MHBL STANDARD ENVIRONMENTAL OPERATING PROCEDURE

REGIONAL EXPLORATION PROJECT

EMERGENCY RESPONSE AND CONTINGENCY PLANS

Anchored Fuel Barge, Roberts Bay October, 2006

In compliance with Nunavut Water Board
Water Use Permit # 2BE-HOP0207

Miramar Hope Bay Limited
Suit 300-889 Harbourside Drive
North Vancouver, BC V7P 3S1

December 07 2006

TABLE OF CONTENTS

Section Page

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

DOCUMENT CONTROL RECORD

Approved By:

Position	Name	Signature	Date
Vice President, Operations	Jim Currie		
General Manager, Northern Operations	Scott Stringer		
Vice President, Exploration	John Wakeford		
Exploration Manager	Darren Lindsay		

The re-issues of this document, listed below, have been reviewed and approved by Quality Assurance and Management and are authorized for use within the Miramar Hope Bay Ltd organization.

DOCUMENT CONTROL REVISION HISTORY					
Rev No	Page No	Details of Issue	Authorization		
			Name	Initial	Date
0	All	Original Document	Hugh Wilson		Feb 2002
0	All	Conditional Approval	NWB*		Mar 2004
1	All	Review	Hugh Wilson		Mar 2004
2	All	Review to include NWB specific concerns	Matthew Kawei	Hmk	May 2004
3	All	Review to include marine environment plans	Matthew Kawei	Hmk	Dec 2006

**Conditional Approval subject to revisions to the original document to include specific concerns raised by Nunavut Water Board*

DISTRIBUTION LIST

Date	Copy #	Name	Department/Location	Type
Original copy	0	MHBL – Library	Vancouver Server	Electronic, PDF & doc
	1	Darren Lindsay	MHBL, Vancouver	Electronic, PDF
	2	Scott Stringer	Yellowknife	Electronic, PDF
	3	Larry Connell	MHBL, Vancouver	Electronic, PDF
	4	Dave Power	Yellowknife	Electronic, PDF
	5	Terri Maloof	MHBL, Vancouver	Electronic, PDF
	6	John Wakeford	Vancouver	Electronic, PDF
	7	Jim Currie	Vancouver	Electronic, PDF
	8	Resource Project Manager	Windy Camp	Folder # 1
	9	Geology Office	Windy Camp	Folder # 2
	10	Site Supervisor	Windy Camp	Folder # 3
	11	Site Supervisor Office	Windy Camp	Folder # 4
	12	Major Drilling Foreman	Major Site Office	Folder # 5
	13	Site Superintendent	Windy Camp	Folder # 6

This is a Controlled Document As the registered recipient of this manual, you are responsible for keeping it up to date through the filing of all revisions and for returning the manual, should you transfer job, location, or leave the company.

Definitions

Adverse Effects – Impairment of or damage to the environment, human health or safety or property.

Emergency – Any unplanned occurrence either resulting in, or having the likely potential to result in environmental or human health impact or posing a threat to on-site personnel or the public, or interruption in company operations.

Emergency Log – A detailed written account of times, events and actions taken during an emergency.

Emergency Response Procedures – An outline of specific tasks required to implement the counter measures called for in the Emergency Response Plan. These tasks are often part of existing operating procedures for the facility.

Five (5) Point Safety System - 5 simple, practical steps to follow in assessing workplace hazards. See Safety manual in Appendix G.

Emergency Response Coordinator – The site supervisor or designated individual assigned to coordinate the deployment personnel for the purpose of spill clean up.

Emergency Response Team – A predetermined group of individuals whose purpose is to provide on-site expertise and labor to assist the on scene commander in bringing the emergency to an early, successful conclusion. This team will also response to wildlife incidents that represent risk to human or disrupts company activities.

Hazard Area – Any area where hazardous conditions exist, either during or as the result of an emergency. All non-essential personnel should be excluded from this area.

Levels of an Emergency – A subjective measure of the overall severity of the emergency.

Risk Assessment – Characterization of the nature, magnitude and likelihood of adverse effects on human health or ecosystems from exposure to one or more contaminating substances through various routes of exposure.

Spill Contingency Plan – A plan providing guidance on the counter measures needed to minimize or eliminate the consequences of specific hazards affecting the environment, facilities or operations. It also identifies the resources and their locations that are needed to implement the counter measures**.**

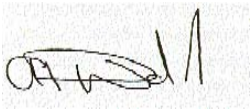
MIRAMAR HOPE BAY LIMITED

ENVIRONMENTAL POLICY

Miramar Hope Bay Limited (MHBL) is committed to maintaining sound environmental practices in all of its activities. To achieve this, MHBL is working with its employees and contractors will:

- Examine the potential impact to the environment of all proposed activities and take steps to minimize or where possible eliminate the impact.
- Ensure that all activities are in compliance with all environmental legislation and regulations.
- On a continuous basis, determine the MHBL impact to the environment and through continuous improvement, strive to attain higher levels of environmental performance.
- Maintain a high level of environmental protection by applying practices and technologies that minimize impacts and enhance environmental quality.
- Maintain dialogue with communities and other stakeholders within the area of influence of the Hope Bay Project.
- Progressively rehabilitate disturbed areas, develop closure plans that can be continuously improved and incorporate new technologies where practical.
- Encourage cooperative research programs with government and other stakeholders to better understand and monitor impacts associated with the Hope Bay Project.
- Train all employee and contractors to understand their environmental responsibility related to MHBL.

On behalf of Miramar Hope Bay Ltd.



Anthony Walsh
President and CEO
October 2006

MIRAMAR HOPE BAY LIMITED

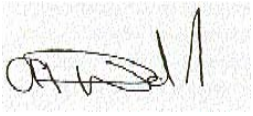
SAFETY POLICY

Miramar Hope Bay Ltd. is committed to providing a safe and healthy work place by developing, maintaining and promoting safe and productive work practices in all aspects of its business.

To achieve this, MHBL will:

- Include safety and occupational health considerations as an integral part of its operations, from design to closure.
- Take all reasonable and practical measures to ensure the work place is free of potentially hazardous conditions.
- Provide information, training, procedures and protective equipment to enable employees to work productively in a safe environment.
- Ensure that all employees understand and follow established safe work practices and procedures.
- Ensure that all contractors employed by MHBL abide by this policy.
- Maintain trained individuals or teams capable of dealing with medical and emergency situations.
- Improve occupational health and safety through continuous review and improvement of procedures.
- Ensure that all incidents are thoroughly investigated to eliminate or reduce any future occurrences.

On behalf of Miramar Hope Bay Ltd.



Anthony Walsh
President and CEO
October 2006

1 INTRODUCTION

The Emergency Response and Contingency Plans were revised to include recent comments received from Department of Fisheries and Oceans to include a portion covering Roberts Bay waterfront spill plan. The document was further developed to establish a guidance document for emergency responses at the Windy Exploration Project Camp and regional worksites (see Figure 1).

The document includes appendices to assist and inform all personnel on site so that they can respond to any site emergency that has the potential to adversely affect the natural environment and/or the safety of personnel.

