plan ensures that 1) human life is protected and the potential for injury during spill response activities is minimized to the extent possible, 2) all potentially harmful environmental impacts are kept to a minimum, 3) resources are used effectively and efficiently, and 4) all required internal and regulatory reporting is completed on time and as required.

HOPE BAY EMERGENCY PHONE NUMBERS

Onsite Contacts	Day (7am to 7pm)	Night (7pm to 7am)
General Main Line/Emergency Line (Medic)	1-867-988-6882	1-867-988-6882
Surface Manager Kelly Schwenning	1-867-988-6882 ext. 106 Offsite Office: 1-604-947-9707	Offsite Cell: 1-604-209-1726
Surface Manager/Electrical Ron Bertrand	1-867-988-6882 ext. 101	Offsite Cell: 1-250-488-1217
Manager of Mining Paul Christman	1-867-988-6882 ext. 100	
Environmental Coordinator Sarah Warnock Amber Chelczynski	1-867-988-6882 ext. 102	
Site Services (Nuna) Project Manager	1-780-702-6879	
Offsite Contacts	**Day (7am to 7pm)**	**Night (7pm to 7am)**
V.P Environmental Affairs John Roberts	1-416-628-0216	1-416-522-5718
V.P Operations Floyd Varley	1-416-628-0216	416-986-1501
Environmental Advisor Katsky Venter	1-250-538-2306	1-250-538-2306
Chief Executive Officer (CEO) Catharine Farrow	1-416-628-0216	
President Gordon Morrison	1-416-628-0216	
Director, External and Community Affairs, Cambridge Bay Alex Buchan	1-867-983-2385	1-867-445-6675
Director Environmental Affairs Oliver Curran	1-416-577-5829	1-416-577-5829

SITE RADIO CHANNELS

Channel 1	Emergency
Channel 3	Aviation
Channel 4	Roads
Channel 5	Site Services
Channel 6	Medic
Channel 7	Environment Department

KEY GOVERNMENT CONTACTS

Organization		Location	Telephone	Fax
NT-NU Spill Centre	24 hour Spill Report Line	Yellowknife	867-920-8130	867-873-6924
Canadian Coast Guard – Central and Arctic Region (Any discharge to the marine environment during fuel transfer between vessel and OHF)	24 hour Spill Report Line	Yellowknife	800-265-0237	
GN Department of Environment	Director Environmental Protection Division	Iqaluit	867-975-7729	
Nunavut Water Board	Executive Director	Gjoa Haven	867-360-6338	867-360-6369
Kitikmeot Inuit Association (KIA)	Sr. Lands Officer	Kugluktuk	867-982-3310	867-982-3311
INAC (Indigenous and Northern Affairs Canada)	Field Operations Manager	Iqaluit	867-975-4295	
INAC (Indigenous and Northern Affairs Canada)	Inspector	Yellowknife	867-669-2438	867-669-2702
ECCC (Environment and Climate Change Canada)	Manager of Enforcement	Yellowknife	867-669-4730	867-669-6831
ECCC (Environment and Climate Change Canada)	Environmental Assessment Officer	Yellowknife	867-669-4766	
DFO (Fisheries & Oceans Canada)	Habitat Team Leader	Ottawa	705-522-9909	

OFFSITE RESOURCE CONTACTS

Organization	Contact	Location	Telephone
Mackenzie Delta Spill Response Corporation	Tim Taylor	Inuvik	403-370-7887
Riverspill	Ian Lambton	Burnaby	604-434-0994

IMMEDIATELY REPORTABLE SPILLS

Per Schedule B of the NU Spill Contingency and Reporting Regulations.

Description of Contaminant	Amount Spilled	TDG Class
Explosives	Any amount	1.0
Compressed gas (toxic/corrosive)		2.3 / 2.4
Infectious substances		6.2
Sewage and Wastewater (Unless otherwise authorized)		6.2
Radioactive materials		7.0
Unknown substance		None
Compressed gas (Flammable) Compressed gas (Non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100L	2.1 2.2
Flammable Liquid	≥ 100L	3.1 / 3.2 / 3.3
Flammable Solid Substances liable to spontaneous combustion Water reactant substances	≥ 25kg	4.1 4.2 4.3
Oxidizing substances	≥ 50 L or 50 kg	5.1
Organic peroxides Environmentally hazardous substances intended for disposal	≥ 1 L or 1 kg	5.2 9.0
Toxic substances	≥ 5 L or 5 kg	6.1
Corrosive substances Miscellaneous products, substances or organisms	Not defined	8.0 9.0
PCB mixtures of 5 or more ppm	≥ 0.5 L or 0.5 kg	9.0
Other contaminants – for example, crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater.	≥ 100 L or 100 kg	None
Sour natural gas (i.e. contains H_2S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more	None
Flammable liquid Vehicle fluid	≥ 20 L when released on a frozen water body that is being used as a working surface	
Reported releases or potential releases of any substance that: 1. are near or in an open water body (freshwater or marine); 2. are near or in a designated sensitive environment or habitat; 3. Pose an imminent threat to human health or safety; or 4. Pose an imminent threat to a listed species at risk or its critical habitat		

In the event that a particular material spill meets or exceeds the amount specified or conditions outlined in the above table the Environmental Coordinator will immediately report the spill by telephone to the NT-NU 24 Hour Spill Report Line, Yellowknife, Tel: 867-920-8130 (Email: spills@gov.nt.ca; Fax: 867-873-6924) using the NT-NU Spill Report. Any spill or discharge that occurs to the marine environment must immediately be reported to the regional Canadian Coast Guard station at Tel: 800-265-0237.

FIRST RESPONDER

When someone on site sees an unanticipated discharge or spill, he or she is immediately designated as the First Responder and, as such, shall complete the following actions

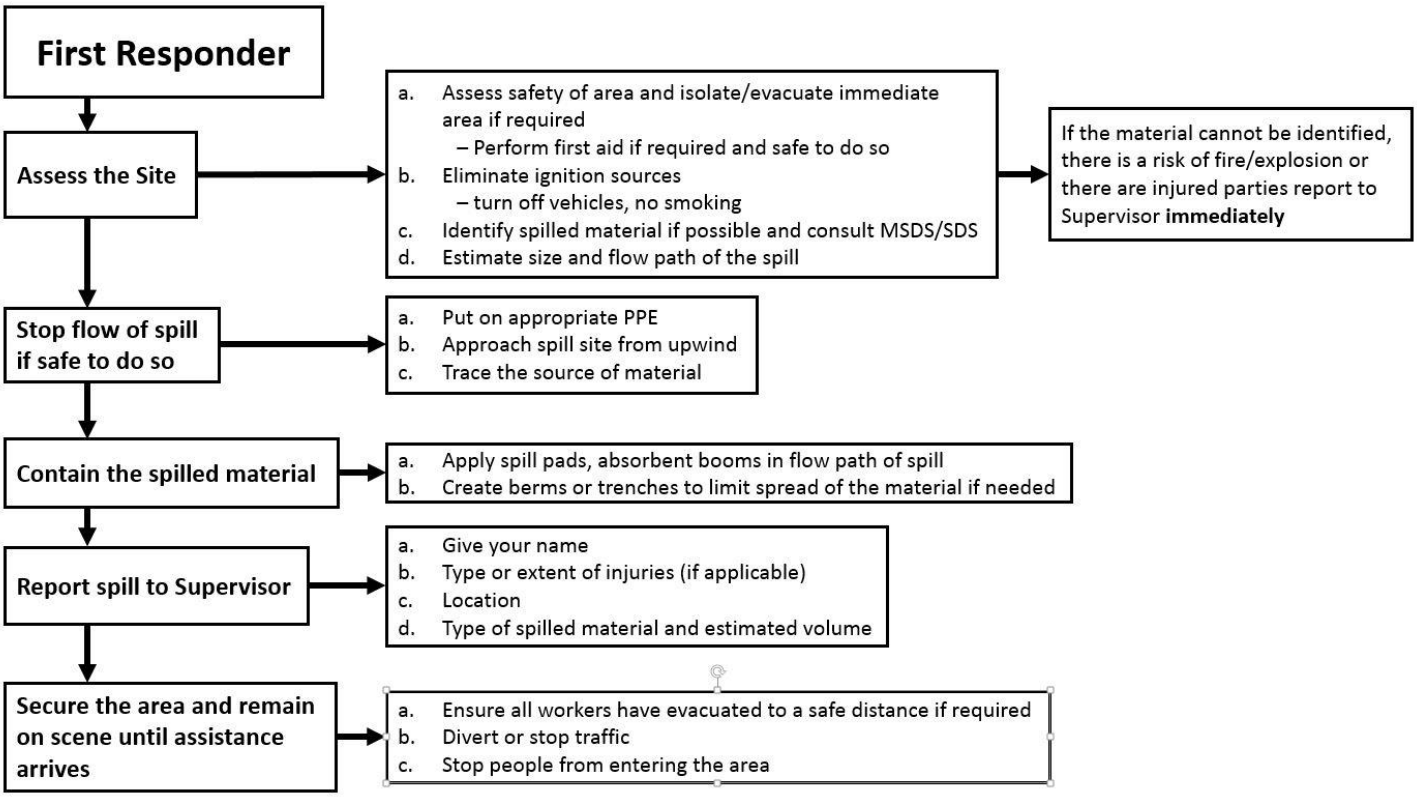

Figure 1: First Responder Spill Response Actions

SPILL RESPONSE ORGANIZATION STRUCTURE

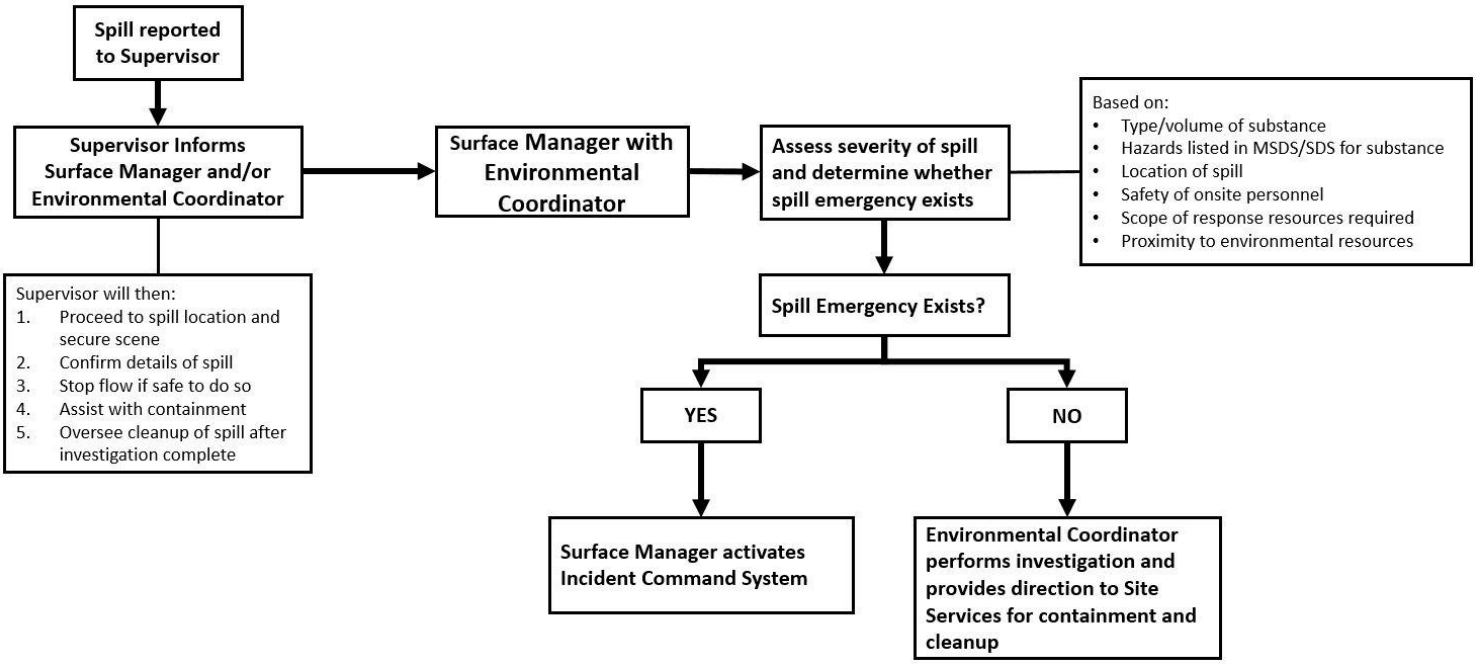

Figure 2. Spill Response Organizational Structure

SPILL EMERGENCY INCIDENT COMMAND SYSTEM

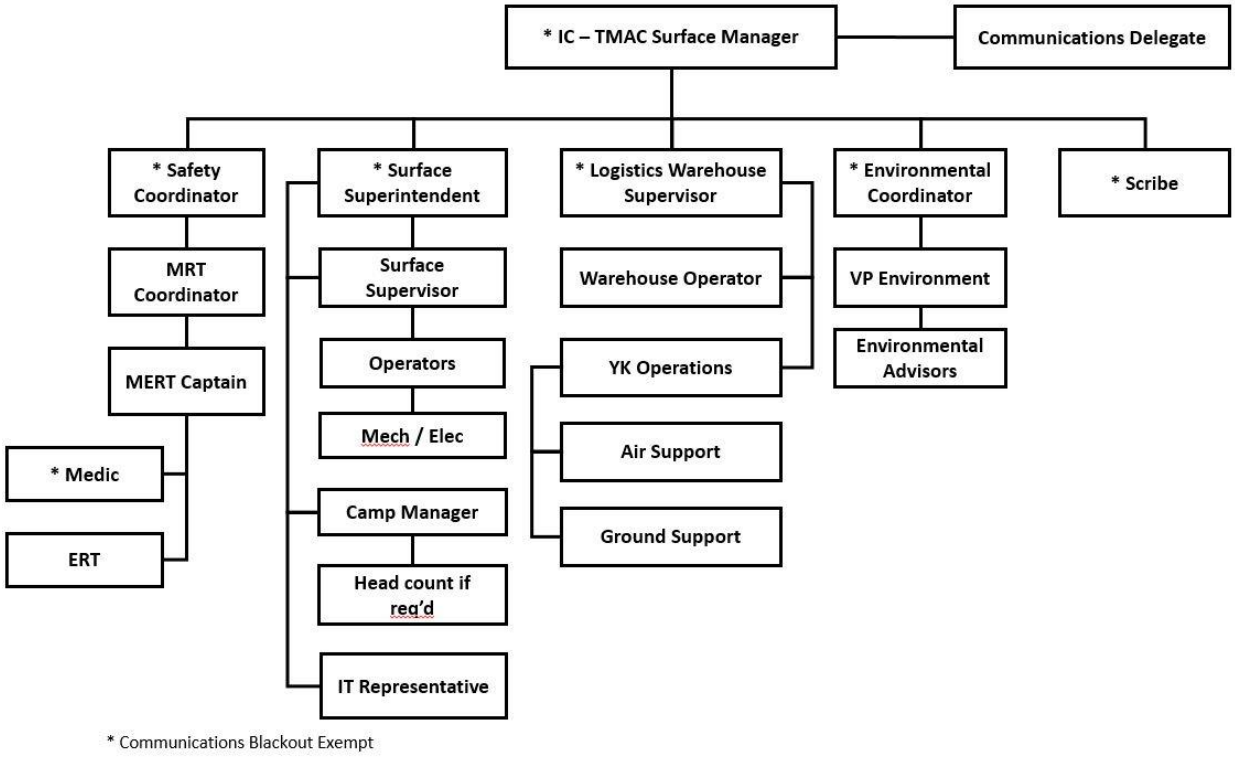

Figure 3. Incident Command System organizational structure in the event of a spill emergency.