The plan is driven by Miramar Hope Bay Limited (MHBL) environmental and safety policies and in compliance with regulatory requirements.

The Plan provides:

1 A clear chain of command for all emergency activities;

2 Accountability for the performance of the emergency response;

3 Well-defined task and operational hazards/risk; and

4 Reporting and record keeping requirements to track program progress.

The plan will be a "living" document and will be updated on a regular basis as new information comes to light or procedures, permits and authorizations change.

2 ADMINISTRATION

The responsibility for the administration of the plan will rest with the Vice Presidents of Exploration and Operation. The senior environment coordinator will support the Exploration Manager and General Manager, Northern Operations, and shall, in conjunction with Senior Safety Coordinator, Project Resource Managers, and Site Supervisors, review the plan on a regular basis and update as needed. The Occupational Health and Safety Committees will also review the plan periodically.

2.1 Purpose

The purpose of this document is to act as a general resource for each member of Management and all employees to enable them to react to emergencies at any Exploration Camps and Regional Worksites. The plan will act as a guidance tool to ensure immediate and effective handling of any emergency. Prompt, effective and organized Emergency Response by the company will ensure safety of the employees, minimize the impacts on the environment and maintain effective communication with the regulatory agencies.

Figure 1: Windy Camp Infrastructure Layout Map

Key: Numerical numbers indicating the general lay out for facilities at Windy Lake. Due to limited space, few location numbers will appear more than once.

1. 3 x Core storage area
2. Accommodation
3. Kitchen, Recreational, Office Complex
4. Enviro Emergency Response Equipment Storage
5. Freshwater Intake
6. Sauna
7. RBC Sewer System
8. Incinerator
9. Core logging/splitting shacks
10. Erection Tent (Muster Point)
11. Generator
12. Propane Storage Area
13. Jetty
14. Lined dyke
15. Land Treatment Area (LTA)
16. 2 x Helipad
17. Jet B Storage Area
18. 3 x AST fuel tanks & Gas drums
19. Contaminated fuel storage area
20. Gas drums (temporarily storage)
21. Emergency winter tent
22. Non-combustible solid waste storage
23. Unusable timbers/ply wood
24. Snow machines
25. Calcium Chloride (Salt)

2.2 Prevention

MHBL is committed to a prevention strategy of ongoing maintenance, inventory control, staff training and vigilance of all aspects of the work. The following will be standard practice on the Hope Bay Belt Exploration Camps and worksites:

Inventory control: All hazardous materials will be subject to strict inventory control from the time they enter the site. Logs will be kept as required for inspection by the regulatory agencies.

Storage: All hazardous goods will be stored in a manner that is required for the individual product as set out in the manufactures' material Safety Data Sheets (MSDS) (See Appendix B for list of Chemicals and Petroleum Products on site).

Daily inventory Balance: All liquid products will be checked on a daily basis and a balance sheet of inflow and outflow maintained.

Disposal: All hazardous materials will disposed in strict compliance with the laws and regulations of Nunavut. If such laws and regulation do not exit, use similar regulations for other provinces within Canada (for specific products etc).

Staff Reminders: Pre-Job meetings/safety meetings will contain a component to constantly remind employees to be on the look out for innovative ways to improve environmental and safety performances.

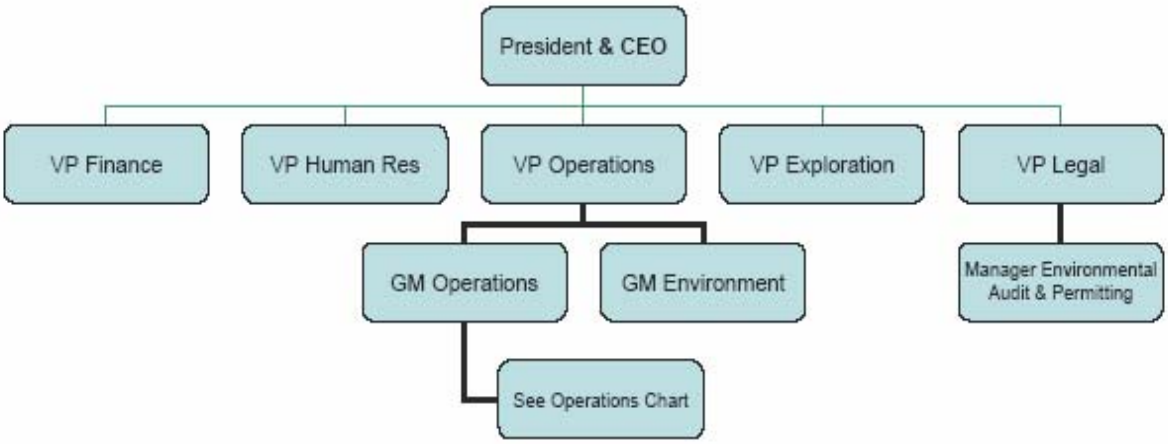
2.3 Distribution

This document will be available at strategic areas on property (through your supervisor as this is a controlled document) to all employees for reference. The Senior Environmental Coordinator is responsible to keep the information current and distribute updates to all participants as required. Copies of this report will be distributed to all stakeholders including Kitikmeot Inuit Association, Environment Canada, Fisheries and Oceans Canada, RCMP Cambridge Bay and Nunavut Department of Environment.