REVISION RECORD

Revision #	Date	Section	Summary of Changes	Author	Approver
1	2009		Hope Bay Project Spill Contingency Plan, August 2009	SRK Consulting	HBML
2	Feb. 2010		Update phone numbers	SRK Consulting	
3	July 2010		Update phone numbers	SRK Consulting	
4	2011	Throughout	Update channels, figures, included OPPP info, updated phone numbers, revised fuel storage locations	SRK Consulting	Newmont
5	2012	Throughout	Overall revision for change to Care and Maintenance. Updated roles and responsibilities, phone numbers, fuel storage, added non-hydrocarbon chemicals, updated spill response procedures	HBML	Newmont
6	2014	Throughout	Overall revision to include Care and Maintenance under ownership of TMAC Resources Inc. Updated roles and responsibilities, contact information, fuel storage, updated spill response procedures	TMAC	TMAC
7	April 2016	Throughout	Updated to reflect comments on 2014 Plan and other stakeholder inputs. Changes to document structure and addition of licence specific modules and Incident Command System response structure. Revisions to reflect Construction and Operations phases for Doris and anticipated chemical storage quantities. Inclusion of Product-specific response plans, updated contacts.	TMAC	TMAC
8	January 2017	Throughout	Revisions in consideration of comments on 2016 Plan, and in consideration of planned resumption of exploration activity at Boston	Katsky Venter	TMAC

GLOSSARY AND ACRONYMS

TERM	DEFINITION
CWS	Canadian Wildlife Services
DoE	Department of Environment
ECCC	Environment and Climate Change Canada
ERT	Emergency Response Team
ERP	Emergency Response Plan
GN	Government of Nunavut
IC	Incident Commander
ICS	Incident Command System
KIA	Kitikmeot Inuit Association
MSDS/SDS	Material Safety Data Sheet/Safety Data Sheet
NWB	Nunavut Water Board
PSSR	Product Specific Spill Response
PPE	Personal Protection Equipment
VPO	Vice President of Operations

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1. INTRODUCTION

This Hope Bay Spill Contingency Plan (the Plan) has been prepared by TMAC Resources Inc. (TMAC) in accordance with three Nunavut Water Board (NWB) water licences held by TMAC associated with developments throughout the Hope Bay region.

The Plan is intended primarily for use by TMAC and its contractors to ensure that best practices for response are implemented in the event of a spill or unintentional release, and that the conditions of water licences and project permits are met.

This Plan is structured in a manner such that one document pertaining to spill response is approved and implemented across all TMAC Hope Bay project sites, while still addressing site- and licence-specific needs: the main document outlines TMAC's approach to spill response planning and management as it pertains to all TMAC Hope Bay developments; subsequent modules provide details for each site and the associated water licence. In the event of a new water licence, or an existing licence amendment, only the specific modules pertaining to that licence and site may need to be revised. This is intended for consistency and efficiency across operations and for compliance management.

This Plan has been developed to be applicable for all phases of the various Hope Bay Belt projects. This Plan is reviewed annually and updated as necessary.

1.1. OBJECTIVES

TMAC's vision and values which strive for zero harm are protective of people and the environment. Safe work procedures and training provided to all employees promote best practices and sound environmental management; however, the potential exists for unanticipated discharges or spills to occur during the course of operations. TMAC recognizes that prompt, effective and organized responses to an unanticipated discharge or spill will enhance the health and safety of all employees, minimize the potential adverse environmental impacts resulting from such an event, and ensure effective communication with the appropriate regulatory agencies and the general public. Consistent with TMAC's intent to be a responsible operator, these objectives are described as follows:

- Provide procedures for every employee should he/she identify an unanticipated discharge or spill;
- Define roles, responsibilities and procedures for spill response actions, documentation, reporting, incident investigation and review following an event;
- Outline a process to be followed when conducting spill clean-up activities to promote safe and effective recovery of spilled materials and minimize impacts to the environment;
- Provide information on available resources and potential operational hazards/risks that may be encountered during spill response activities;
- Define methods to provide spill response training for all employees, and;
- Implement a process to evaluate and continuously improve site spill response procedures

1.2. RELEVANT LEGISLATION AND GUIDANCE

Table 1 Regulations and Guidelines governing the Hope Bay Spill Contingency Plan

Regulation/Guideline	Year	Governing Body	Relevance
Guidelines for Spill Contingency Planning	2007	Indian and Northern Affairs Canada, Water Resources Division	Provides guidelines and requirements for the

			development of spill contingency plans
Environmental Protection Act	1999	Environment Canada	Spill contingency planning and reporting regulations (Section 34)
Environmental Emergency (E2) Regulations	2011	Environment Canada	Outlines requirements for hazardous materials emergency planning

1.3. RELATED TMAC DOCUMENTS

The documents listed in Table 2 are expected to be referenced and utilized in conjunction with the Spill Contingency Plan.

Table 2 List of TMAC documents Related to the Hope Bay Spill Contingency Plan

Document Title	Year	Relevance
Hazardous Waste Management Plan	2012	Describes proper handling, storage and disposal procedures for hazardous wastes.
Non-Hazardous Waste Management Plan	2012	Describes proper handling, storage and disposal procedures for non-hazardous wastes.
Hope Bay Project Landfarm Management and Monitoring Plan	2017	Describes process for remediating hydrocarbon contaminated soil, water and gravel and criteria for determining level of remediation.
Surface Emergency Response Plan	(in prep.)	Describes Incident Command System and actions relating to all surface emergencies. This Plan will replace the current ERP (2014).
Doris North Tailings Operations, Management and Surveillance (OMS) Plan	(in prep.)	Describes the tailings management procedures and the aspects of the pipelines designed to reduce spills of tailings and effluent.

1.4. PLAN MANAGEMENT

The Vice President of Operations (VPO) has the overall responsibility for implementing this management plan and will provide the on-site resources to respond to unanticipated discharges and spills that occur in the Hope Bay Belt in accordance with this plan.

The Surface Manager is responsible for implementing this plan at the Hope Bay site, and providing on-site support and resources for spill response management. The Surface Manager will act as Incident Commander (IC) in the event that a spill occurs that requires activation of the Emergency Response Plan (ERP). As Incident Commander, the Surface Manager will coordinate the spill response efforts that protect the health and safety of all responders, and minimizes impacts to the environment.

The Environmental Coordinator is responsible for revising this plan and will investigate spill incidents, develop corrective actions for those incidents as necessary, maintain records of all spill events, and complete appropriate reporting as required by TMAC policies and relevant regulations as identified in this plan. The Environmental Coordinator will also conduct and record regular inspections of spill response resources. In the event that a spill requires activation of the Emergency Response Plan, the Environmental Coordinator will provide guidance to the Surface Manager regarding implementing response actions according to this plan and evaluating priorities for protection of sensitive habitats/species and archeological features at risk.

1.5. PLAN IMPLEMENTATION

In accordance with the requirements of the General Conditions (Part B) of the applicable water licences, this plan will be immediately implemented following its submission, subject to any modifications proposed by the NWB as a result of the review and approval process.

This plan will be reviewed annually and updated as necessary to capture changes to site operational structure/contacts, response technologies or applicable legislation and regulations.

1.6. PROJECT DESCRIPTION

The Hope Bay Project (the Project) is a gold mining project located in the West Kitikmeot region of Nunavut approximately 125 km southwest from Cambridge Bay and 75 km northeast from Umingmaktok. The various elements of the Hope Bay Project are centred at approximately N 68° 09' and W 106° 40' and extend from the head of Roberts Bay (an extension of Melville Sound) at the north end of the Project to south of the Boston site located approximately 60 km to the south. The jetty extends into Roberts Bay and is located on foreshore Crown Land. The Hope Bay mineral exploration rights property comprises an area of 1078 km^2 and forms a contiguous block that is approximately 80 km long by up to 20 km wide. Descriptions of project infrastructure pertinent to each licence area are provided in the appended modules.

The Hope Bay Project area has a low arctic eco-climate and consists of coastal lowland habitats with numerous fresh water lakes and ponds. The drainage basins are generally long and narrow and predominately oriented along the north-south axis and are separated by bedrock ridges. Continuous permafrost covers the project area with a surficial active layer of approximately 1 m. Groundwater movement only occurs in the shallow active layer during the seasonal thaw period and within the talik zones (unfrozen ground underlying larger water bodies). Permafrost underlying the area is generally impervious to groundwater movements.

2. SPILL RESPONSE AND MANAGEMENT

2.1. SPILL INCIDENT ALERTS

Any person on the Hope Bay Project site who comes across or sees an unanticipated discharge or spill is designated as the First Responder and will complete the following actions (Figure 1):

1. Assess the Site
    a. Assess safety of area and isolate/evacuate immediate area if required
    b. Perform first aid if required and safe to do so
    c. Eliminate ignition sources – turn off vehicles, no smoking
    d. Identify spilled material if possible and consult MSDS/SDS
    e. Estimate size and flow path of the spill

   NOTE: If the material cannot be identified, there is a risk of fire/explosion or there are injured parties report to Supervisor **immediately** (Step 4)**.**
2. Stop flow of spill if safe to do so
    a. Put on appropriate PPE
    b. Approach spill site from upwind
    c. Trace the source of material
3. Contain the spilled material
    a. Apply spill pads, absorbent booms in flow path of spill
    b. Create berms or trenches to limit spread of the material is needed
4. Report spill to Supervisor
    a. Give you name
    b. Type or extent of injuries (if applicable)

   c. Location
   d. Type of spilled material and estimated volume
5. Secure the area and remain on scene until assistance arrives
   a. Ensure all workers have evacuated to a safe distance if required
   b. Divert or stop traffic
   c. Stop people from entering the area.

All personnel receive appropriate training during their initial site orientation of what to do when he/she sees an unanticipated discharge or spill anywhere at the Hope Bay site. A flow-chart summarizing the First Responder spill actions is provided in Figure 1 as a quick reference at the beginning of this plan and is available in all spill kits on site.

2.2. SPILL RESPONSE ORGANIZATIONAL STRUCTURE

Once a spill has been identified by the First Responder the following spill response organizational structure will be implemented. The responsibilities of the individuals involved in spill response actions is summarized in the sections below. A flow-chart summarizing this structure is provided in Figure 2 as a quick reference at the beginning of this plan.

2.2.1. SUPERVISORS

In the event that a Supervisor is informed of a spill by an employee, he/she will immediately inform the Surface Manager or Environmental Coordinator that a spill has occurred and provide details of the spill as outlined in Section 2.1 above. The Supervisor will proceed to the spill location, secure the scene, confirm the type of material/size of the spill and assist with containment actions. Depending on the severity of the spill incident, either the Surface Manager or Environmental Coordinator will provide direction to the Supervisor regarding the removal, storage and disposal of the spilled material. The incident scene is not to be disturbed until an incident investigation can be completed. Removal and disposal of spill materials is only to be conducted after this investigation is complete and the scene is released by the Surface Manager and/or Environmental Coordinator.

2.2.2. SURFACE MANAGER

Once notified of the spill, the Surface Manager will consult with the Environmental Coordinator to assess the severity of the spill incident and determine whether a spill emergency exists that requires activation of the Incident Command System (ICS) emergency procedures. This assessment will take into account the type and volume of the substance that has spilled, the location of the spill, safety of site personnel, scope of resources required to respond and the proximity of the spill to environmental resources at risk, including water bodies, sensitive habitat, archeological sites or sensitive species in the area.

The ICS is a command structure used in the Emergency Response Plan (ERP) at the Hope Bay site. This structure is designed to have a documented sequence of decisions that has been reviewed in advance of an emergency situation and establishes a chain of command to minimize confusion, so that employees will have no doubt who has the authority for making decisions.

If the ICS is activated in response to a spill emergency, the Surface Manager becomes the Incident Commander and implements the ICS command system outlined in Figure 3 at the beginning of this plan. The Incident Commander will communicate with onsite managers and direct all efforts in the spill response including evacuating personnel, identifying resources required to respond to the incident and activating the Emergency Response Team (ERT). The Incident Commander will direct Site Services to complete containment and clean-up actions based on safety of the responders and environmental protection priorities as identified by the Safety Coordinator and Environmental Coordinator. In the event of a large spill, the Incident Commander may direct the Logistics Warehouse Supervisor to secure off-

site resources and facilitate shipment to the Hope Bay site. The Incident Commander will establish communications with the offsite Public Relations Delegate and regularly brief this individual on the status of the spill emergency. A scribe will be assigned to the Incident Commander to document all communications and response actions of the spill incident.

After the spill emergency has been contained, the Incident Commander will conduct an incident investigation with the assistance of the Environmental Coordinator, Safety Coordinator and other site managers as required.

If the spill is not deemed an emergency by the Surface Manager, the ICS will not be activated and the Environmental Coordinator will provide direction to Site Services for containment and clean-up of the spill after an incident investigation has been completed.

2.2.3. ENVIRONMENTAL COORDINATOR

The Environmental Coordinator will assist the Surface Manager in evaluating the severity of a spill situation to determine whether a spill emergency exists. The Environmental Coordinator will identify environmental resources at risk, including water bodies, sensitive habitat and species, or archeological sites in proximity to the spill based on the size/location of the spill, anticipated path of flow and weather conditions at the time. If a spill emergency exists that triggers the ICS, the Environmental Coordinator will advise the Incident Commander on the prioritization of containment and clean-up efforts. If the ICS is not triggered, the Environmental Coordinator will provide direction to Site Services for containment and clean-up of the spill after an incident investigation has been completed.

The Environmental Coordinator will document and investigate the cause of all spills, and work with onsite managers to develop corrective actions as required to prevent a repeat occurrence of the incident.

The Environmental Coordinator is also responsible for reporting of incidents as outlined in Section 3 of this plan and implementing follow-up monitoring actions deemed necessary to evaluate the extent of the spill and effectiveness of clean-up/remediation efforts. The Environmental Coordinator will communicate with the Vice President of Environmental Affairs and the Environmental Advisor at any time as required to determine effective clean-up measures, discuss reporting submissions and implement environmental monitoring as necessary.

2.2.4. COMMUNICATIONS DELEGATE

In the event of a spill emergency, a Communications Delegate will be identified by TMAC Executive, and will communicate regularly with the Incident Commander to monitor the spill response and maintain a log of internal and external communications. The Communications Delegate will inform all appropriate agencies, which may include the Kitikmeot Inuit Association, the Nunavut Water Board, the Nunavut Impact Review Board, Environment and Climate Change Canada, Indigenous and Northern Affairs Canada, the Department of Fisheries and Oceans Canada and advise the public in the immediate vicinity of the spill if warranted. The Communications Delegate may designate alternative personnel to perform these communications. This individual will also update the TMAC Executive as required.

2.2.4.1. SPILL RESPONSE COMMUNICATIONS

During a spill emergency, on-site staff WILL NOT communicate directly with regulatory agencies, the press or other parties off of the mine site. All external communication is to be through the Communications Delegate. Communication systems will be shut down at the direction of the Incident Commander and only emergency radio and phone lines identified in the Incident Command organizational structure will remain operational.

All on-site communication with the Communications Designate will occur through or at the direction of the Incident Commander. On-site communications will use portable radios on designated radio

channels. Independent satellite phones are available for crews for emergency communications in the unlikely event that the radio and phone systems fail.

2.3. Spill Response Actions

Most chemicals appropriately labelled and stored onsite are kept in small quantities and not expected to result in a major spill incident. Any chemical which is a product listed under the Environmental Emergency Regulations (E2) and which will be stored in quantities on site equal to or greater than that listed in the E2 Schedule 1 will have an additional Product Specific Spill Response (PSSR) Plan detailed for that product. These PSSR plans can be found in Appendix A of this document.

The product label will be used to identify the substance and hazards, the Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS) will be consulted to determine the proper PPE requirements and appropriate spill response procedures. The following sections outline general spill response actions to be taken in the event of a spill in each associated environment. The basic spill response steps to be taken in the event of the spill are illustrated in **Error! Reference source not found.** below.

Note that some substances can be highly reactive in contact with water, air, or other substances and should not be addressed unless safe to do so. Chemical reactivity and associated hazards can be assessed through a program found here: http://response.restoration.noaa.gov/chemaids/react.html.

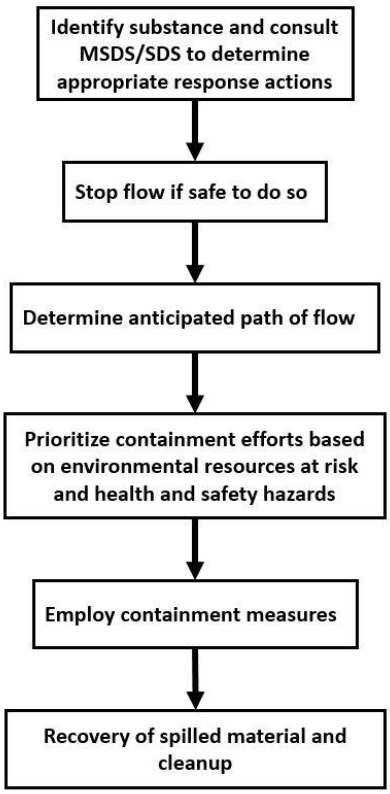

Figure 4. General spill response actions

2.3.1. SPILLS ON LAND AND WATER

In the event of a liquid spill on gravel, rock, soil or vegetation, it is very important to prevent the liquid from entering any body of water where it will spread and likely have greater environmental impact. Liquid spills on land will be contained and cleaned up by:

- Covering the spill with appropriate absorbent pads and placing absorbent booms in the path of flow of the spill
- Constructing temporary berms from soil or snow at the leading edge of the spill to minimize flow
  - Plastic tarps can be placed over and at the foot of the berm to capture pooling liquid and facilitate recovery
  - Temporary berms are an interim measure and will be removed as soon as possible after the spill is contained and remedial actions complete
- Pumping spilled material to empty drums or tanks
- Using a vacuum truck to recover spilled material
- Excavators and other heavy equipment may be used to excavate contaminated materials
- If safe to do so, blow torches (Tiger Torches) may be used to clean small hydrocarbon spills that occur on unlined areas of the camp pad to reduce waste generation and handling

In the event of a spill on water, the spread of the spilled material will be limited to the extent possible. The following steps will be taken to contain and clean-up a spill on water:

- Identify the direction and speed of the flow path of the product based on weather conditions and drainage patterns
  - Monitor the spread of the material from helicopter if possible to identify the area of spread
- Use appropriate absorbent pads, socks and similar materials to recover spilled product
  - Granular sorbent materials are NOT to be used for spill response on water
- Hydrophobic absorbent booms will be deployed to contain large spills and to facilitate recovery
  - Absorbent booms will be drawn slowly in to encircle the spilled product and absorb it
  - High winds, waves and other factors may limit the effectiveness of these materials
- Skimmers will be deployed in open-water areas to remove product from the water surface and boards or plywood may be used in streams or culverts to reduce the flow of spilled product on the surface and limit the area of the spill on the water
- Use of sub-surface barriers to contain spilled product that may sink
- Pump contaminated water into tanks or storage bladders if possible
  - A vacuum truck may be used to recover spilled product
- Contaminated substrate and vegetation will be removed either manually or with the use of heavy equipment if feasible
- Chemical dispersants should not be used as a spill response technique at the Hope Bay project, seek direction from VP Environment

Also see section 4.5 of this document for guidance related to additional spill protection, clean-up, and reporting measures for environmentally sensitive species and archaeological sites.

2.3.2. SPILLS IN A MARINE ENVIRONMENT

The most effective way to minimize environmental damage is to focus on source control and to prevent product from spreading. The following steps will be taken in the event of a spill in the marine environment:

- Identify the direction, speed and flow path of the product based on weather conditions and drainage patterns
  - Monitor the spread of the material by helicopter if possible to identify the area of spread
- Use of appropriate absorbent pads, socks and similar materials to recover small volumes of spilled product

    - Floating spill response booms will be used to encircle a barge prior to off-loading chemicals and fuel from the barge as a precautionary measure
- Use appropriate absorbent pads, socks and similar materials to recover spilled product
    - Granular sorbent materials are NOT to be used for spill response on water
- Hydrophobic absorbent booms will be deployed to contain large spills and to facilitate recovery
    - Absorbent booms will be drawn slowly in to encircle the spilled fuel and absorb it
    - High winds, waves and other factors may limit the effectiveness of these materials
- Skimmers will be deployed in open-water areas to remove product from the water surface
- Use of sub-surface barriers to contain spilled product that may sink
- Pump contaminated water into tanks or storage bladders if possible
- Chemical dispersants should not be used as a spill response technique at the Hope Bay project, seek direction from VP Environment

Also see section 2.3.10 of this document for guidance related to additional spill protection, clean-up, and reporting measures for environmentally sensitive species and archaeological sites.

Spill response measures specific to bulk fuel offloads completed at Roberts Bay are detailed in the Hope Bay Ocean Pollution Prevention Plan/Oil Pollution Emergency Plan (OPPP/OPEP). The OPPP/OPEP is the main document of reference for spill control actions during a fuel offload at the Hope Bay project and is revised annually.

2.3.3. SPILLS ON SNOW

Spills on snow will be contained and recovered by:

- Use of appropriate absorbent pads, socks and similar materials to recover spilled product
- Compacting the snow into snow-berms and placing a liner of plastic sheeting at the toe and over the berm to collect spilled material and facilitate recovery
- Using the snow as a natural absorbent to collect spilled product
- An excavator, grader or other heavy equipment may be used to scrap up contaminated snow to be stored in a lined containment area or placed in steel drums

2.3.4. SPILLS ON ICE

Spills on ice will be contained and cleaned up by:

- Use of appropriate absorbent pads, socks and similar materials to recover spilled product
- Creating snow-berms by compacting snow around the edge of the spill and placing a liner of plastic sheeting at the toe and over the berm to collect spilled material and facilitate recovery
- Scraping contaminated snow/ice from the ice surface and placing in lined containment
    - Snow may act as a natural absorbent to collect spilled product
- In broken-ice conditions a skimmer may be used to collect product on the surface of open-water areas
    - Caution must be used when conducting spill response efforts in broken-ice situations. An appropriate safety plan and PPE must be determined before initiating these actions
- An excavator, grader or other heavy equipment may be used to scrap up contaminated ice to be stored in a lined containment area or placed in steel drums
    - A vacuum truck may be employed to recover large volumes of spilled material

2.3.5. SPILLS UNDER ICE OF SUBSTANCES THAT FLOAT

1. Hydrocarbon spills under ice will be addressed by:

- An appropriate safety plan and PPE must be determined before initiating these actions
- Testing of the ice to ensure thickness is safe for personnel to work on the surface

- Once ice has been deemed safe, slots will be cut in the ice surface in the area surrounding the spill and downstream of the anticipated direction of flow/spread
  - Contaminant will rise to the surface within the slots
  - Determine the direction of any currents (if expected; this would not be the case in an ice-covered lake) to identify the direction of flow and conduct ice profiling beyond the extent of the spill to identify any spread of the contaminant
- Contaminant will be skimmed/scooped out from within the slots and placed into empty pails/drums as it is recovered
- Pockets within the ice where contaminants can pool will be identified (this applies to ice which may have buckled areas where spills may pool; largely an ocean occurrence)
- Appropriate absorbent pads and booms will be used to contain spill if there is water moving past the ice edge (if any) where the spill took place
  - Set booms ahead of the spill based on the direction of anticipated flow
- A vacuum truck may be employed to recover larger volumes of spilled material or utilizing an Auger and pump system to pump spilled material into containers (e.g. drums)

2.3.6. SPILLS UNDER ICE OF SUBSTANCES THAT SINK

- Response to spills below ice of substances which sink will be evaluated on a quantity, substance-specific, and risk basis. In many circumstances, particularly for small releases of non-toxic substances, the appropriate response may solely be to limit discharge as soon as possible and safe to do so. TMAC will assess each individual situation and may consult a remediation specialist for advice in addition to discussions with the KIA, AANDC, DFO, and Environment Canada, where appropriate.
- Allowing substance to settle with minimal disturbance to limit spread (for waterbodies without current)
- A vacuum truck may be employed to recover larger volumes of spilled material or utilizing an Auger and pump system to pump spilled material into containers (e.g. drums)
- Use of sub-surface barriers to contain spilled product if there is water moving past the ice edge (if any) where the spill took place
- Appropriate subsurface containment will be used to contain spilled material if there is water moving past the ice edge (if any) where the spill took place

2.3.7. SPILLS UNDER ICE OF SUBSTANCES THAT DISSOLVE

- Response to spills below ice of substances which dissolve will be evaluated on a quantity, substance-specific, and risk basis. In many circumstances, particularly for small releases of non-toxic substances, the appropriate response may solely be to limit discharge as soon as possible and safe to do so. TMAC will assess each individual situation and may consult a remediation specialist for advice in addition to discussions with the KIA, AANDC, DFO, and Environment Canada, where appropriate.
- A vacuum truck or an Auger and pump system may be used to pump contaminated water into containers (e.g. drums) if rate of dissolution is slow enough/contaminated water volume is small enough to make this feasible
- For Sodium Cyanide spills see substance-specific spill response plan in Appendix A

2.3.8. SPILLS OF COMPRESSED GAS

If an accidental release of compressed gas occurs:

- Stop the source if safe to do so
- Ventilate the area well to dilute the gas
- Cordon off the area to prevent accidental ignition, explosion or inhalation by personnel
- Only employees with proper training and PPE will attempt to mitigate the release

2.3.9. BURNING SPILLS

Small spills of hydrocarbons (<100L) may be removed from unlined camp pad areas by using a propane torch. This response method would reduce the waste production and handling/storage of contaminated materials associated with the spill, and would reduce the risk of spreading or contaminating other areas during transport of these materials. No water would be used and no waste would be deposited to water as a result of this response method.

Extra safety precautions must be taken prior to the use of a propane torch in the event of a spill. The MSDS/SDS for the product will be reviewed to check for the reaction of the substance to heat. PPE such as Fire Resistant clothing and the proper gloves and respirator will also be worn and a spotter with a fire extinguisher rated for the type of spill and fire must be present during the clean-up.

Burning of larger spills may be considered on a case by case basis and only once TMAC has consulted with and received approval from ECCC, the KIA, the INAC Inspector and any other associated regulatory agencies. This method of response is only useful if quick action is possible, and prior to natural spill dispersal and loss of the more ignitable hydrocarbon fraction.

2.3.10. SPILLS AFFECTING ENVIRONMENTALLY SENSITIVE SPECIES OR ARCHEOLOGICAL SITES

The Hope Bay Project contains a number of habitats, species and sites of archeological and historical importance. The possibility exists for a spill to impact these environmental and cultural resources.

TMAC and previous companies operating on the Hope Bay site have conducted numerous ecological surveys to identify these areas at risk, with the focus of identifying those areas immediately surrounding Project infrastructure which are at greatest risk of impact from a spill.

In the event that a spill enters the natural environment, the Environmental Coordinator may use maps identifying these sensitive areas to prioritize the protection of these resources. Prioritization of environmental sensitivities will not be at the expense of safety or of reaching or maintaining control of the release. Sensitivity maps are provided in Appendix C.

Should decisions be required which protect some sensitive areas at the expense of others, the hierarchy of protection will attempt to favour:

waterbodies > sensitive habitat types

> archaeological sites > rare plants>active raptor nest or den

except as directed otherwise by regulatory agencies.

For spills in water, prioritization will attempt to avoid vegetated and finer substrate shoreline areas (sand, gravel and cobble) from which recovery is most difficult and which may be of high value to fish.

All of the communications outlined in this section would occur in addition to any appropriate spill reporting outlined in Section 3.

2.3.10.1. MITIGATION OF IMPACTS TO WILDLIFE

All reasonable measures will be taken to deter wildlife from coming into contact with any spilled material. In the event that wildlife does come in contact with a spilled material, TMAC will contact the Kitikmeot Inuit Association and either Environment and Climate Change Canada (ECCC) (in the case of migratory birds (does not include raptors)) or Government of Nunavut Wildlife Officers (in the case of other animals) to inform them of the impact and determine an appropriate course of action. In cases

where wildlife can be rescued, wildlife spill response experts will be contacted for assistance and guidance.

2.3.10.2. MITIGATION OF IMPACTS TO BIRDS

In the event that a contaminant is released to a body of water, initial wildlife response measures will be exercised in alignment with the *Birds and Oil-CWS Response Plan Guidance* document if migratory birds are or may be impacted. Environment and Climate Change Canada's Canadian Wildlife Service (ECCC-CWS) will be consulted to determine response strategies including the most appropriate humane treatment of oiled wildlife. Initial wildlife responses measures should include:

- Hazing to deter wildlife from using spill area
  - Watercraft
  - Sound makers such as whistles or horns
  - Helicopter* (if available and safe to do so)
- Wildlife monitoring
  - Assessment surveys for oiled and unoiled wildlife
  - Wildlife observers will be on vessels and aircraft if possible
- Bird Collection*
  - To collect dead and live birds within the spill area and adjacent. All response vessels should be equipped with dip nets, large plastic collecting bags to hold dead birds, and cloth bags or cardboard boxes to hold live oiled birds.

*The use of aircraft to deter migratory birds and the collection of live and dead birds require an authorization from ECCC-CWS.

2.3.10.3. MITIGATION OF IMPACTS TO ARCHEOLOGICAL FEATURES AND SENSITIVE HABITATS

If a spill is determined to have impacted any archeological or historic resources, prior to removing soil or vegetation, TMAC will immediately contact the Project Archaeologist. The Project Archaeologist will provide advice on next steps, and may travel to site to mitigate the archeological site. The Archeologist will also coordinate permits and communications with the Government of Nunavut Territorial Archaeologist.

In the event that shoreline substrates or aquatic vegetation have been impacted, TMAC will contact Environment and Climate Change Canada and the Department of Fisheries and Ocean for advice prior to initiating removal.

2.4. DISPOSAL OF CONTAMINATED MATERIALS

All contaminated materials generated during a spill event will be contained and disposed of as appropriate per the product specific MSDS/SDS and as outlined in the Hazardous Waste Management and Non-Hazardous Waste Management Plan. Empty drums, barrels, mega-bags and storage tanks are available to store contaminated materials for disposal.

Hydrocarbon contaminated soil, snow and water may be remediated in Landfarm facilities as per the Landfarm Management Plan if these materials meet the requirements for remediation in these facilities or placed within the underground mine.

2.5. SPILL RESPONSE RESOURCES

2.5.1. ON-SITE RESOURCES

Spill Response Kits will be available near (within 200 m) any areas where chemicals are stored and used on site, including near all bulk fuel berms and smaller fuel tanks. Spill response kits will be easily

accessible for personnel responding to a spill. As project activities evolve and new locations of chemical storage and use are identified new spill kits will be added as needed, and all active construction areas where equipment is operating will also have a spill kit located within 200 m.

Additional spill response equipment is maintained for response in an aquatic environment. This equipment is stored in seven moveable containers that can be relocated for rapid response to a spill in a stream, lake or marine environment.