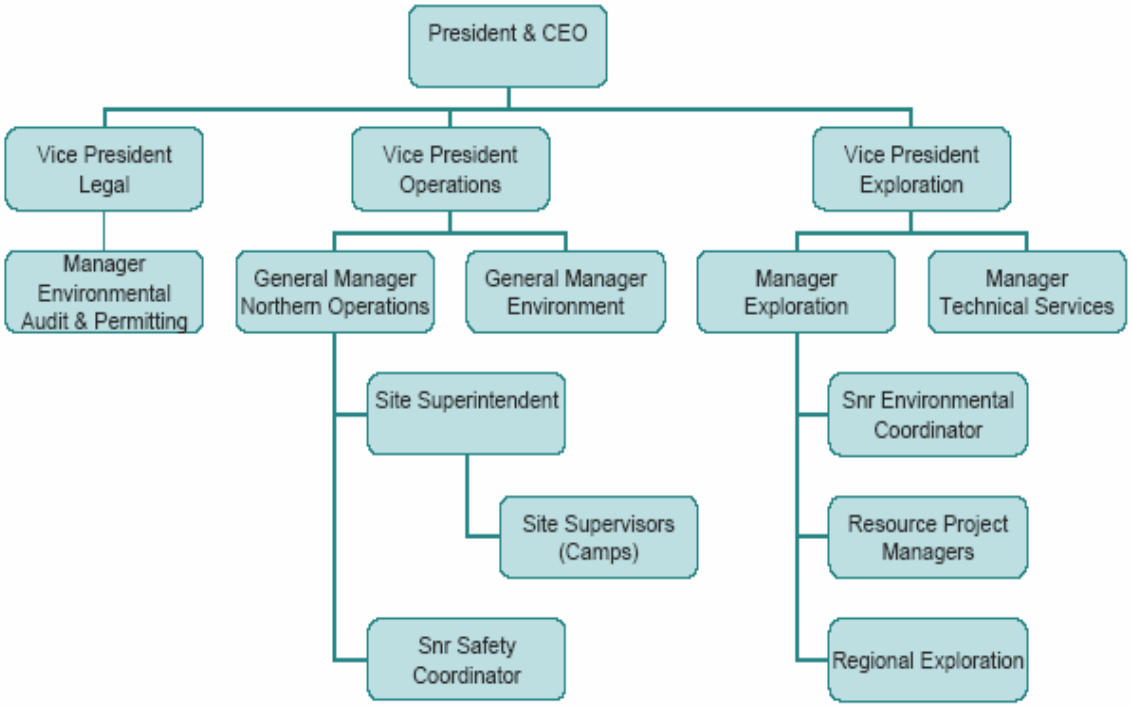
3 ORGANIZATION AND RESPONSIBILITY

The General Manager, Northern Operations has overall control of the camps operational aspect and supplies and all aspects of the response plan. He will be assisted and supported by the Exploration Manager and the Resource Project Managers who responsible for the exploration programs. The implementation of this plan is the responsibility of the Site Superintendent and the Camp Site Supervisors who are responsible for the fuel transportation, handling and storage, the powerhouse and the mechanical shop. The Senior Safety Coordinator and the Senior Environmental Coordinator will also play a supporting role by keeping current with regulations and providing advice during incidents as well as providing liaison with the regulatory agencies. If necessary, the General Manager, Northern Operations can call on corporate personnel: the Vice Presidents of Operation and Exploration, and the General Manager, Environment. The following chart is the chain of command within MHBL.

Figure 2: MHBL Corporate Chain of Command



Exploration Program Operational & Exploration Chain of Command



3.1 Communications

Senior staff will be in daily contact with senior management on site so that decisions can be made in an efficient and timely manner.

The site will be equipped with a satellite receiver and phone system as well as portable radios and a base station at the site office. All front line supervisors will carry a portable radio while working on site. Independent satellite phones will be available for crews working off site and for emergency communications if the phone system fails.

4 EMERGENCY RESPONSE

4.1 Natural Incidents

When a natural disaster such as a flood, earthquake or severe windstorm sufficient to cause damage occurs, carry out the following steps immediately:

- Sound the alarm;
- Designate the Responsible Person;
- Evacuate to muster point or shelter as instructed by Responsible Person;
- Hold a roll call and confirm everyone is accounted for;
- Report any missing personnel to the Emergency Response Team(ERT); and
- Call for outside help as required.
- The safety of the individual takes precedence over all else.

Depending upon the nature of the natural disaster, and whether or not there is any warning, it may or may not be possible to use the designated muster point and shelter. If either or both of the muster point or the shelter are unavailable, then the responsible person shall make alternative plans on the spot, depending upon the circumstances.

4.2 Severe Weather

4.2.1 Severe Cold

All workers will be expected to be familiar with working in the cold weather that is prevalent on site. Workers will receive orientation and training on the proper methods while working in the cold. There will, however be circumstances when work may be restricted because of extreme cold. Procedures will be established for the various work tasks to protect outside workers.

4.2.2 Whiteout Conditions

Cease physical work. This is particularly important for persons using equipment or cutting tools, because any person suffering an injury may be unable to either reach the first aid post, or be evacuated to a hospital until the conditions improve. Personnel are to remain within shelter until the emergency has passed. Remote sites will be equipped with emergency rations and a heat source. Those people working at these sites will be informed to cease work and to remain inside the shelter until the severe weather has passed. No one will be permitted to operate any vehicle (truck or snowmobile) except in extreme emergencies and only with the consent of the Resource Project Managers or Site Supervisors.

4.3 Human Caused Incidents

4.3.1 Facility Fire

Specific fire fighting procedures will be developed and special fire teams will be trained to deal with any special conditions that may be present in the mine mill or other processing facilities on site.

On discovering a fire, carry out the following steps immediately: Small fires that can be safely extinguished should be put out. Ensuring there is a safe exit or retreat and that you fight a fire from fresh air.

- If unable to put the fire out, initiate emergency procedures. Sound the alarm by using the radio;
- Remain calm;
- Report the fire to your Supervisor immediately and provide the following:
- Your Full Name,
- Your location(where you are calling from),
- The Location and size of the fire, and
- The Muster Station you are going to.
- Call out to people in your area to warn them of the danger;
- Evacuate all persons to the muster point;
- Do not pass through smoke;
- Feel all doors before you open them - if they are hot use another route. If no other route is available, return to the closest safe place and close the door;
- Go to the window and open it to get fresh air and call for help;
- Close (but do not lock) all doors behind you, as you leave the area;
- Report to the muster point;
- Hold a roll call and confirm everyone is accounted for; and
- Assign/Designate an Emergency Response Coordinator.

If you are able to put the fire out yourself, make sure the fire is completely out before leaving the scene. Use the radio to inform the site responsible person and inform them of the details. If you must leave the scene of the fire, make sure you or someone trained in fire fighting returns to the fire location to make sure it has not restarted. Maintain a fire watch until there is no chance that the fire will restart.

Once all persons are accounted for, arrange for their temporary shelter if required. The temporary

shelter should be in a suitable place of refuge, separate from and away from the facilities involved, where there are emergency rations, blankets, a method of heating the shelter, and where there are sufficient seats for everybody and an emergency means of communication to the outside world.

No one may re-enter a facility evacuated because of the fire until the Response Coordinator, or his designate, gives the "All Clear" signal. He will ensure the building has been checked out to ensure adequate ventilation is restored and the structural integrity of the building was not compromised.

4.3.2 Ground Fires

Ground fires are an uncommon occurrence in the high arctic however fire-fighting capability will be on hand in the form of pulaskis, back pack water fire extinguishers. In the event of a ground fire, the Nunavut Department of Environment will be contacted immediately. All available resources of the site will be used to assist the NDOE to fight the fire.

4.3.3 Medical Treatment and Emergencies

During all exploration programs, each operational camp will have a full time medic with the appropriate level of training for the number of personnel. The Medic in consultation with the Senior Safety Coordinator will develop the medical treatment and emergency procedures. All emergency procedures will comply with the Nunavut Mining regulations and the Workman's Compensation Board requirements.

4.4 Aircraft

Although most of the supply and re supply will be by sealift, there will be a large number of flights into the site carrying personnel and small cargo. Helicopter exploration flights may also use the site as a base.

4.4.1 Missing or Overdue Aircraft, and Aircraft Accident

Every aircraft transportation company has procedures for tracking overdue and lost aircraft. MHBL will integrate their procedures into this plan and will refer to it in this document. The aircraft company's procedure will be a companion document to this procedure.

However, in the event that a particular aircraft company has no procedure available, we will act as follows:

4.4.1.1 Helicopters

Because of fuel load helicopters will be working within approximately 2 hours of the site. For helicopters using the site as a base, it will be necessary for the pilot to file a flight plan with the MHBL logistics person responsible for aircraft on the site. The following procedure will be followed during helicopter use on site:

- If the helicopter is making short exploration flights to a number of areas then the pilot will

radio to camp on a predetermined schedule, as this will allow a faster response if an incident occurs.