A list of supplies contained in each spill kit type, and in the aquatic spill response containers, is provided in Appendix B.

All fuel transfer vehicles are also equipped with a spill kit designed to address smaller spills of hazardous fluids (<40 L). Personnel are trained in proper fueling procedures and spill trays are used during all fueling activities to minimize the potential of an unintentional release.

TMAC also maintains an on-site supply of roll, pad and mat absorbents, plug and dyke kits, mini booms, absorbent socks, peat moss, crushed corn cobs, coconut mats, hand tools, empty storage tanks and various pieces of heavy equipment including a vacuum truck, grader, dozers, excavators and haul trucks that would be used in the event of a large spill.

Spill kits are replenished as needed after use and inspected at least once per calendar year. The purpose of the inspection is to evaluate the location of spill kit proximity to associated work activities, inspect the condition of the spill kit, and check that all required contents are available and in good condition.

The aquatic response supplies and equipment are inspected annually prior to fuel offloading events and after use in the event of a spill to the aquatic environment.

2.5.2. OFF-SITE RESOURCES

The Hope Bay Project is a remote location that is only accessible by plane for the majority of the year, with a short open-water ship access season. The Hope Bay Project Spill Contingency Plan does not rely on off-site resources to successfully respond to anticipated upset conditions. The Plan has been developed such that the resources required to respond to spills have been positioned on site. It is anticipated that the Hope Bay Project will have sufficient resources and trained personnel to respond to all types/sizes of spills that could potentially occur on site.

Additional off-site resources are available to the Hope Bay Project from the Mackenzie Delta Spill Response Corporation, which focuses on the protection of the Arctic Marine environment. TMAC may secure additional equipment or assistance from the Mackenzie Delta Spill Response Corporation in the event of a significant spill to an aquatic environment.

3. SPILL INVESTIGATION, DOCUMENTATION AND REPORTING

3.1. SPILL INVESTIGATION

The Environmental Coordinator is responsible for investigating and documenting the cause of all spills that occur at the Hope Bay site. This investigation will be aimed at determining the root cause of a spill and identifying corrective actions that will reduce the risk of a repeated incident. The Site Safety Representative and Surface Manager may participate in the investigation and assist in developing corrective actions. Any corrective actions that are identified will be implemented immediately, entered into the Environmental Incident Register and communicated with all personnel at the Hope Bay site through email communications and/or discussions at departmental safety meetings.

3.2. TMAC INTERNAL REPORTING

An Incident Event notification will be sent by the Environmental Coordinator to environmental personnel and Supervisors working at the Hope Bay site within 24 hours of the spill event. This notification will provide a brief description of the spill, consequences of the spill, root cause of the event if identified and a brief description of the response including containment and cleanup actions.

If the spill produced is greater than 25% of what is outlined in the Reportable Spills Regulation the Environmental Coordinator will also complete an Environment and Compliance Incident Report that will be distributed to environmental personnel and Supervisors working at the Hope Bay site. This report will provide a detailed description of the incident, root causes, immediate response actions taken and any corrective/preventative actions that were identified during the course of the investigation.

All details of the spill investigation and implementation of corrective/preventative actions will be documented in the Environmental Incident Register by the Environmental Coordinator.

3.3. EXTERNAL REPORTING REQUIREMENTS

In the event that a particular material spill meets or exceeds the amount specified in the Immediately Reportable Spills Table (located at http://www.enr.gov.nt.ca/programs/hazardous-materials-spills/reporting-spills, and at the beginning of this plan), the Environmental Coordinator or representative will complete the NT-NU Spill Report form (available through the preceding link) and report the spill to the NT-NU 24 Hour Spill Report Line by phone (867-920-8130) and/or e-mail (spills@gov.nt.ca) as soon as possible within 24 hours of the event. The INAC Inspector and the KIA will be copied on these submissions. The submission of the report will not be delayed even if not all information is available at the time of submission.

In the event that a spill has occurred to the marine environment, the Surface Manager and/or Environmental Coordinator will also notify the Canadian Coast Guard station immediately and provide details on the time and location of the discharge, type and quantity of pollutant, description of assistance and salvage measures employed and any other relevant information. A written report will also be submitted within 24 hours to the Canadian Coast Guard. A copy of this report will be submitted to a Transport Canada Marine Safety Inspector if required.

The Environmental Coordinator will communicate with the VP Environmental Affairs and the Environmental Advisor during the incident to determine additional notifications to be submitted to regulatory agencies during the event.

Within 30 days of the event, the Environmental Coordinator will submit a detailed written spill report to the appropriate regulatory agencies. This report will include a description of the spill location, type and quantity of spilled material, associated causes that led to the incident, details of actions taken to remediate affected areas and potential effects of the spill, measures undertaken to reduce the potential for a reoccurrence of a similar incident, results of monitoring activities undertaken and details of any further actions required. Other applicable details such as the names of agencies on the scene, persons or agencies advised concerning the spill, a chronological sequence of events including internal/external notifications, and lessons learned from events leading up to the spill and the response actions taken may be included in this report. Additional follow-up engagement may occur as deemed appropriate by the VP Environment and based on the specific spill and stakeholder input.

A list of spills reported to the NT-NU Spill Report Line will also be provided in the annual report for each of the licence areas.

3.4. MONITORING AND RESTORATION

Monitoring activities may be conducted to assess the impacts of the spill and the effectiveness of associated cleanup/remediation efforts in the event spilled material cannot be removed. This may

include a number of monitoring techniques and collection of samples for laboratory analysis. The monitoring program will be developed by the Environmental Coordinator in consultation with the Environmental Affairs Department and associated regulatory agencies.

Monitoring may be triggered in the event of spills to water of substances that dissolve or sink or where substance recovery is unlikely. Samples will be collected to characterize 1) the material discharged (if not of known characteristics), 2) the water at the location of entry into the waterbody as soon after the discharge as possible, and 3) water at a 'reference' location, preferably within the same waterbody but outside of the area of potential impact and collected at approximately the same time as the sample collected at the point of entry.

Monitoring may also be triggered in the event of externally reportable spills to land for which recovery of spilled material is unlikely or may be incomplete. Samples will be collected from locations of suspected highest remaining contamination, or as a composite sample from the remediated area. Samples will be compared to soil remediation criteria and background soil concentration data to verify appropriate clean-up has occurred.

The Environmental Coordinator will be responsible for overseeing the implementation of these monitoring activities. No person will be permitted to sample spilled materials unless that person has received adequate training in the identification of the hazards associated with the spilled material, the selection and use of appropriate personal protective equipment, and safe sampling procedures.

The final required clean-up, restoration (or mitigation) and on-going monitoring will be conducted as needed, and where appropriate in consultation with, and satisfaction of, the INAC Inspector and the KIA. Site specific studies may be required to determine the appropriate final clean-up criteria.

If required, continuing and progressive sample collection/analysis will be conducted and reported upon until the completion of all prescribed remedial activities.

4. SPILL MANAGEMENT AND MITIGATION

Site supervisor and managers are responsible for ensuring work area inspections and risk assessments are conducted of their respective work areas. Risk assessments include evaluation of hazardous materials available and in use in the work area, and likelihood and potential consequences of various spills. Where appropriate based on likelihood and potential severity, mitigation, management and/or substance-specific spill response plans will be developed.

This plan presents below currently identified potential spill risks with potential for high severity and/or probability of occurrence (worst case scenarios) and the management and mitigation measures employed to reduce likelihood of occurrence and/or potential severity. Scenarios, as well as appropriate management and mitigation actions, will be added to through time as identified.

4.1. ISSUE: SPILL FROM A CHEMICAL STORAGE TANK OR OTHER CONTAINMENT

A fuel storage tank, containment area, sump, emergency dump catch basin or other fuel tanks may release their contents for a number of reasons, such as due to puncture, openings developed over time due to degradation (such as rusting), or overfilling.

Equipment malfunction or facility failure may cause a spill event to occur, particularly during extreme winter temperature conditions experienced at the Hope Bay site.

4.1.1. MANAGEMENT RESPONSE

This risk is minimized through the use of secondary containment and spill containment. All bulk fuel facilities are located in secondary containment (i.e. containment designed to contain volumes equivalent or greater than 110% of the aggregate or total volume of the largest container in the containment (whichever is greater)). Smaller chemical storage tanks are either double walled (have

built-in secondary containment), and are located in spill trays such that any leakage from hoses or lines are further contained or are located in secondary containment berms. Spill trays are used under fuel drums and other smaller chemical containers.

Inspections of all containment structures will be routinely conducted to ensure concerns are noted and are addressed promptly.

In the event that a spill exceeded the capacity of a containment berm (for example, if more than one container in a berm was breached) or a containment berm became compromised, the spill response actions outlined in Section 2 would be implemented. Containment measures would be deployed to prevent the spread of the chemical into the natural environment. This would include deploying absorbent materials or booms and constructing diversion trenches or sumps to intercept the spilled product. The vacuum truck and all available pumps would be deployed to transfer spilled product into empty storage tanks or alternative containment berms if necessary.

4.2. ISSUE: SPILL DURING TRANSPORT

Spills may occur during the transport of chemicals from one site location to another.

4.2.1. MANAGEMENT RESPONSE

As new chemicals, fuels and hazardous materials are brought to site, standard operating procedures are developed that outline the process for safely transporting or transferring these products between locations at site. Experienced operators transport these materials and are familiar with site road conditions. Traffic right-of-way procedures are established that reduce the risk of an accident between two vehicles and all vehicles are equipped with radio communication to ensure operators can remain in contact at all times. A spotter is used to direct operators loading and off-loading these materials from transport vehicles to reduce the risk of damage to chemical storage containers during transport and loading. Spill trays are used when chemicals are transferred to equipment or secondary containers for use.

4.3. ISSUE: SPILL DURING TRANSFER

Spills have an increased likelihood of occurring during transfer of chemicals. This may be the case during equipment refuelling, transfer of chemicals between containers, or transfer of wastewater in pipelines. Such spills may result from human error (overfilling, inaccurate filling) or equipment malfunction (such as a break in the transfer line/pipe due to wear or freeze/thaw cycles).

4.3.1. MANAGEMENT RESPONSE

As new chemicals, fuels and hazardous materials are brought to site, standard operating procedures are developed that outline the process for safely using these chemicals during operations. Workers who use chemicals or fuels during daily operational activities receive training in the proper handling, storage and disposal of these materials prior to commencement of work. Any applicable MSDS/SDS sheets are reviewed by all workers using these chemicals to identify potential hazards. Workers are encouraged to plan work activities before beginning a task to reduce the potential for inadvertent errors.

Fueling of mobile equipment generally takes place at the Doris Fueling station, which is located inside of the Doris Bulk Fuel Containment berm, minimizing risk to the environment. Remote fueling, such as occurs for stationary equipment and helicopters, requires a spill kit be easily accessible and spill trays are used.

Fuel tanks are not filled to full capacity, to reduce the possibility of overflow during fueling or due to expansion.

Workers are provided with on-site training in spill response techniques and are familiar with the response resources available in the event of a spill.

Wastewater transfer pipelines, for sewage as well as other wastewaters, are constructed to reduce breakage due to freeze/thaw cycles and are inspected as needed to ensure they are functioning. Additional design features of the tailings lines which reduce the risk of spills are outlined in the Doris North Tailings Operations, Management and Surveillance (OMS) Plan (*in prep*.).

Should any of the above measures fail, spill response would be undertaken as outlined in this document.

4.4. ISSUE: SPILLS FROM EQUIPMENT

Spills may occur from mobile and stationary equipment during routine maintenance or due to equipment malfunction or wear combined with extreme weather conditions.

4.4.1. MANAGEMENT RESPONSE

All equipment at site undergoes routine preventative maintenance, and mobile equipment is subject to daily pre-operational inspections to identify specific issues for mechanical resolution. Where possible, all equipment maintenance is performed in designated maintenance areas. During equipment maintenance, spill trays are used as needed. Spill trays are also used for stationary equipment, or those parked for extended periods of time.

4.5. ISSUE: HEALTH AND SAFETY OF SPILL RESPONDERS

Some products and chemicals used at the Hope Bay site may pose a risk to the health and safety of personnel responding to a spill. Spilled materials may create toxic, explosive or flammable hazards that must be considered during response efforts.

4.5.1. MANAGEMENT RESPONSE

Personnel working at the Hope Bay site are provided on-site training in the proper handling, storage and disposal of chemicals related to their tasks. The product MSDS/SDS is reviewed by personnel prior to using these chemicals to identify potential hazards related to handling these materials.

The MSDS/SDS for each chemical outlines the specific personal protective equipment (PPE) required when handling each product and provides information on methods for clean-up in the event of an accidental release to the environment. MSDS/SDS sheets are maintained at site for all chemicals stored and used at the Hope Bay Project.

In the event that a spill poses toxic, explosive, flammable or other hazards that endanger personnel or the environment, the Emergency Response Team (ERT) will be activated through the Incident Command System. Members of the ERT are equipped with additional PPE that allows them to safely respond to hazardous situations and receive additional training in response techniques for these scenarios.

Site chemicals are reviewed annually and compared to the Environmental Emergency Regulations. If any chemicals are anticipated to be stored in quantities exceeding the volume thresholds outlined in these regulations a Product Specific Spill Response Plan will be developed and submitted as an addendum to this Plan. Product Specific Spill Response Plans identified as necessary for construction and operations phases are located in Appendix A of this Plan.

4.6. ISSUE: SPILLS TO WATER

Spills to water are of particular concern due to the sensitivity of water environments and potential of rapid spread of spills into water.

4.6.1. MANAGEMENT RESPONSE

No chemicals are stored within 31 m of water. All chemicals are kept in containment, and spill kits are located nearby which contain small booms and absorbent pads. In the event of a large spill to water, additional itemized and audited Aquatic Spill Response Equipment is located at Roberts Bay in movable seacans. Response actions protective of wildlife are outlined in environmentally Sensitive Species section above.

4.7. ISSUE: OPERATIONAL CONSIDERATIONS FOR SPILL RESPONSE

Hope Bay is a remote project site that experiences extreme weather conditions and seasonal daylight variations which may impact the effectiveness of spill response actions. The Hope Bay Project is only accessible by plane for the majority of the year, with a short open-water ship access season.

4.7.1. MANAGEMENT RESPONSE

This Plan has been developed such that the resources required to respond to spills have been positioned on site. It is anticipated that the Hope Bay Project will have sufficient resources and trained personnel to respond to all types/sizes of spills that could potentially occur on site.

The majority of activities conducted at the site occur on the project infrastructure roads and camp pads. In the event that a spill occurs off the site infrastructure, helicopters and off-road tundra (low impact) vehicles, such as the Rim-pull, will be used to mobilize spill response resources. The impact from these vehicles will be monitored and damage to the surrounding tundra minimized to the extent possible.

Extreme weather conditions, such as sub-zero temperatures, that may impact the response capabilities of personnel will be mitigated by rotating personnel from response activities to break areas as needed. This may include using heated vehicles, portable shelters or heated buildings.

Portable light plants are available on-site and will be used in seasonal darkness to aid in spill response containment, clean-up and remedial actions.

5. TRAINING

All personnel working at the Hope Bay site receive onsite training during the initial site orientation. At that time, every employee is informed that he/she is potentially a First Responder to any spill or unanticipated discharge event and is provided a brief explanation of the actions expected of every First Responder and where to find the First Responder SOP (flow chart) which is included in the site spill kits. Spill response plans are also located in accessible public locations on site.

Supervisors provide task-specific training to workers using chemicals onsite which includes appropriate handling, storage, disposal, and where to find guidance on spill response for these chemicals. Workers are provided with information on spill response requirements and the locations of spill kits in their immediate work area.Spill response techniques are reviewed in departmental safety meetings by the Environmental Coordinator on a regular basis and lessons learned from spill investigations are communicated to all workers as corrective actions are developed.