- If there is no contact form the pilot at the predetermined time then the site person will attempt to contact the helicopter on the active frequency.
- Radio contact will be attempted every few minutes until 30 minutes has passed.
- If, after 30 minutes has passed, no contact has been established then the site person will call the helicopter company base to inform them and to ascertain whether the have heard from the pilot on another frequency.
- If other aircraft are in the area, they can be asked to attempt to contact the missing aircraft. If the pilot or crew is carrying a satellite phone then this should be used to attempt contact.
- When all attempts at contact are negative and the helicopter has been over due for 30 minutes the MHBL logistic person responsible will inform the Resource Project Managers and Site Supervisors and the helicopter company that a search should be initiated. The aircraft company will then use its standard operating procedures for overdue aircraft with the full cooperation and resources of MHBL. During this procedure the MHBL will continue to attempt contact with the aircraft.

4.4.1.2 Fixed Wing Aircraft

For the most part the fixed wing aircraft coming to site will be carrying people or supplies. These flights will likely be on prescribed schedule and most certainly have a defined flight plan filed with the originating airport. The MHBL person responsible for the landing strip will always know when an aircraft is scheduled to land. This is necessary to make sure that the landing area is free of debris and animals.

The following procedure is to be used for regular and extra ordinary fixed wing flights:

- After 30 minutes after scheduled arrival time with no contact from the aircraft and no information available, the MHBL logistic person will contact the aircraft company and the originating airport to advise them that the aircraft is overdue.
- If the site has the correct frequencies, the MHBL logistic person will attempt to contact the overdue aircraft and will continue until the aircraft company initiates their search procedure or the authorities take over the communications and the search.
- If there are other aircraft available on site, these will be made available immediately to the organized search.
- Site ERT personnel will be made available to the aircraft company as necessary for the search.
- The MHBL logistic person will inform the Resource Project Managers and the Site Superintendent as soon as the aircraft is deemed to be overdue.
- Do not give out information to unauthorized persons and refer all queries to the aircraft

company or the authorities.

4.5 Vehicle Incidents

There will be few vehicles on site; however, vehicle incidents and accidents are possible. For mishaps involving other vehicles or stationary objects, company procedures will be followed for insurance purposes. All vehicle incidents including near misses will be reported to the General Manager, Northern Operations. Vehicle impacts with wildlife have additional criteria. Wildlife encounters may occur at any time and it is everyone's responsibility to ensure the safety of people and animals on site. Remember wildlife has the right of way. The following procedures will be followed if there is a collision with any wildlife:

- The driver of the collision vehicle must immediately contact the immediate supervisor;
- If the vehicle has killed the animal, remove it from the roadway until it can be picked up;
- If the animal has been badly hurt but not killed you must kill it as quickly as possible to avoid suffering. Remember that hurt animals can be dangerous so do not put yourself in harms way by attempting to handle a wounded animal; and
- The Nunavut Department of Environment must be informed immediately and ask direction on proper disposal.

4.6 Equipment or People Falling Through Ice or Open Water

Travel and equipment over frozen lake or ocean will occur rarely at the site however, if accidents happen the following procedure will be the guide to response.

- First, ensure the safety and well being of personnel involved;
- Note that ice tends to fracture for a considerable distance away from any hole, and a ladder or long plank may be required to spread the weight of any rescuers over a wide area;
- Any person(s) attempting to rescue any other persons who have fallen through the ice will be secured by a rope to a point well removed from the hole, so that they can be hauled to safety if necessary;
- Use a rope to assist anybody in the water to get out. It is difficult to climb onto ice from water in the extreme cold in wet clothes;
- Any persons who have fallen through the ice are to be removed from the ice and water and immediately treated for hypothermia as follows:
    - Move them as soon as possible out of the wind;
    - Get dry clothes on the person;
    - If dry clothing is not available, remove wet clothing and place the chilled person in a sleeping bag;
    - Use a second warm person to provide body heat within the sleeping bag to help

warm up the chilled person if necessary; and

- Arrange for medical attention as soon as possible.

- Where equipment had fallen through the ice, if it is still accessible;
  - Arrange for it to be lifted or towed out as soon as possible; and
  - Ensure that leaks of fuel or engine oils are minimized wherever possible by pumping the fuel from tanks into other containers where this can be safely done without danger of a spill.
- Where a vehicle has gone completely through the ice and is submerged; and
  - Contact the appropriate government spills hot line and ask for advice. Where possible, also contact a specialist contractor to assist or to undertake the recovery of the submerged vehicle.
- Where a recreational boat has capsizes and people are in icy water;
  - Use available inflated boats to initiate the rescue effort;
  - Attend to human first and pull victims out of water;
  - Transport victims ashore;
  - Remove wet clothes and cover with dry blankets;
  - Call camp on radio Channel #1 to dispatch available helicopters for airlift; and
  - Tow capsized boat ashore then attempt recovery.

5 SPILL RESPONSE IN ROBERTS BAY WATERS

5.1 Introduction

This section was developed to provide MHBL personnel with petroleum product spill response guidance specific to the unique climatic and physiographic features of the Arctic environment. It provides general information on typical approaches to dealing with hydrocarbon spills in the marine environment.

All bulk fuels and the majority of hydrocarbon products will be shipped to Doris North Project site by barges and tugs under the operational control of the shipping company. MHBL will ensure that the selected shipping company has an appropriate spill response plan in place with trained responders and appropriate stores of spill response equipment and materials. At the current time, this shipping contractor is Northern Transportation Company Limited (NTCL – www.ntcl.com). MHBL will rely upon NTCL for spill response while bulk fuel and containerized shipments of hydrocarbon-based products are in transit from Hay River to the Doris North site. NTCL have many years of experience with such shipping operations in the Arctic.

MHBL will maintain marine spill response equipment at the Roberts Bay jetty site stored within a Seacan for use while barges are being off loaded. This equipment will include floating containment booms and a small skimmer[1] unit designed to address potential spills during the off-loading process at the Doris North Project site.

Consideration has to be given to the key features of the Arctic Region. Table 1 highlights such factors and considerations.

[1] Note: This equipment was not effective during the 2004 fuel at Windy Lake.

Table 1 Key features of Arctic regions

Environmental Factors
• high density of habitat use during summer seasons
• extreme seasonal ecological sensitivity variations
• unique shores types (ice shelves, glacier margins, ice foot features, tundra coasts)
• unique oceanographic and shoreline seasonal changes (open water, freeze-up, breakup, frozen conditions)
• slow weathering and longer persistence of spilled product
Operational Considerations
• remote logistical support
• need to improvise response using available means until support equipment arrives
• safety in cold, remote areas
• cold temperature effects on the efficiency of equipment and personnel
• boat operations in ice-infested waters during transition periods, winter dynamic ice conditions
• on-ice operations in winter
• seasonal daylight variation
• minimization of damage to permafrost during land-based staging and cleanup operations
• need of aircraft for logistics, surveillance, and tracking

This section of the document applies to all sizes of petroleum product spills. For simplicity, the wide range of crude and refine oils have been grouped into three types, based primarily on viscosity (Table 2). Table 3 presents definitions for three "sea conditions" (calm water, protected water, and open water) for spills of hydrocarbons in the marine environment that are used in this document.