Additionally, more detailed training is provided to workers involved in fuel offloading activities, through consultants such as Riverspill Response Canada Ltd. The instructional sessions include site safety, materials properties and strategies as well as tactics for containment and recovery in-facility, on land (brief) and on water spills. This training also includes the performance of mock spill response practical exercises in years of fuel offload, including deployment of spill response equipment under typical operating conditions.

Members of the Emergency Response Team receive frequent training regarding a variety of incident scenarios and response techniques applicable at the Hope Bay site. This training includes response to fire, explosive or toxic incidents, including spill of materials that could result in these conditions.

These training programs ensure that Hope Bay Project personnel understand the procedures in the *Hope Bay Project Spill Contingency Plan,* the hazards of the materials stored on-site, who is responsible for what activities, how to initiate a response, where to find and use response equipment, and how to obtain off-site resources.

6. REFERENCES

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SPILL CONTINGENCY PLAN

APPENDIX A – HAZARDOUS MATERIALS AND PRODUCT SPECIFIC SPILL RESPONSE PLANS

POISONOUS & TOXIC SUBSTANCES

Sodium Cyanide Specific Spill Response Plan

Note: Sodium cyanide is not currently listed in Schedule 1 of the E2 regulations. However, a Product Specific Spill Response Plan has been developed for this product based on the environmental and health and safety impacts of a potential spill. Hydrogen cyanide is produced when sodium cyanide reacts with water, acids or oxidizing agents. Hydrogen cyanide is listed in Schedule 1 of the E2 regulations.

Sodium Cyanide CAS No. 143-33-9

Potential Acute Health Effects: Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, and of inhalation. Corrosive to eyes and skin. Cyanide is classified as extremely toxic.

Storage: Sodium cyanide briquettes will be packaged in 1000kg bags. These bags must be kept dry, away from heat and sources of ignition. Keep away from oxidizing agents, acids and moisture. Bags will be stored on pallets in lined seacans or located in a lined containment berm or inside the Mill building as used. Do not store above 24°C. Avoid exposure to acid, water or weak alkalies which can react to form a toxic hydrogen cyanide (HCN) gas.

Personal Protective Equipment for Spill Response:

- Splash goggles
- Full body suit (e.g. Tyvek)
- Self-contained breathing apparatus or Vapor and dust respirator
- Boots
- Gloves

Emergency response for a Sodium Cyanide Spill:

- Isolate and evacuate the spill area if HCN has potentially been released.
  - Evacuation of other site locations may be required (large spills in water may require protection of personnel up to 5 km downwind)
- Report spill to Supervisor immediately. Provide location, estimated quantity, physical nature of the spilled material (e.g. solid or solution) and other substances/conditions that may create hazardous conditions during response (e.g. exposure of substance to water, acids, oxidizing agents).
- Supervisor will report the spill immediately to the Surface Manager.
- Surface Manager will activate Incident Command System and Emergency Response Team if required for response.
  - Based on size, location of spill and potential hazardous conditions/environmental impacts.
  - MSDS/SDS will be consulted to confirm appropriate response measures and associated hazards.
- Ventilate the area of the spill or leak and eliminate all ignition sources.

  - Air quality monitoring will be conducted in confined spaces to determine concentration of hazardous vapours prior to initiating spill response efforts.
- Stop the flow of spill.
- Contain the spill by placing spill booms or constructing interception dikes ahead of the flow (prioritizing prevention of release to waterways or onto ice).
- Protect the spill area from water runoff by constructing dike/berm. If raining, use tarps to cover the area to minimize water contact and spread of contamination.
- For spill to land:
  - Recover spilled solid material by shoveling into drums or containers free from impurities, seal container with lid and clearly label per WHMIS guidelines.
  - Minimize dust generated to the extent possible. Use water spray to reduce vapours; avoid contact of water spray with spilled material. Use tarps to cover spill area if water spray is used to reduce vapours.
  - Recovered solids, if free from impurities, may be suitable for its intended use. In this case, material is to be placed into containers with lid, and clearly labeled as per WHMIS guidelines.
  - Recovered material which cannot be used will be packaged into drums for offsite disposal at an approved waste management facility.
  - Neutralize residual spill material with appropriate agent as recommended by the MSDS/SDS (sodium or calcium hypochlorite solution) or continue to excavate area until no visible spilled solid remains. Use suitable spill absorbent or soil to absorb the neutralized residue.
- For spill to water:
  - NaCN dissolves in water producing highly toxic hydrogen cyanide gas – use extreme caution.
  - Pump contaminated water to drums, tanks or lined containment berms if possible. Isolate/confine the spill by damming or diversion if feasible.
  - Water treatment is only effective if it can be accomplished in conjunction with the spill.
  - Treatment chemicals (sodium or calcium hypochlorite) must not be added to surface waters (e.g. streams, lakes) as these are not generally effective and could result in additional environmental impacts.
  - Hydrogen peroxide for treatment of solution spills or a sulfur dioxide/air process for treatment of slurry spills may be considered. This measure may only be used as a last resort if containment is not achievable and the spill can be treated directly at the point of release.
- For indoor spills:
  - Recover spilled solid material by shoveling into drums or containers free from impurities, seal container with lid and clearly label per WHMIS guidelines.
  - Minimize dust generated to the extent possible. Use water spray to reduce vapours; avoid contact of water spray with spilled material. Use tarps to cover spill area if water spray is used to reduce vapours.
  - Recovered solids, if free from impurities, may be suitable for its intended use. In this case, material is to be placed into containers with lid, and clearly labeled as per WHMIS guidelines.

  - Recovered material which cannot be used will be packaged into drums for offsite disposal at an approved waste management facility.
  - Neutralize residual spill material with appropriate agent as recommended by the MSDS/SDS (sodium or calcium hypochlorite solution) or continue to excavate area until no visible spilled solid remains. Use suitable spill absorbent or soil to absorb the neutralized residue and package into drums for offsite disposal at an approved waste management facility.
  - Mop the affected area using detergent and water.
  - Place this water in labeled waste drums for offsite disposal at an approved waste management facility
- Remove, bag and label personal protective equipment for offsite disposal.
- Thoroughly wash skin with soap.

EXPLOSIVE MATERIALS

Ammonium Nitrate Specific Spill Response Plan

Notes: Ammonium Nitrate is a substance listed on Schedule 1 of the E2 Regulations, with a threshold of 20 tonnes. Ammonium nitrate is part of the Amex explosives (UN No 0082) mixture used at site.

CAS No. 6484-52-2 (Ammonium Nitrate)

UN No: 0082 (Amex)

Potential Acute Health Effects: Highly Explosive. Hazardous in case of contact with skin, eyes, ingested and if inhaled. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation.

Usage: Amex is used for surface blasting associated with quarrying and subsurface blasting related to mine development and mining.

Storage: Ammonium Nitrate is found in mixture form on site, in the form of Amex. Amex is stored in locked seacans located within the explosives berms or storage magazines, as well as temporary use locations during blasting preparation both underground and in the quarry sites. The magazines and explosives berm locations are established and permitted through NRCan or the Ministry of Mines as appropriate.

The explosives storage areas are constructed and located so as to minimize risk to personnel and as permitted by the Ministry of Mines. The expected quantity expected on site is 900 tonnes of Amex. The maximum allowed capacity of the largest container in which the substance is stored is 40,800 kgs.

Spill Response

Personal Protective Equipment for Spill Response:

- Chemically resistant gloves
- Protective glasses or chemical safety goggles
- Chemically resistant coveralls or tyvek coveralls
- Dust mask if spill is in confined space

Emergency response for an Ammonium Nitrate Spill:

- Isolate and evacuate the spill area if potential for explosion
- Report spill to Supervisor immediately. Provide location and estimate of spill quantity.
- Supervisor will report the spill immediately to the Surface Manager.
- Surface Manager will activate Incident Command System and Emergency Response Team if required for response.
    - Based on size, location of spill and potential hazardous conditions/environmental impacts.
- Remove all sources of heat and ignition (there is to be no smoking or use of any flames within the area). Remove all uncontaminated combustible materials or organic compounds from spill area.
- Stop flow if safe to do so.

    - Ventilate space prior to entering, if indoors.
- For spills to land, snow or ice:
    - Protect spill area from storm water runoff and prevent entry into surface waters by constructing a ditch or dike using suitable absorbent materials, soil or other appropriate barriers.
    - Vacuum or sweep the spilled residue using non-metal, non-sparking tools.
    - Avoid shock, friction and contact with grit. Wet spillage with water to prevent dust generation.
    - Place the residue in a plastic container, label as per WHMIS Guidelines and transport to waste management for offsite disposal.
    - Recovered solids, if free from impurities, may be suitable for its intended use. In this case, material is to be placed into suitable containers with lid, and clearly labelled as per WHMIS Guidelines.
- For spills to water:
    - Ammonium nitrate sinks and mixes with water.
    - Isolate/confine the spill from spreading by damming or diversion if feasible.
    - Pump contaminated water to drums, tanks or lined containment berms if possible.
    - Label drums for offsite disposal at an approved waste management facility.
- Remove, bag and label personal protective equipment for offsite disposal.
- Thoroughly wash skin with soap.

ADDITIONAL E2 REGULATIONS SCHEDULE 2 MATERIALS TO BE STORED ONSITE

The hazardous materials to be stored onsite and listed in the Environmental Emergency Regulations may include the following substances throughout the duration of the project:

Formalin
Unleaded Gasoline
Hydrochloric acid
Jet-A fuel (contains naphtha)
Nitric acid

The quantities of these products are not anticipated to meet the thresholds under the Environmental Emergency Regulations for the development of a product specific spill response plan. However, if at any time the quantities of these materials stored onsite reach the threshold volume identified in these regulations a product specific spill plan will be developed and submitted as an addendum to this Plan.

SPILL CONTINGENCY PLAN

APPENDIX B – SPILL RESPONSE RESOURCES

MOBILE EQUIPMENT

Any mobile equipment present on site may be used as a resource for spill response or spill clean-up. This includes pick-ups, skid steers, excavators, loaders, vacuum trucks, haul trucks, and flatbed trucks.

SPILL KIT CONTENTS

Each Spill Kit contains:

- 1 roll absorbent or bundle of spill pads
- 2 plug and dyke kits;
- 1 – 3 m x 4 m tarpaulin;
- 2 pairs of disposable coveralls;
- 4 mini booms;
- 1 bag of corncob and/or peat moss absorbent;
- 1 bag of gravel type fire retardant granular for aviation stations (helipad and airstrip);
- 2 pair of neoprene gloves [i.e. POL (petroleum/oil/lubricants) resistant];
- 2 sets of splash proof POL resistant goggles;
- 1 shovel;
- 10 disposable waste bags and ties; and
- A copy of the Spill Kit First Responder Insert

AQUATIC ENVIRONMENT RESPONSE EQUIPMENT

Response equipment available in the event of a spill to the aquatic environment is stored in seven moveable seacans, with the exception of the boats. This equipment includes:

- 450 feet of 24" solid floatation boom;
- 70 lb, 43 lb, 25 lb, and 17 lb Danforth anchors;
- 8 lb Grapnel Anchors;
- 36” sea anchors;
- Anchor pins;
- Anchor Buoys;
- Anchor lines;
- 150 feet Towline;
- Boom towing bridles;
- 1250 feet of skirted booms (preassembled with tow lines, bridles and floats);
- 200 feet of inflatable Shore Saver booms (with inflation kit);
- 1TDS-118 Drum Skimmer;
- 1 P10E Power Pack;
- 2 Pump;
- 175 L Drum Response Kits c/w lids;
- Disposable coveralls (i.e.Tyvek suits);
- POL (petroleum/oil/lubricants) resistant gloves;
- POL resistant goggles;
- Toolbox c/w assorted tools;
- 45 Gallon containers c/w lids;
- Pails and Rubbermaid tubs;
- 300 foot Nylon rope (3/8);
- Bags of Oclansorb™ Peat Moss or crushed corn cobs;
- Bundles of oil sorbent pads;
- Bundles of universal sorbent pads;

- Oil Sorbent booms;
- Universal sorbent booms;
- Bag of Sorbent scraps (spaghetti);
- Containment tanks and berms;
- Plug and dyke kits;
- HAZMAT Disposal Bags and Garbage bags;
- Portable fuel bladders
- Ice scrapers;
- A net for capturing seabirds/oiled wildlife
- An 18 foot landing craft boat (with boat safety kit); and
- An 18 foot Zodiac (with boat safety kit and repair kit)

The above aquatic response equipment is considered more than necessary for the potential spills covered under this Plan. Spills to the aquatic environment are limited in potential scale as all fuel storage tanks are located in secondary containment and most are located away from water. The Roberts Bay multiple tank fuel farm berm also has significant excess capacity to contain failure of more than one tank.

As a consequence, spills that may reach water are expected to be limited in size, manageable and recoverable using the aquatic response equipment available on site. If for any reason additional resources are needed, they are available through Mackenzie Delta Spill Response.

Large spills to the marine environment resulting from bulk fuel offloads are addressed through the OPPP/OPEP. As outlined therein, shipping contractors provide all necessary equipment needed to appropriately respond to a fuel-offload spill, with TMAC supplies serving as additional resources available.

SPILL CONTINGENCY PLAN

APPENDIX C – ENVIRONMENTAL RESOURCE MAPS

ENVIRONMENTAL RESOURCE MAPS

Shown in the following resource maps are areas of particular vegetation meaningful to the local wildlife and ecosystems which surround the project as well as raptor nests, rare plants and fish habitat. Additional detailed information may be found in baseline and monitoring reports available from the Site Environmental Coordinator and publically available on the Nunavut Impact Review Board and Nunavut Water Board websites. Information regarding archeological sites that have been identified on the Hope Bay belt are available to the Environmental Coordinator in the event of a spill. At the requirement of the Territorial Archaeologist, the locations of these sites are strictly confidential and information on these locations is only shared on an as needed basis. Spill containment will attempt to minimize impacts to sensitive habitat's and archaeological sites.