Table 2 Oil viscosity ranges

Viscosity Ranges		
Light **Free flowing (like water)**	**Medium** **Slowly pouring (like molasses)**	**Heavy** **Barely flowing (like tar)**
• Diesel	• Bunker A	• Bunker B and C
• Gasoline	• Fuel Oil No. 4	• Fuel Oil No. 6
• Heating oil	• Lubricating Oil	• Weathered crudes
• Kerosene	• Medium crudes	• Bitumen

Table 3 Definitions of "Sea Condition" used in this document

Response Environment	Significant Wave Height (m)	Wind Speed (km/h)
• Calm water	• Less than 0.3	• Less than 10
• Protected water	• 0.3 - 2	• 10 - 30
• Open water	• 2 or greater	• 30 or greater

5.1.1 Objective

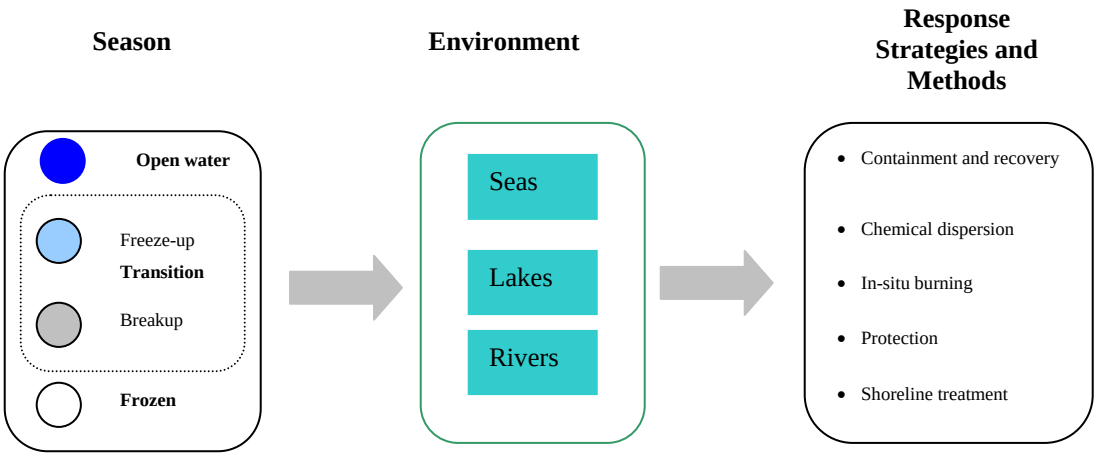
The section focuses on practical spill response strategies and tools for application to open water, ice and snow conditions in remote areas during cold weather. Information is provided relevant to the marine offshore and coastal environments, where bulk petroleum product is transported and where spills pose a threat to the environment and public health.

Marine offshore environments are of great ecological importance in Arctic Regions. MHBL will be moving its petroleum products to support its operation along the Hope Bay Belt using barges during open water season.

5.1.2 Practical Countermeasures

The following practical countermeasures are recommended for first responders, i.e. personnel with a range of technical experience who serve as onsite, trained MHBL employee responders and required to be first at the scene of a spill. Because the responder might receive very limited information when alerted about a spill, this section has been organized on the basis of ***season*** (open water, freeze-up and breakup transition, and frozen conditions as shown in Figure 3. ***Environment*** (seas, lakes and rivers) is a secondary index.

Figure 3 Diagram depicting seasons, environmental conditions and mitigations measures



Seasons are defined as follows:

- Open Water : Water is free of any ice form
- Freeze-up: New ice forming
- Breakup: Old ice melting
- Frozen: Solid, continuous ice is present

The methods of containment and recovery, chemical dispersion, in-situ burning and shoreline treatment are used in the context of the four response strategies:

- Source Control: A spill is controlled at or near its release point to prevent slicks from spreading.
- Control of Free Product: Response operations focus on slicks that have spread some distance from the source.
- Protection: Measures are taken to prevent shoreline and other resources from being contaminated.
- Shoreline Treatment: Product that has come ashore is treated.

5.2 Spill during Open-Water Season

5.2.1 Seas

5.2.1.1 General Guidelines

- MHBL personnel who respond to spills must be trained in the hazards of exposure to low temperatures, accidental immersion in cold water and other causes of hypothermia.
- The most effective way to minimize environmental damage is to focus on source control and to prevent product from spreading.
- Slick tracking and surveillance should utilize locally available resources to determine optimum response strategies:
    - Locate brown-colour slicks to be skimmed, burned and/or dispersed
    - Leave shiny, rainbow sheens to disperse naturally but plan for shoreline protection/treatment, if appropriate
    - In breaking waves higher than 1 m, surveillance and monitoring might be the only practical response options.

Table 4 presents description of countermeasures that are recommended for implementation in an uncontrolled environmental incident.

Table 4 Open-water response at sea or coastal waters

Environment		Responses			
Response	Product Location	Countermeasures			Feasibility
		Contain/recover	Burn	Disperse	
Source Control	On surface	• Mobile floating barriers • Stationary skimmers	Burn on water contained in booms	• Vessel dispersant application • Aerial dispersant application	Recommended
	Underwater	• Subsurface barriers			Not recommended
Control of Free Product	On surface	• Mobile floating barriers • Advancing skimmers	Burn on water contained in booms	• Vessel dispersant application • Aerial dispersant application	Recommended
	Underwater	• Subsurface barriers			Not Recommended
Protection	On surface	• Diversion booming	Burn on water contained in booms	• Vessel dispersant application • Aerial dispersant application	Recommended
	Underwater	• Subsurface barriers			Not Recommended

5.2.1.2 Response Strategies and Methods

Responding to spills from vessels and barges can involve controlling slick at source and removing product that escapes initial containment. The objective of both operations is to minimize the spreading of spilled product and subsequent environmental impacts. Control methods use similar approaches at source and to deal with remote slicks.

5.2.1.2.1 Containment and Recovery

5.2.1.2.1.1 Containment

- Use mobile floating booms best used downdrift from the release point to contain and concentrate product;
- Deploy mobile floating booms in U, V or J configurations. Interception of free-floating, thick slicks is not as effective as containment and removal of product at surface; and
- Mobile floating booms are effective in currents less than 0.5 m/s (1 knot) and winds less than 35 km/h (20 knots).

5.2.1.2.1.2 Recovery

- Advancing skimmers (Oleophilic Skimmers – units with a recovery mechanism to which oil adheres) are useful: Disc, drum and rope mop skimmers can remove light and medium viscosity oils; brush and belt skimmers can collect heavy oils;
- Large volume advancing skimmers can be used when oil/water separators are available or when there are large accumulations of thick, emulsifying oil;
- Subsurface barriers should be used to contain spilled oil that might sink before it submerges, if possible. Locating submerged oil is difficult, and control and collection is even more difficult;
- If brush or belt skimmers cannot collect heavy, floating oil then trawl systems can be tried for recovery;
- Planning adequate storage capacity is critical to the entire response operation to avoid operation bottlenecks; and
- Storage options include barges, towable tanks, tankers and/or other means that are appropriate for the type and volume of oil being recovered.

5.2.1.2.2 Dispersion

- Within mobile floating barriers, spills must be assessed to determine if dispersants will be effective and then treated quickly by trained personnel:
    - The oil should have a viscosity less than 10000 cSt, i.e. it should be less viscous than molasses;
    - The temperature of the water should be above the pour point of the oil, i.e., the oil should be freely flowing;
    - Slick thickness should be no more than 0.1 mm thick; and
    - Spraying operations should be conducted within 2 -5 days of a spill occurring when the oil is unweathered and can be dispersed.
- Within mobile floating and stationary barriers, both vessels and aircraft can be used to apply dispersants. Operations should be directed from aerial vintage points:
    - Use stock piles of chemicals located strategically to the spill site at dispersant-to-oil ratios of 1:10 to 1:100;
    - Use fix-wing planes and helicopters on offshore spills;
    - Vessels are more practical for nearshore coastal waters; and
    - Record information on dosage rates, areas treated and apparent effectiveness so that the data can be transferred to subsequent responders.

5.2.1.2.3 In-situ Burning

- In-situ burning must be quickly implemented, usually by trained personnel. In a remote area, the decision to burn should be based on the following factors:
    - Emulsion should be at least approximately 75% oil;
    - Slick thickness should be greater than 2-3 mm;
    - Waves should be less than 2 m high and not breaking;

  - Wind speed should be less than 35 km/h (20 knots); and
  - Crude oil should be burned within 2-5 days of the spill.

- An ignition system is needed; fire-resistant boom and spotter aircraft should be used, if available.
- A safety plan for response workers is required that addresses the location of ignition, burning and areas that would be affected by the smoke plume.
- Crude oil high sulphur content would likely present health and safety concerns either in an unburned state or upon ignition.
- A 10 km (6 mile) downwind exclusion zone provides adequate protection for response workers, the public and wildlife.
- Ensure that the risk of secondary fires is minimized or have the means to extinguish the burn.
- No burning should take place until KIA and/or regulatory authorities give approval.

5.2.1.2.4 Protection

Protecting resources in the spill path usually involves the deployment of mechanical equipment but may be accomplished by chemical dispersion or burning. The objective of protection is to prevent or minimize contact between the spilled oil and the resource at risk.

- Initially, estimate the direction and speed of movement of the oil. Then identify the resources at risk from the spill and evaluate whether protection operations actions are likely to be successful, and then take the following actions for mechanical containment and removal strategies:
  - Deploy diversion boom with both top and bottom tension members and high reserve buoyancy to exclude or divert oil; and
  - Secure and then regularly monitor anchor systems.
- Using stationary skimmer such as smaller oleophilic skimmers, e.g., disc, drum and rope mops units, to remove light and medium viscosity oils for storage in either water – or land-based storage systems.
- In storm surges, protection strategies might not work if oil mixes in the surf zone and if booms fail.
- In-situ burning is a possible protection option in nearshore waters, using an ignition device (s) in concentrated oil; fire-resistant booms and spotter aircraft should be used, if available.
- A safety plan for the burn operation must be prepared that considers the potential impacts of the burn, amenities at risk and the possible health effects of the smoke plume, e.g., 10 km (6 miles) downwind exclusion zone, sulphur content of crude and the means to extinguish the fire.
- Chemical dispersion is a possible protection technique in coastal waters characterized by:

  - Good flushing; and
  - Water depth greater than 10 – 20 m.

- For effective dispersion, oil must meet the following criteria:
  - Viscosity is less than 10 000 cSt, i.e., less viscous than molasses;
  - The temperature of the water is above the pour point of the oil, i.e., the oil is freely flowing; and
  - Slick thickness is more than 0.1 mm thick.
- Vessel application is likely to be as, or more effective than, aerial methods if:
  - Dispersant is applied within 2 – 5 days of spill;
  - The spill covers a relatively small coastal area that can be readily treated with dispersants from vessel;
  - Dispersant supplies and fuel are positioned on vessels and at selected sites onshore so that downtime is minimized; and
  - Good access to, and visibility of, slicks exists.
- Information on dosage rates, areas treated and apparent effectiveness should be recorded so that the data can be transferred to subsequent responders.

5.2.1.2.5 Shoreline Treatment

- First response activities usually take places on a shoreline only if available resources are not required for source control, recovery of free oil or protection. This might be the case for a land-based spill, e.g., a tank farm, or if all or most of the oil has washed ashore.
- Low pressure, cold-water wash is generally practical and effective before the oil has weathered, i.e., in the early stages of a spill, on:
  - Impermeable (bedrock, man-made) shore types;
  - Fine sediment beaches or flats (sand, mud); and
  - Vegetated shores (marshes, peat, low-lying tundra).
- On sheltered, low wave-energy shores with fine sediment, trenching can be rapid and effective method for containing stranded oil and preventing further redistribution. Oil in the trench can be removed by vacuum trucks. If such system is not available in remote areas, sufficient bags of corn-cobs should be used to absorb the remaining oil in the trench.
- Use manual and/or mechanical removal to recover oil on open beaches with wave action. Often it is important to remove oil that is on surface before the oil, sediments are reworked by wave action, and the oil is possibly buried.
- If oily waste generation and its disposal are issues (which is common in Arctic and many remote areas), mixing and sediment relocation on beaches are likely to be practical and highly effective since the oil would be relatively unweathered. Mixing (also known as tilling) and sediment reworking (surf washing) involve the use of earthmoving equipment to move oiled sediments so that they are exposed to weathering processes, such as evaporation or wave action, to accelerate natural cleaning of an oiled beached. The techniques do not involve mechanical removal of oiled sediments from beach for disposal.

- Land-based operations should avoid disturbances to the permafrost and the active layer above it, e.g., digging, the use of tracked vehicles and uncontrolled burns.

Table 5 list recommended initial treatment methods according to various shore type in an even of an uncontrolled environmental incident.

Table 5 Recommended initial treatment methods of an uncontrolled environmental incident.