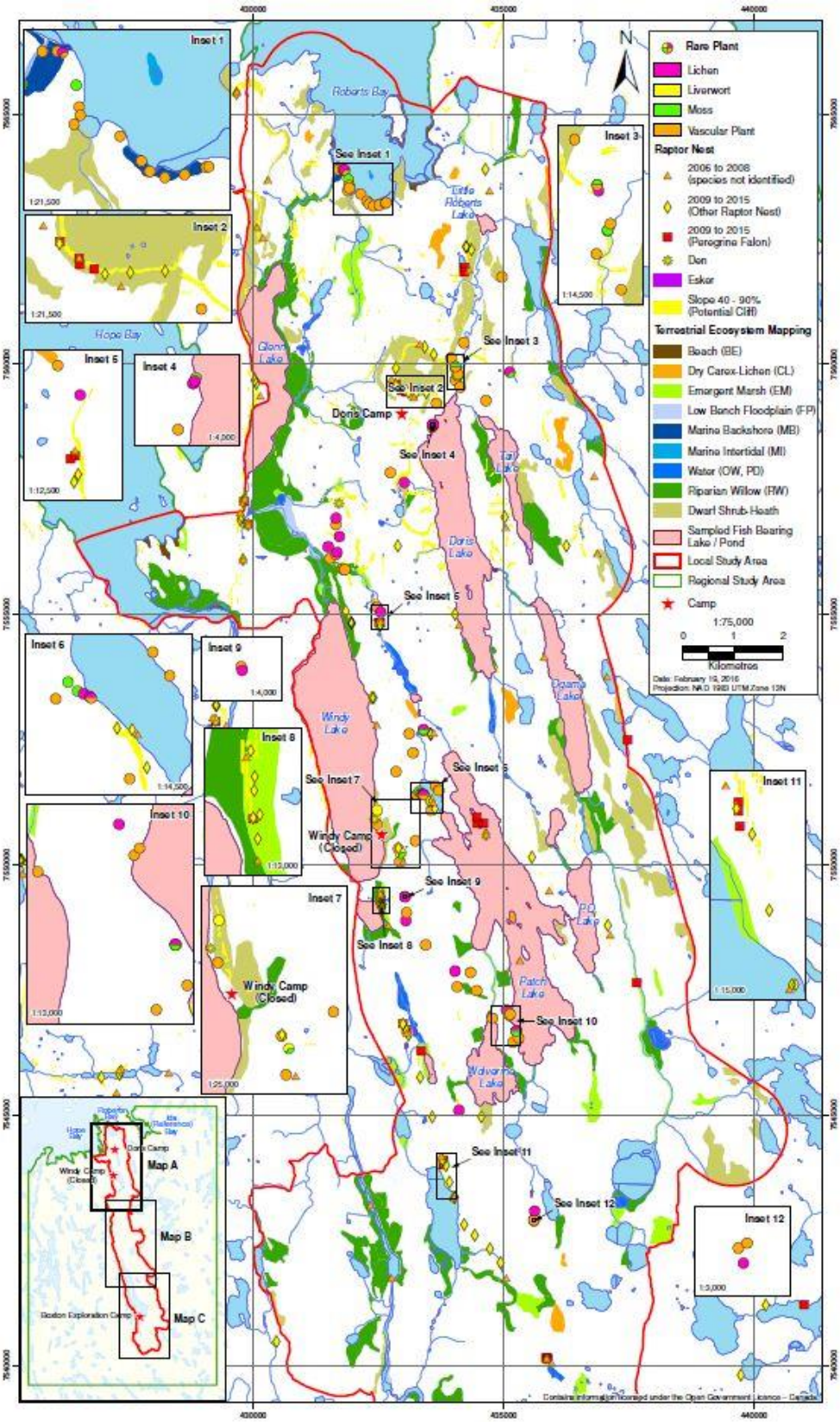

Figure C-1: Environmental Sensitivity Mapping-Map A

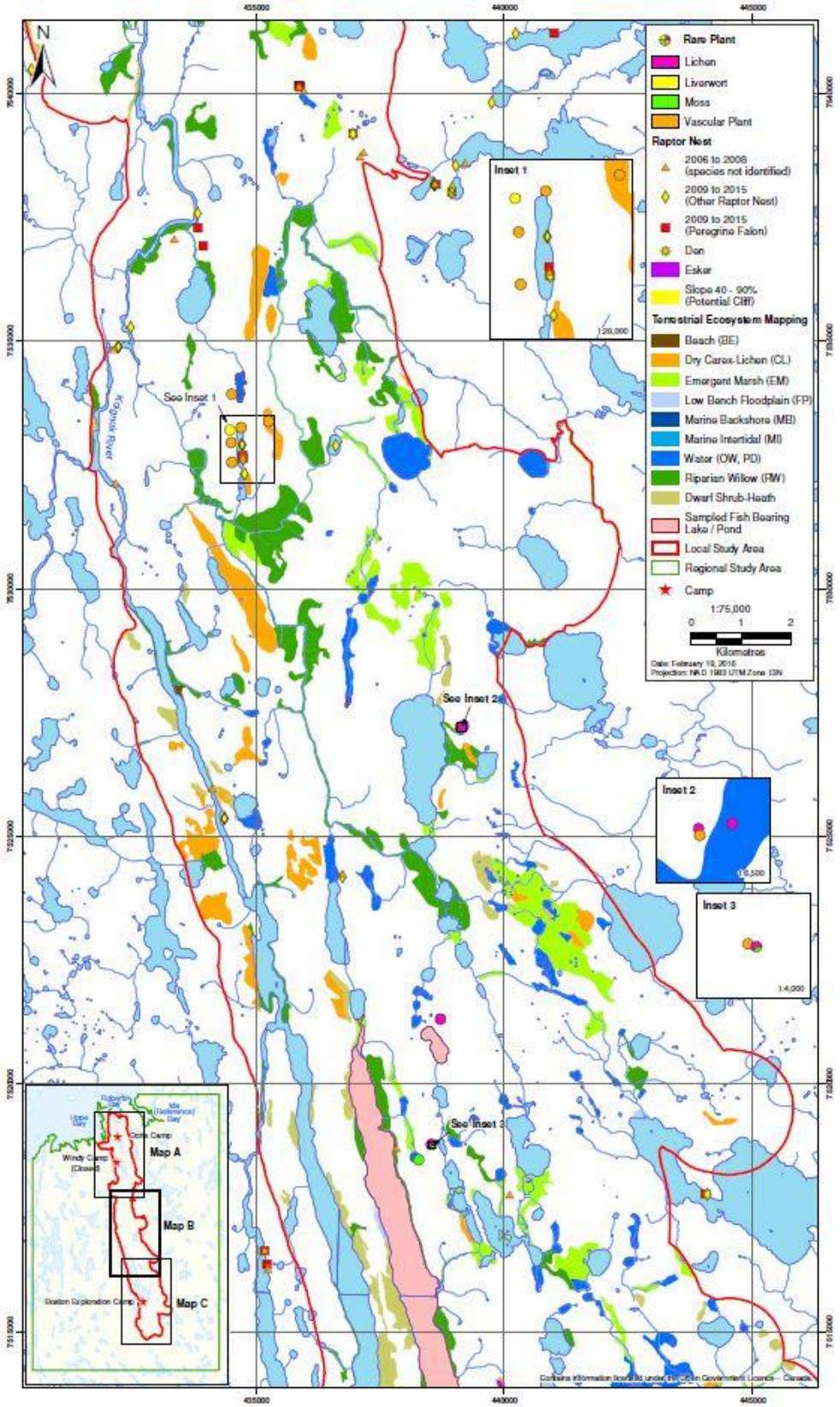

Figure C-2: Environmental Sensitivity Mapping-Map B

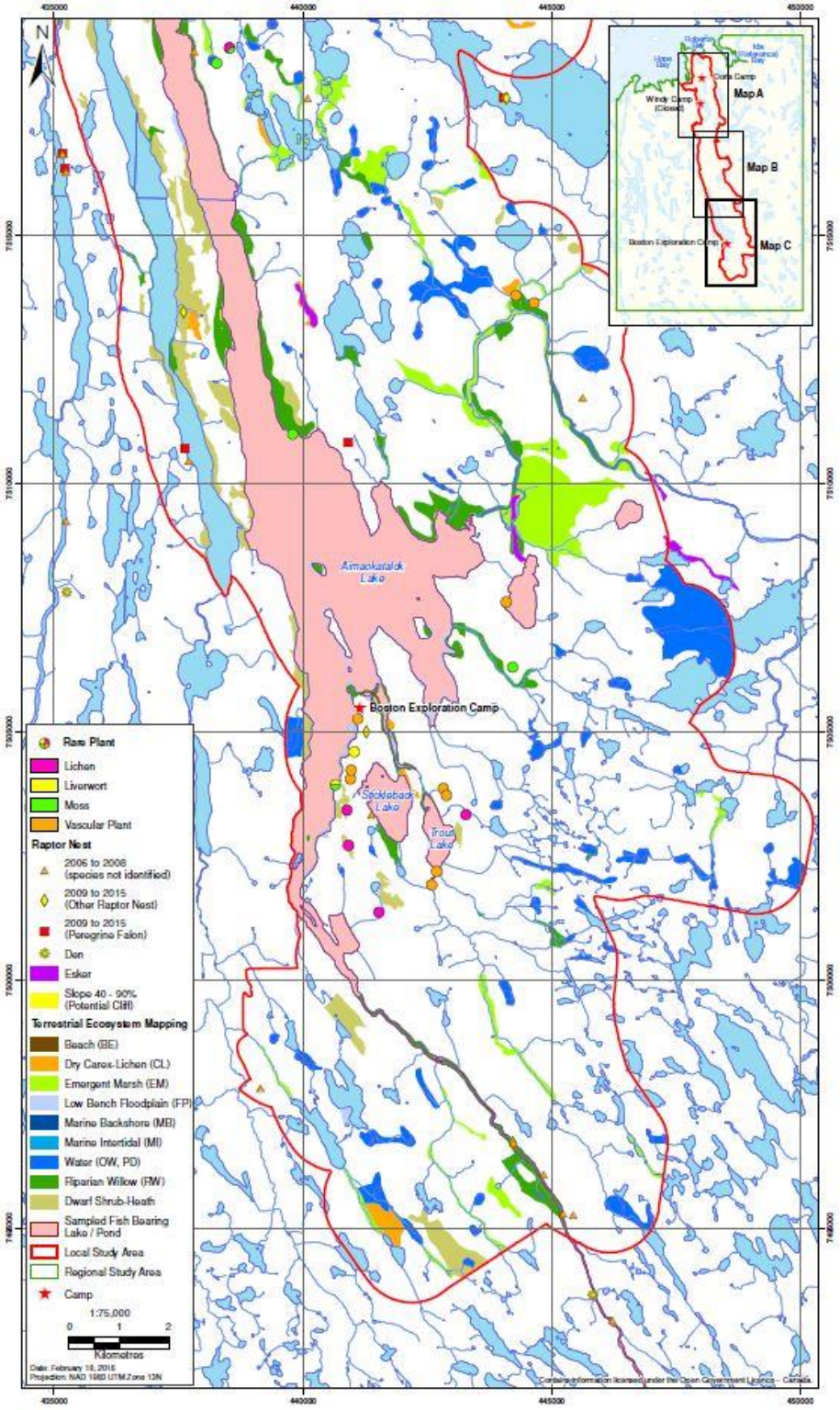

Figure C-3: Environmental Sensitivity Mapping-Map C

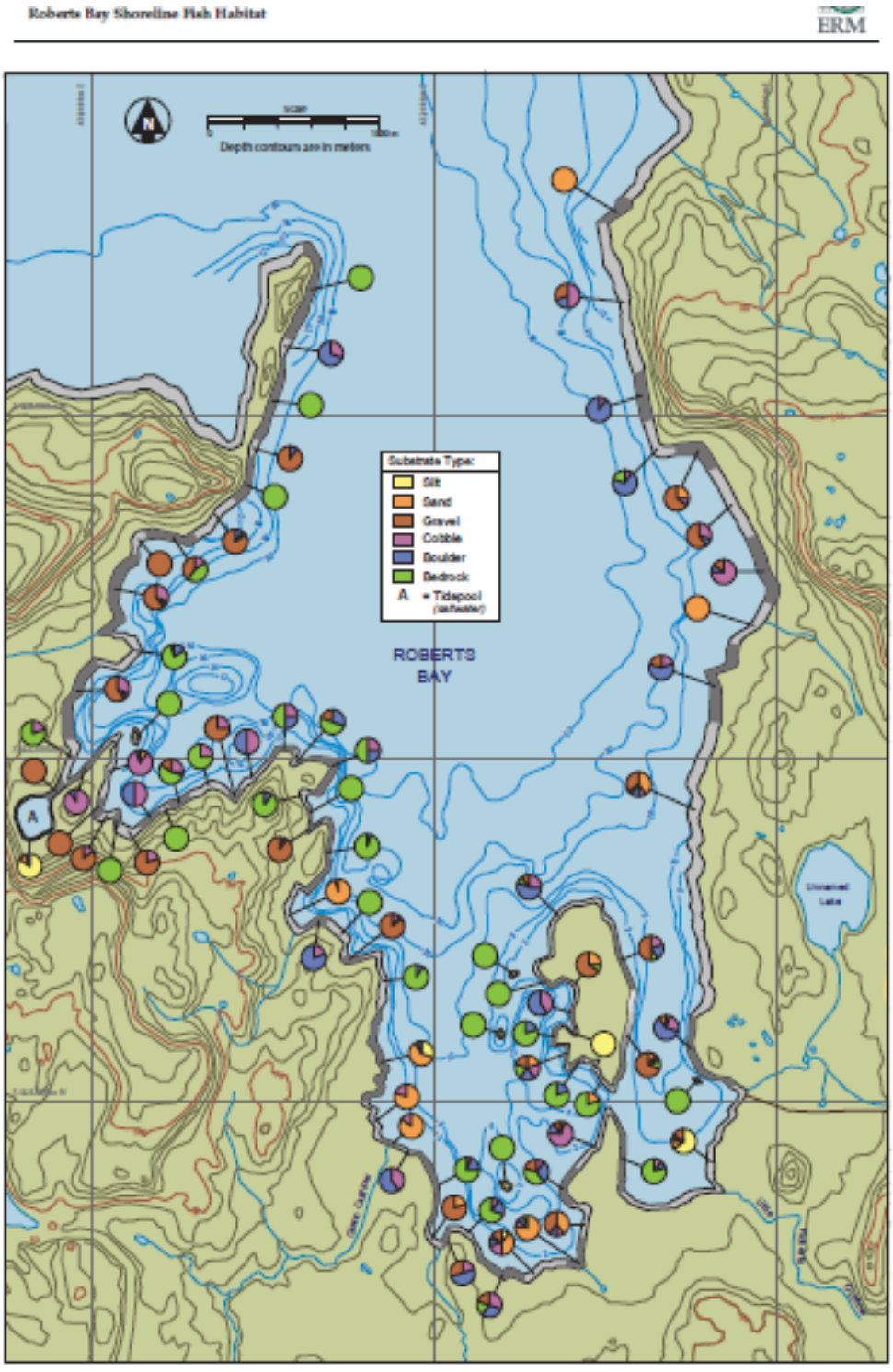

Figure C-4: Environmental Sensitivity Mapping-Map D

APPENDIX D – RESPONSES TO COMMENTS ON PREVIOUS PLAN VERSIONS

COMMENT RESPONSES AND REVISION REFERENCES

This Plan replaces the 2016 Spill Contingency Plan for the Hope Bay Project. The table below outlines the comments received on the previous version of this Plan and TMAC's responses.