Environmental Habitats - Shore Type	Recommended Initial Treatment Methods
Bedrock	• Low-pressure, cold water wash • Manual removal • Vacuum system
Man-made solid structures	• Low-pressure, cold water wash • Manual removal
Ice or ice covered shores	• Low-pressure, cold water wash • Low-pressure, warm or hot water wash • Manual removal • Vacuum systems • Burning
Sandy beaches	• Flooding • Low-pressure, cold-water wash • Manual removal • Mechanical removal • Mixing • Sediment relocation
Mixed-sediment beaches	• Flooding • Low-pressure, cold-water wash • Manual removal • Mechanical removal • Mixing • Sediment relocation
Pebble/cobble beaches	• Low-pressure, cold-water wash • Manual removal • Mechanical removal • Mixing • Sediment relocation
Boulder beaches and rip-rap	• Low-pressure, cold-water wash • Manual removal • Passive sorbents
Sand flats	• Low-pressure, cold-water wash • Manual removal • Vacuum systems • Mechanical removal
Mud flats	• Low-pressure, cold-water wash • Manual removal • Vacuum systems • Mechanical removal
Salt marshes	• Flooding • Low-pressure, cold-water wash • Manual removal • Vacuum systems • Passive sorbents
Peat shores	• Flooding • Low-pressure, cold-water wash

	• Manual removal • Vacuum systems • Mechanical removal
Inundated low-lying tundra shores	• Flooding • Low-pressure, cold-water wash • Manual removal • Vacuum systems
Tundra cliff shores	• Low-pressure, cold-water wash • Manual removal • Vacuum systems • Mixing • Sediment relocation
Shorelines with snow	• Vacuum systems • Manual removal • Mechanical removal • Burning

6 GENERAL SPILL RESPONSE PLAN

6.1 Introduction

The roles and responsibilities of Hope Bay Exploration Project personnel, contractors, and Government are described. Response and reporting procedures are also outlined.

6.2 Purpose

Recognizing that spills or leaks of petroleum products and chemical substances have the potential of posing a variety of hazards and can endanger both short or long term public health and the environment, MHBL has developed and implemented this Spill Response Plan to address accidental releases of hazardous substances. Hazards that may exits at Exploration Camps and Regional worksites include the release of toxic vapors, fire, spills, and explosions.

6.3 Objectives

Principal objectives of the Spill Response Plan are:

- To provide information to cleanup crews, employees, contractors, KIA, and government agencies in the event of a spill;
- To promote the safe and effective recovery or disposal of spilled materials;
- To comply with the Miramar Hope Bay Limited (MHBL) environmental safety policies
- To comply with federal and territorial regulations pertaining to the preparation of contingency plans and reporting requirements; and
- To minimize the negative impacts of spills on the receiving environment (water/ice and/or land).

6.4 Scope

This Plan addresses the organization of the Hope Bay Exploration Project spill response and related emergency measures. Alerting and notification procedures and cleanup strategies are outlined along with the duties and responsibilities of key spill response personnel.

The petroleum derived materials included in this Plan can generally be divided into two categories:

- flammable immiscible liquids; and
- flammable compressed gases.

6.4.1 Flammable Immiscible Liquids

These substances are all hydrocarbon-based and will ignite under certain conditions. Gasoline and aviation fuel pose the greatest fire (and safety) hazard and usually cannot be recovered when

spilled on water. The remaining materials generally do not pose a hazard at ambient temperatures. They are all insoluble, float unless mixed into the water column and can be recovered when safety allows. They are:

- Gasoline Low Flash Point (burns easily);
- Jet A;
- Turbo B;
- Diesel Fuel;
- Waste Oil; and
- Lube Oil High Flash Point.

6.4.2 Flammable Compressed Gasses

- Usually highly explosive;
- May be heavier than air and therefore concentrate in low lying locations; and
- May be lighter than air and highly noxious or toxic.
- Propane, acetylene and oxygen are the most likely flammable gases to be on site.

6.4.3 Other Products

Because of the nature of the milling process, there are chemicals and reagents that are needed for use in the gold abstraction process. These products are:

- Reagents such as Sulphuric Acid, Sodium Chloride and Calcium Chloride;
- Explosives (ammonium nitrate fertilizer, emulsions and high explosive(stick Powder));
- Domestic sewage; and
- Petroleum contaminated soil.

Specific response procedures with the MSDS sheets will be available on site and available to the regulatory agencies.

6.5 Spill Response

6.5.1 Responsibilities

During the training (see section 9) site personnel will learn their roles in a spill incident. The following are the roles for the Hope Bay Exploration and On-site Contractor Personnel.

6.5.1.1 On scene – First Respondent:

- Assess the initial severity of the spill and note any safety concerns;

- Report the incident to immediate supervisor immediately;
- Determine the source of the spill and stop or contain it, if possible; and
- Participate in spill response as member of cleanup crew.

6.5.1.2 General Manager, Northern Operations

- Reports the spill to Nunavut 24-Hour Spill Report Line at (867) 920-8130;
- Decides if additional equipment is required o contain and clean up spills;
- Records the time of the report, source of information and details on location, size, type of pill as well as any other information available on the spill report form;
- Oversees the cleanup operation until it is completed satisfactorily;
- Notifies government agencies and Miramar Corporate Personnel on spill details;
- Oversees completion and distribution of Spill Report;
- Responsible for all communication with the media;
- Ensures that all press releases are accurate and in accordance with company policy;
- Ensures all reporting requirement are met to MHBL standard and regulative requirements;
- Initiates Mutual Aid Agreements if response requires outside assistance; and
- Ensures investigation identifies.
    - Measures to prevent similar spills in the near future; and
    - Ensures Emergency Response Team members are adequately trained in spill response.

6.5.1.3 Site Superintendent and Site Supervisors:

- Supervise the Emergency Response Team;
- Assist in initial and ongoing response and recovery efforts;
- With work crew, take initial action to prevent further mishap to people, property or the environment;
- Continue actions until relieved or supplemented by other Supervisors;
- Decide with On-Scene Response Coordinator if mobilization of additional equipment from Emergency Response Organization or Contractor is warranted; and
- If petroleum product has found its way into a water body, assess whether burning is a viable clean up measure; by consultation with regulatory authorities.

6.5.1.4 Emergency Response Team:

- Take appropriate response measures;
- Conduct recovery process under direction of On-Scene Emergency Response Coordinator;

- Deploy booms, sorbents and other equipment and materials as required; and
- Continue cleanup as directed by Emergency Response Supervisor until relieved.

6.6 Emergency Contacts

- The General Manager, Northern Operations or his designate is responsible to:
    - By phone, contact the regulatory authorities within 24 hours of a reported major spill; and
    - Fax in the Nunavut/NWT Spill Report Form.
- If the volume spilled required by mandatory reporting as specified in Schedule B from the Regulation R-068-93 Spill Contingency Planning And Reporting Regulations(July 22 1993) Consolidation Issued July 15 1998 (see Appendix C), the General Manager, Northern Operations (using the Nunavut Spill Report Form) is responsible to notify the Nunavut Spill Report line **(867 920 8130)** and the Kitikmeot Inuit Association Lands Manager **(867 982 3310)**.

Table 6 Notification Contact List

Organization/Personnel	Contact Information
Nunavut/NWT 24 hour Spill Report Line	867 920 8130
Environment Canada – Environmental Protection Emergency 24 Hrs.	867 920 6060
RCMP	867 983 1111
Emergency Measures Organization Nunavut	867 979 6262 After hours 800 693 1666
Department of Fisheries and Oceans	867 979 6274
Miramar Mining Corporation Head Office North Vancouver B.C.	1 604 985 2572
Site Medic	To be advised
General Manager, Northern Operations	1-867-766-5311
Senior Environmental Coordinator	1-800-663-8780
Kitikmeot Inuit Association Lands Manager	867 982 3310

6.6.1 Log of Contacts

- The General Manager, Northern Operations or designate will maintain a log of all external contacts made which will include the date, time and organization contacted, essence of the notice or information transmitted/received, whenever possible the name and title of individuals receiving or issuing notification or instructions.