Comments received on the previous version of this Plan and TMAC's responses

Reviewer	Comment #	Comment	Recommendation	Response
INAC	1	Appendix A of the Spill Contingency Plan provides details on spill kit contents and aquatic environment response equipment, but the information on mobile equipment (machinery) to be used for spill response is not available.	INAC recommends that the licensee include the list of mobile equipment to be used for spill management, as well as the spill containment equipment on each piece of equipment.	Any mobile equipment present on site may be used as a resource for spill response or spill clean-up. This includes pick-ups, skid steers, excavators, loaders, vacuum trucks, haul trucks, and flatbed trucks. This has been made clear in revised text in Appendix A.
INAC	2	Section 2.5.1 of the spill contingency plan states that spill response kits will be available within 200 m of any areas where chemicals are stored and used. Aquatic spill response kits are available in moveable containers. The spill response kit locations are described as being easily accessible, but it is not clear if there will be adequate signage to identify them. As well, the modules at the end of the plan include pictures on which chemical storage locations are circled, but there is no indication where to find the spill kits beside them. The Guidelines for Spill Contingency Planning recommend including a plan with many features including storage locations of hazardous materials and locations of spill response kits.	INAC recommends that spill kit locations be identified on the ground and, on a site map or indicated in the pictures included in the plan. Default storage locations for the mobile aquatic response spill kits should be included so that a person consulting the plan would quickly know where to look for them.	Default spill kit locations, including the mobile aquatic response spill kits, have been now indicated on the site photographs provided in the site-specific modules.
INAC	3	The section on spill response actions (2.3) outlines actions to be taken in event of different spill scenarios. Two of the scenarios for spills in water outline actions to be taken in event of a hydrocarbon spill, but do not speak to what should be done if other materials are spilled. These are sub-sections 2.3.5, spills under ice, and mitigation of impacts to birds. Some of the materials listed as on site including sodium cyanide would not disperse in the same way as petroleum products and would require different action responses.	INAC recommends that the licensee include action responses for materials that might sink or dissolve in water for spills under ice and mitigation of impacts to birds.	Information addressing spill sunder ice of substances that sink and dissolve is now presented in Section 2.3.6 and 2.3.7 Respectively. Mitigation of impacts to birds is addressed under 2.3.10.1
INAC	4	Table 1 of section 1.2 includes regulations and guidelines governing the spill contingency plan. Other regulations are referenced in the text and included in section 7 of the plan.	INAC suggests that other material to be considered might include: · Federal Transportation of Dangerous Goods Act and regulations; and · NWT Used Oil and Waste Fuel Management Regulations	Waste material generated during spill response is managed as per the Hazardous Waste Management, Non-Hazardous Waste Management Plan, and/or the Landfarm Management Plan as indicated in Section 2.4 of the Plan. TMAC's Hazardous Waste Management Plan includes consideration of/reference to the Federal Transportation of Dangerous Goods Act and regulations and NWT Used Oil and Waste Fuel Management Regulations, as well as many other materials which may apply to management and disposal of spill response wastes, such as GN's Environmental Guideline for Used Oil and Waste Fuel.
ECCC	1	Reference: Page 18 of the revised Spill Contingency Plan, EC #2: Comment: As noted in the table ECCC requested that TMAC undertake and	It is expected that the risk assessment process will incorporate consideration of the likelihood of various spills and their potential consequences, which will determine	TMAC has provided further clarification of the risk assessment process to be undertaken for all

Reviewer	Comment #	Comment	Recommendation	Response
		incorporate hazardous substance identification and risk assessment into the Spill Contingency Plan in order to provide the required basis for accident scenario characterization and response planning.	appropriate mitigation/response strategies according to the resulting matrix rankings.	work areas in the revised Plan, in Section 4.
ECCC	2	Reference: Pages 1819 of the revised Spill Contingency Plan, EC #4 Comment: ECCC reiterates recommendation EC #4 which requests that TMAC document and provide information on worst case accident scenarios for each hazardous product stored and handled onsite.	While the TMAC has indicated that the appropriate sections of the SCP "will continue to be refined in future revisions to capture additional scenarios as operational activities evolve and corrective actions/lessons learned are developed through incident investigations" ECCC is of the opinion that by identifying worst case accident scenarios now, TMAC will be better placed to determine actual required response capacities and develop adequate preparedness and response plans.	During the 2016 revision of the Plan, and based on ECCC's recommendation # 4 cited in the 2016 Plan, TMAC identified worse case scenarios and appropriate responses and included this information in the 2016 SCP as Section 4 "Spill Response Management Issues and Contingencies". TMAC's text indicating that worst case scenarios and responses 'will continue to be refined in future' was an acknowledgement of the continual improvement process loop employed at the Hope Bay Project including the risk assessment process, and recognition that additional scenarios may be identified and added to this Plan in future as a result.
KIA	1 (KIA-6)	The Spill Contingency Plan provides a solid outline of reporting and mitigation measures in the event of a spill. Although specific mitigation of impacts to wildlife, including birds, and sensitive habitats is outlined, there is no specific detail associated with a spill into fish habitat. It is noted that no chemicals are stored with 31m of water, but there are no specific response actions protective of fish, as is outlined for other wildlife in the 'environmentally Sensitive Species' section. Environmental Resource Maps are provided in Appendix C, but the focus is on vegetation and terrestrial features.	TMAC should include additional maps and detail be provided for freshwater and marine fish habitat, so that sensitive features can be avoided, and if a spill were to occur near or in water, that the sensitivity of the habitat would be easily found and appropriate mitigation measures taken.	Fish are addressed and protected under the Plan by the management actions addressing spills to water. Fish habitat (sites which have been sampled for fish and within which fish have been found) are also indicated on the Environmental Resource Maps presented in Appendix C. TMAC has also included a fish habitat map of Roberts Bay in the revised Plan to allow identification of sensitive intertidal and shallow subtidal habitat for avoidance where possible.
KIA	2 (KIA-7)	The Spill Contingency Plan states in section 1.4, "In the event that a spill requires activation of the Emergency Response Plan, the Environmental Coordinator will provide guidance to the Surface Manager regarding implementing response actions according to this plan and evaluating priorities for protection of sensitive habitats/species and archeological features at risk." A decision tree for use by the Surface Manager/Incident Commander or Environmental Coordinator has not been provided for the reviewer to evaluate how sensitive habitats/species and archeological features are prioritized in the event of potential impact to multiple priority areas.	TMAC should include a decision tree outlining how various sensitive or high value locations are prioritized. This will ensure of these locations are prioritized in the event of a spill or unplanned discharge in a manner satisfactory to KIA.	A prioritization hierarchy has been proposed for the environmental sensitivities and is now included in Section 2.3.10
KIA	3 (KIA-8)	In Section 2.3.8, the Plan states, "TMAC and previous companies operating on the Hope Bay site have conducted numerous ecological surveys to identify [environmentally sensitive habitats or archeological sites] at risk, with the focus of identifying those areas immediately surrounding Project infrastructure which are at greatest risk of impact from a spill. In the event that a spill enters the natural environment, the Environmental Coordinator will use maps identifying these sensitive areas to prioritize the protection of these resources." In the event of an unplanned spill or discharge, these sites will only become a mitigation	TMAC should ensure that the Environmental Coordinator has a-priori knowledge of high priority environmentally sensitive habitats and archeological sites and how to respond in these areas and provide all first responders with instruction on the locations of high priority environmentally sensitive habitats and archeological sites so that First Responders are immediately aware of them in the event of a spill or unplanned discharge. This would allow these locations to be prioritized and/or avoided when applying mitigation measures.	TMAC wishes to clarify that environmentally sensitive habitat maps are included in the Plan, which is available to all staff including the Environmental Coordinator. These maps identify locations of sensitive habitat, raptor nests, den sites, and fish habitat. Only archaeological site locations are kept confidential, at the requirement of the GN's Territorial Archaeologist. However, the Environmental Coordinator has ready access to archaeological site

Reviewer	Comment #	Comment	Recommendation	Response
		priority after the Environmental Coordinator has had a chance to review the pertinent maps and provide guidance to the response team. A delay in First Responders becoming aware of these priority locations may limit the effectiveness of mitigation measures, permit more significant adverse impacts than necessary, or even damage those locations through the application of mitigation measures. We understand that, Environmental Resource Maps outlining archeological sites are kept confidential by TMAC. However, the need to keep the locations of these sites confidential must be weighed against the risk of potential spills and unplanned discharges.		maps. of all locations which may be designated high priority.
KIA	4 (KIA-9)	In Section 3.4 the Plan states, "Monitoring activities may be conducted to assess the impacts of the spill and the effectiveness of associated cleanup/remediation efforts in the event a spill cannot be completely removed." The KIA notes that spills reaching watercourses or waterbodies will eventually disperse as a result of natural hydrology such that they are "completely removed" from the environment even if impacts have occurred. The language included in the Plan does not require monitoring in the event of a spill or unplanned discharge to water nor other habitat types. The KIA's right to compensation for damages to their lands and waters makes prompt and effective monitoring important to both TMAC and the KIA in the event of a spill or unplanned discharge.	TMAC should include triggers which require monitoring activities, and provide details of the type of monitoring that will be undertaken as part of adaptive management to spills and unplanned discharges in the Plan. This discussion should be specific to the type of spill, volume, mobility of the spilled material and proximity to various habitat features. Triggered monitoring should be implemented as quickly as possible such that it would characterize the impact of a spill to the receiving environment as well as the effectiveness of mitigation.	TMAC has provided more detail on spill related monitoring in Section 3.4.
KIA	5 (KIA-10)	TMAC specifies in Module B that the Windy Camp is "no longer occupied". TMAC further specifies that "Fuel storage at Windy Camp is limited to one tank (double-walled Tidy Tank) containing a maximum of 1240L of diesel fuel." This tank is located more than 31 m from any waterbody and has been placed in "a secondary portable berm capable of containing the full volume of this tank in the event that the double-walled system failed". However, no schedule for regular inspections of the tank or secondary containment has been included. A breach in the double-walled Tidy Tank may persist within the secondary containment for an unknown period of time placing the receiving environment and wildlife at potential risk.	TMAC should include the frequency fuel storage structures will be inspected at the Windy Camp, and increase the capacity of the secondary portable berm to 110% the total volume of the 1240L Tidy Tank.	TMAC has clarified in the revised Plan that the tank at Windy is a double-walled enviro tank (i.e. it possesses 110% secondary containment in its design and construction), and is also located inside of tertiary containment, with a capacity > 110 % of the volume of the tank. Although this tank is located at Windy camp, it is there to support Doris activities (it is the fuel supply tank for the potable water pump used to collect all potable water for Doris Camp), as such it is inspected on a regular basis as required under the Doris Water Licence (Part I Item 2 and 4).

Spill Contingency Plan

MODULE A: DORIS

CONFORMITY TABLE

Licence	Part	Item	Topic	Report Section
2AM-DOH1323	I	1.	The Board has approved the Plan entitled "Spill Contingency Plan, Hope Bay, Nunavut" dated April, 2016. The Licensee shall within sixty (60) days of issuance of this Licence, submit a revised Plan to the Board for review that takes into consideration the recommendations received during the technical review of the Plan. Any change in the status of the Project and operations will require a review and resubmission as per PART B, Item 9.	This Plan
		2.	The Licensee shall prevent any chemicals, petroleum products or wastes associated with the project from entering Water. All sumps and fuel caches shall be located at a distance of at least thirty one (31) metres from the ordinary High Water Mark of any adjacent Water body and inspected on a regular basis.	Section 2
		3.	The Licensee shall provide secondary containment for fuel and chemical storage as required by applicable standards and acceptable industry practice.	Section 4.1
		4.	The Licensee shall perform regular inspections of Fuel Storage and Containment Facilities, Sumps, Emergency Dump Catch Basins, other fuel tanks and connectors for leaks and movement and shall keep a written log of inspections to be made available to an Inspector upon request. More frequent inspections may be required at the request of an Inspector.	Section 4.1
		5.	If, during the period of this Licence an unauthorized discharge of Waste and or Effluent occurs, or if such discharge is foreseeable, the Licensee shall:	See below
		5a.	Employ the Emergency Response and Spill Contingency Plan;	Section 2
		5b.	Report the incident immediately via the 24-Hour Spill Reporting Line (867) 920-8130, to the Inspector at (867) 975-4295 and to the Kitikmeot Inuit Association at (867) 982-3310; and	Section 3.3
		5c.	For each spill occurrence, submit a detailed report to the Inspector, no later than thirty (30) days after initially reporting the event, which includes the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.	Section 3.3
		6.	The Licensee shall, in addition to Part I, Item 5, regardless of the quantity of releases of harmful substances, report to the NWT/NU Spill Line if the release is near or into a Water body.	Section 3.3

		7.	The Licensee shall submit to the Board for review, at least sixty (60) days prior to operation of the Roberts Bay Discharge System, an addendum to the Spill Contingency Plan detailing spill prevention measures along the pipeline.	To be provided 60 days prior to operation of Roberts Bay Discharge System
		8.	The Licensee shall, upon providing notification under PART L, Item 2, submit to the Board, an addendum to the Spill Contingency Plan, detailing the changes in operations, personnel, responsibilities, availability of equipment and access to the site for assistance.	Section 1.4
	Schedule B		The Annual Report referred to in Part B, Item 3 shall include the following:	See below
		8.	A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.	Section 3.3

A1. INTRODUCTION

The Type A Water Licence No. 2AM-DOH1323 issued to TMAC by the Nunavut Water Board (NWB) requires the development of a Spill Contingency Plan in accordance with Part I. The Spill Contingency Plan has been prepared and is being submitted by TMAC to address this requirement, and also includes the plan for spill response throughout the Hope Bay belt.

The 2AM-DOH1323 Licence area includes the Doris North Camp and the necessary infrastructure to support surface exploration, underground mining and development activities.

A2. CHEMICAL STORAGE AT DORIS

A list of fuel and chemical storage facilities, containment capacity, products stored and maximum expected quantity to be stored within each facility for the Doris North Licence area is provided in the table below. Chemical storage locations are also depicted on the photographs provided below, in addition to the default spill kit locations.

DORIS FUEL AND CHEMICAL STORAGE LOCATIONS

Storage Location	Facility Description/ Storage Capacity	Tank Description	Containment Capacity	Products Stored	Maximum Expected Quantity Stored
Robert's Bay Bulk Fuel Storage Facility (Quarry 1 / ST-6a)	1 @ 5,000,000 L Tank– empty/piping decommissioned Dispensing Module (Inactive)	Field-erected	Gravel/HDPE, 3,200,000 L	Waste Oil in Lined Seacans Drummed Jet-A Fuel 1000L Engine Oil Totes	0L in Tank. Berm used to house oil totes and fuel barrels - cumulative quantities of < 500,000 L.
Robert's Bay Bulk Fuel Storage Facility (ST-6b)	3 @ 5,000,000 L 1@ 400,000 L Tanks	Field-erected	Gravel/HDPE, 9,190,000 L	Diesel Fuel Jet-A	15,000,000 L 400,000 L
Batch Plant/ equipment storage	2 @ 1240 L	Pre-fabricated, double-walled, portable	Spill containment	Diesel Fuel	2 @1116 L
Doris Camp Plant Site Fuel Storage Facility (ST-5)	5 @ 1,500,000 L Tanks Dispensing Module (Active)	Field-erected	Gravel/HDPE, 2,976,000 L	Diesel Fuel	7,500,000 L
Doris Helipad (office, washcar)	1 @ 1240 L	Pre-fabricated, double-walled, portable	Insta-berm, spill containment	Diesel Fuel	1116 L
Doris Helipad (Jet-A Storage)	Drums in Seacan (maximum 64 drums)	Drums	HDPE spill containment	Jet A Fuel	13,120 L
Doris Helipad (landing pads)	Drum fuel (8) placed at each active helicopter landing pad	Drums	Plastic spill pallets, 220 L	Jet A Fuel	1640 L
Doris Muster Station	1 @ 1240 L	Pre-fabricated, double-walled, portable	HDPE/Wood spill containment	Diesel Fuel	1116 L

Storage Location	Facility Description/ Storage Capacity	Tank Description	Containment Capacity	Products Stored	Maximum Expected Quantity Stored
Doris Powerhouse (old)	1 @ 15,000 L	Pre-fabricated, double-walled, portable	HDPE/Wood spill containment	Diesel Fuel	15,000 L
Doris Powerhouse (new)	3 @ 5000 L	Pre-fabricated, double-walled, portable	3 @ 5500 L each, Concrete	Diesel Fuel	15,000 L
Roberts Bay Waste Management Facility Generator	Internal tank 2250 L	Pre-fabricated, double-walled,	Internal steel spill containment	Diesel Fuel	2025 L
Roberts Bay Incinerator	1 @ 1500 L (Inactive) 2 @ 1000 L	Pre-fabricated, double-walled Pre-fabricated, double-walled	Steel Spill containment	Diesel Fuel Diesel Fuel	1350 L 2 @ 1000 L
Waste Management Facility Waste Oil Burner	2 @ 850 L	Plastic Cube	Spill containment	Waste Oil	1700 L
Rob Bay Muster Station	1 @ 1240 L	Pre-fabricated, double-walled, portable	Steel Spill containment	Diesel Fuel	1116 L
Doris Vent Raise	1 @ 70,000 L	Pre-fabricated, double-walled, portable	Gravel/HDPE, 77,000 L	Diesel Fuel	70,000 L
Doris Airport Tower Generator	1 @ 1240 L	Pre-fabricated, double-walled, portable	Steel spill containment; in seacan	Diesel Fuel	1116 L
Doris Airport Tower (aircraft fuel)	Drum fuel (8) by airport tower	Drums	Plastic spill pallets, 220 L each	Jet A or B Fuel	1640 L
Doris Pump House	1 @ 1240 L	Pre-fabricated, double-walled, portable	HDPE/Wood spill containment	Diesel Fuel	1116 L
Geotech Shop	1 @ 1240 L	Pre-fabricated, double-walled, portable	Steel spill containment	Diesel Fuel	1116 L
Main Shop	2 @ 1240 L	Pre-fabricated, double-walled, portable	Steel spill containment	Diesel Fuel	2 @ 1116 L
Explosive Berm (Tail Lake Road)	Seacan	NA	NA	Amex (Ammonium nitrate)	900,000kg
Mill Building	1 @ 1240 L	Pre-fabricated, double-walled, portable	Steel spill containment	Diesel Fuel	1116 L
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Collector*	90,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Promoter*	30, 100kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Frother*	16,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Flocculant Low pH*	16, 000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Sodium Cyanide*	240,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Caustic Soda*	450,000 kg

Storage Location	Facility Description/ Storage Capacity	Tank Description	Containment Capacity	Products Stored	Maximum Expected Quantity Stored
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Flocculant High pH*	2,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Sodium Metabisulphate*	240,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Copper Sulphate*	125,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Hydrochloric Acid*	4000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Sodium Benzoate*	20,000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Silica Sand*	5000 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Borax*	12,500 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Soda Ash*	8750 kg
Reagent Storage Berm	Seacan	NA	Gravel/HDPE	Potassium Nitrate*	5000 kg
Lower Laydown	Seacan	NA	NA	Acetylene	10 - WTL bottles (~3600 cu.ft. of product)
Lower Laydown	Seacan	NA	NA	Propane	30 – 100 lb bottles (3000 lbs)
Lower Laydown	Seacan ERT building ERT building	NA	NA	Oxygen	10 - K bottles (6900L ea) 3 - M bottles (3000L ea) 4 – D bottles (350L ea) (~79,400 L. of product)
Rob Bay Laydown	Seacans with 23 kg bags	NA	NA	Calcium Chloride	11,030 tonnes (~44,800 bags)
Wastewater Treatment Plant	Jugs	NA	NA	PH Enhancer	40 L
Wastewater Treatment Plant	Jugs	NA	NA	12% hypochlorite	240 L
Wastewater Treatment Plant	Jugs	NA	NA	Suppressor 2360	220 L
Wastewater Treatment Plant	Boxes	NA	NA	Polymer	174 kg
Wastewater Treatment Plant	Jug	NA	NA	PH Enhancer 7007	4.5 L
Wastewater Treatment Plant	Jug	NA	NA	PH Enhancer 7004	4.5 L
Wastewater Treatment Plant	Jug	NA	NA	Citric Acid	10 L
Wastewater Treatment Plant	Pail	NA	NA	Caustic Powder	10 L
Wastewater Treatment Plant	Boxes	NA	NA	Hydrated Lime	4.5 kg
ERT building – Fire Caddy	Drum	NA	NA	Flame Out Foam	205 L

**Anticipated quantities and locations when mine and milling operational capacity is reached. The quantities listed for each of these products are operational peak esimates and expected location stored, they may vary.*

ROBERTS BAY LAYDOWN

Note: Red Circles are fuel or chemical storage locations, smaller containment locations may vary. Yellow stars (or a yellow circle in the case of the aquatic mobile response spill equipment) indicate default spill kit locations.

DORIS CAMP

Note: Red Circles are fuel or chemical storage locations, smaller containment locations may vary. Yellow stars indicate default spill kit locations.

DORIS HELI PAD (TOP) AND DORIS LAKE FRESHWATER PUMPHOUSE (BOTTOM)

Note: Red Circles are fuel or chemical storage locations, smaller containment locations may vary. Yellow stars indicate default spill kit locations.

REAGENT BERM AND EXPLOSIVE BERM

Note: Red Circles are fuel or chemical storage locations, smaller containment locations may vary. Yellow stars indicate default spill kit locations.

SPILL CONTINGENCY PLAN

MODULE B: WINDY

CONFORMITY TABLE

Licence	Part	Item	Topic	Report Section
2BE-HOP1222	B	2.	The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported which shall contain the following information:	Section 3.3
		2.e	An update to the Spill Contingency Plan, if required, including contact information in the form of an addendum;	This report
	H	1.	The Licensee has submitted, September 23, 2011, a Spill Contingency Plan entitled Hope Bay Project Spill Contingency Plan, for the Hope Bay Project, which encompasses the Hope Bay Belt projects including Roberts Bay, the Doris, Boston and Windy camps. This Plan covers the Windy Camp with respect to care and maintenance of the site. The Licensee shall submit to the Board for approval in writing, within ninety (90) days of issuance of this Licence, a revised Plan that takes into consideration the status of the entire Hope Bay Belt project as it influences the activities, environmental and safety issues of the Windy Camp and the Hope Bay Regional Exploration Project.	This report
		2.	Licensee shall submit to the Board for approval in writing, sixty (60) days prior to the resumption of exploration activity at the Hope Bay Regional Exploration Project, a revised Spill Contingency Plan that is specific to the scope of this Licence and prepared in accordance with the *Spill Contingency Planning and Reporting Regulations* developed under Section 34 of the *Environmental Protection Act*.	Plan filed in March 2014, updated here. Section 2 and Section B2
		3.	The Licensee shall, if not approved by the Board, revise the Plan referred to in Part H, Item 1, and resubmit to the Board for approval within thirty (30) days of receiving notification of the Board's decision.	Section 1.5
		4.	The Licensee shall implement the Plan specified in Part H, Item 1 as and when approved by the Board.	Section 1.5
		5.	The Licensee shall review the Plan referred to in this Part as required by changes in operation and/or technology and modify the Plan accordingly. Revisions to the Plan are to be submitted in the form of an Addendum, to be included with the Annual Report unless directed otherwise by an Inspector.	Section 1.4
		6.	The Licensee shall ensure that any chemicals, petroleum products or wastes associated with the project do not enter water. All sumps and fuel caches shall be located at a distance of at least thirty one (31) meters from the ordinary high water mark of any adjacent water body and inspected on a regular basis.	Section 4.7 and B2
		7.	The Licensee shall ensure that any equipment maintenance and servicing be conducted only in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other waste and contain potential spills.	Section 4.4
		8.	If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:	See below
		8a.	Employ the Spill Contingency Plan;	Section 2
		8b.	Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and	Section 3.3
		8c.	For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will	Section 3.3

			include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.	

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B1. INTRODUCTION

The Type B Water Licence No. 2BE-HOP1222 issued to TMAC by the Nunavut Water Board (NWB) requires the development of a Spill Contingency Plan in accordance with Part H. The Spill Contingency Plan has been prepared and is being submitted by TMAC to address this requirement, and also includes the plan for spill response throughout the Hope Bay belt.

B2. CHEMICAL STORAGE AT WINDY

Windy Camp is located 10km south of Doris Camp at N 68° 03.715' W 106° 37.109' and is in the process of being decommissioned. Fuel storage at Windy Camp is limited to one tank (double-walled Tidy Tank) containing a maximum of 1240L of diesel fuel. This tank is located more than 31 m from any waterbody and fuels a generator used to heat a pump house structure located at the potable freshwater intake south of Windy Camp. Water is used to supply Doris Camp with potable water, and regular inspection of this facility occurs as per the requirements of the Doris Water Licence.

As the camp is no longer occupied, this tank has been placed in a secondary portable berm capable of containing 110% of the full volume of this tank in the event that the double-walled system failed. In case of a potential spill involving the Tidy Tank, there is a spill kit located at the pump house (at the shoreline).

No other hydrocarbons or chemicals are stored at Windy Camp. Any hydrocarbons or chemicals needed for decommissioning the camp structures will be brought to Windy Camp and consumed on an as-needed basis. Spill kits will be available within 200 m of working equipment during these activities.

The Bulk Fuel Storage Facility at Patch Lake was fully dismantled in 2012 and the area is in the process of being reclaimed. There are no hydrocarbons or chemicals stored at the Patch Lake Facility. Fuel or lubes required to complete reclamation work will be brought in for immediate equipment use, and a spill kit will be available on site to support operating machinery. Chemical storage locations at Windy Camp and the Bulk Fuel Storage Facility at Patch Lake are shown in photos below.

In case of exploration drilling on land and on ice, chemicals will be brought in to assist with the drilling process. Each drill will have its own fully stocked spill barrel and chemicals stored will be kept to an amount needed for each shift. Excess chemicals will not be stored within Windy Camp.

One permitted facility for explosives materials is located at Quarry A on the west side of the Doris-Windy all-weather road. This facility can store a maximum of 40,800 kg of explosive materials containing ammonium nitrate. In the event of a spill of this material, the spill response actions would be completed as outlined in the Produce Specific Spill Response plan in Appendix A of this document.

WINDY FUEL AND CHEMICAL STORAGE LOCATIONS

WINDY CAMP

Note: Red circle is fuel storage location, smaller storages locations may vary. Yellow star indicates spill kit location.

PATCH LAYDOWN FACILITY

Note: There are currently no chemicals stored on the Patch Laydown

SPILL CONTINGENCY PLAN

MODULE C: BOSTON

CONFORMITY TABLE

Licence	Part	Item	Topic	Report Section
2BB-BOS1217	B	6.	The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported which shall contain the following information:	Section 3.3
		6l.	updates or revisions to the Abandonment and Restoration Plan, QA/QC, Waste Rock and Ore Storage Plan, Spill Contingency Plan, and Landfarm Plan;	This Plan
	H	1.	The Licensee shall submit to the Board for approval, within sixty (60) days of issuance of the Licence, an update to the Spill Contingency Plan, submitted April 12, 2012, to address the current status of the Boston Advanced Exploration Project and all activity being suspended, moving into a state of care and maintenance for the Hope Bay Project. This Plan is to be prepared in accordance with the Spill Contingency Planning and Reporting Regulations developed under Section 34 of the Environmental Protection Act.	Plan submitted in March 2014, and revised in 2016 and here.
		2.	Licensee shall submit to the Board for approval in writing, sixty (60) days prior to the resumption of exploration activity at the Hope Bay Regional Exploration Project, a revised Spill Contingency Plan that is specific to the scope of this Licence and prepared in accordance with the *Spill Contingency Planning and Reporting Regulations* developed under Section 34 of the *Environmental Protection Act*.	This Plan
		3.	The Licensee shall, if not approved by the Board, revise the Plan referred to in Part H, Item 1, and resubmit to the Board for approval within thirty (30) days of receiving notification of the Board's decision.	Section 1.5
		4.	The Licensee shall ensure that any chemicals, petroleum products or wastes associated with the project do not enter water. All sumps and fuel caches shall be located at a distance of at least thirty one (31) meters from the ordinary high water mark of any adjacent water body and inspected on a regular basis.	Section 4.1
		5.	The Licensee shall ensure that any equipment maintenance and servicing be conducted only in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other waste and contain potential spills.	Section 4.4
		6.	If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:	
		6a.	Employ the Spill Contingency Plan;	Section 2

		6b.	Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and	Section 3.3
		6c.	For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.	Section 3.3

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C1. INTRODUCTION

The Type B Water Licence No. 2BB-BOS1217 issued to TMAC by the Nunavut Water Board (NWB) requires the development of a Spill Contingency Plan in accordance with Part H. The Spill Contingency Plan has been prepared and is being submitted by TMAC to address this requirement, and also includes the plan for spill response throughout the Hope Bay belt.

The 2BB-BOS1217 Licence Area includes the Boston Camp site which is currently in a Care and Maintenance phase but will soon be reopened for exploration activity.

C2. CHEMICAL STORAGE AT BOSTON

Photos of chemical storage locations and a list of fuel and chemical storage facilities, containment capacity, products stored and maximum expected quantity to be stored within the facility for the Boston Licence area is provided below. All storage facilities are located at a distance greater than 31 m from any water body.

C3. ADDITIONAL SPILL CONTINGENCY MANAGEMENT AT BOSTON

C3.1 ISSUE: BULK FUEL TANK FARM

Eight fuel tanks are located in a lined fuel berm covered with crush material at the Boston Site. The berm was constructed on permafrost and the crush pad is thin in some areas which may lead to permafrost degradation beneath the berm over time. Foundation settlement of the tanks due to permafrost degradation could potentially occur over time and could cause the fuel tank to destabilize creating risk of one or more of the fuel tanks to destabilize and tip.

C3.1.1 MANAGEMENT RESPONSE

Fuel tanks are visually monitored for differential settlement during seasonal visits when the Boston site is accessible and during annual geotechnical inspections. Measurements of tank movement may also be collected if visual monitoring indicates a potential issue with one or more of the tanks. This may involve measuring the vertical angle of the fuel tank sidewall. A comparison of these values over time will indicate if differential settlement is occurring.

BOSTON FUEL AND CHEMICAL STORAGE LOCATIONS

Location*	Facility Description/ Storage Capacity	Tank Description	Containment Capacity	Products Stored	Expected Quantity Stored
Boston Camp Bulk Fuel Storage Facility (BOS-5)	6 @ 77,000L Tanks 2 @ 33,500L Tanks	Pre-fabricated	Gravel/HDPE, 84,700 L	Diesel Fuel	377,127 L
Boston Fuelling Stations (tidy tank beside bulk storage)	1 @ 1374 L	Pre-fabricated, double-walled, portable	Gravel/HDPE spill containment	Diesel Fuel	1236 L
Boston Fuelling Stations (fly tank beside bulk storage)	1 @ 785 L	Pre-fabricated, double-walled, portable	Gravel/HDPE spill containment	Gasoline	628 L
Boston Helipad	Drum storage (8 drums)	Drums	Plastic spill pallets, 220 L each	Jet A Fuel	1640 L (empty when Project closed)

Location*	Facility Description/ Storage Capacity	Tank Description	Containment Capacity	Products Stored	Expected Quantity Stored
Boston Jet A fuel storage	Drum storage (seacan)	Drums	Lined seacan	Jet A	8200 L/seacan
Boston Generator Daytanks	2 @ 1240 L	Pre-fabricated, double-walled, portable	Gravel/HDPE spill containment (2)	Diesel Fuel	2232 L
Boston Fuelling Station (North, by camp facilities)	1 @ 1374 L	Pre-fabricated, double-walled, portable	Gravel/HDPE spill containment	Diesel Fuel	1236 L
Boston Tent Heaters Daytank	1 @ 1374 L	Pre-fabricated, double-walled, portable	Gravel/HDPE spill containment	Diesel Fuel	1236 L
Boston Daytank (inside)	1 @ 350 L	Pre-fabricated, Single walled	Steel floor and kickplate	Diesel Fuel	315 L
Boston Camp Daytank (NE side of camp between main camp and tents	1 @ 1374 L	Pre-fabricated, double-walled, portable	Gravel/HDPE spill containment	Diesel Fuel	1236 L
Boston Incinerator	1 @ 400 L	Pre-fabricated, double-walled	Steel spill containment	Diesel Fuel	360 L

**Additional portable storage facilities may be used depending on Project activity.*

BOSTON CAMP

Note: Red circles are fuel or chemical storage locations, smaller storage locations may vary. Yellow star indicates spill kit locations.