6.6.2 Communications

- The General Manager, Northern Operations will maintain a standby position at the site or a regional office (Vancouver or Yellowknife) , or designate some other competent person, in order to maintain spill related communications; and
- Depending on the severity of the spill, any outside help if required is the responsibility of the General Manager, Northern Operations.

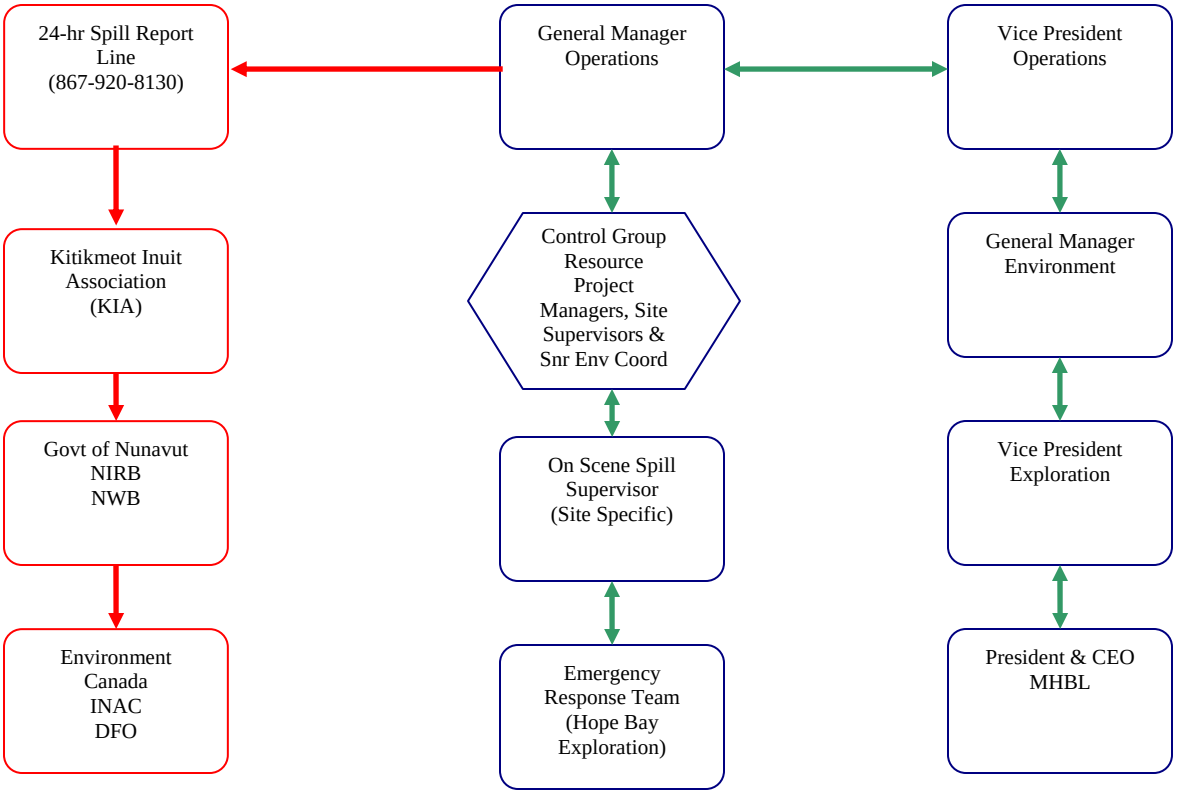
6.7 Discovery and Response

- Any employee noticing an environmentally hazardous spill is required to notify immediately their supervisor or the onsite Resource Project Manager or the Site Supervisor; and
- The person reporting will try to ascertain whether there is a danger to life and if it is safe attempt to stop the spill.

6.7.1 Response

- The Emergency Response Coordinator shall proceed immediately to the scene where he/she will make an assessment of:
    - Specific hazards of an imminent nature that may endanger life of humans or animals;
    - The type of material spilled;
    - The estimated quantity;
    - The potential for further spillage; and
    - Criteria and equipment required to contain and clean up the spill.
- The Emergency Response Coordinator will advise the Site Superintendent, the Resource Project Manager and the General Manager, Northern Operations of any additional notifications that depend on the quantity (see Appendix C) that he/she believes are necessary. The Emergency Response Coordinator will also advise if any additional outside equipment is needed.
- The Emergency Response Coordinator will then directly control all activities relating to the stemming of additional flow or escape, containment and extraction of spilled material and the restoration of the site.
- The Emergency Response Coordinator will ensure that containment and recovery equipment is available on site in such quantities and character to sufficiently respond to the most serious spill condition identified through the materials inventory.
- The General Manager, Northern Operations will liaise with MHBL CEO, Vice Presidents – Operations, Exploration and General Manager Environment, Regulatory Agencies and the KIA to keep them informed as to the status of the ongoing operations.

Figure 4: Chain of Communication for Spill Response



6.8 Disposal

- The disposal of spilled material and/or contaminated soil is governed under the Waste Management Act and its regulations. A copy of the Act and the Special Waste Regulation and the Contaminated Sites Regulation will be maintained on site for reference.
- Clarifications and information regarding waste management and disposal issues can be obtained from the Nunavut government and DIAND. Two approved Land Treatment Area (LTA) are currently in operation on the Belt. One is located atWindy Camp and the other is located at Windy Lake camp. Petroleum contaminated top soil will be removed and placed in these LTA for treatment. In situations where these facilities are have reached maximum capacity, contaminated top-soil will sealed in 45-gallon drums and transported offsite to approve facilities in Yellowknife for disposal purposes.
- The Emergency Response Coordinator, the Site Superintendent and the General Manager, Northern Operations in consultation with the Senior Environmental Coordinator shall investigate the most appropriate disposal options for the spilled material. Disposal may include burning, disposal in waste areas or recycling.

6.9 Documentation and Reporting

- The Emergency Response Coordinator or a designate will be responsible to attend the scene of any spilled materials or contaminated soils to photograph and measure the affected area. They shall be responsible to engage properly qualified personnel to collect samples of the materials or soils. No person should sample or handle spilled hazardous materials unless the person has received adequate training in safe sampling procedures, use/selections of protective clothing and identification of the hazards associated with the respective spilled material.
- The General Manager, Northern Operations will submit a detailed report to the appropriate agencies within thirty (30) days starting from the day of the reported spill. Progressive reports are submitted regularly until the completion of remedial activities. The report will include but not be limited to:
    - Reporting person's name and telephone number;
    - Name and telephone number of the person/company who caused the spill;
    - Location and time of the spill;
    - Type and quantity of the substance spilled;
    - Cause and effect of the spill;
    - Details of action taken or proposed;
    - Description of the spill location and of the area surrounding the spill;
    - Details of further action contemplated or required;
    - Names of agencies on the scene;
    - Names of other persons or agencies advised concerning the spill;
    - Chronological sequence of events including internal and external notifications;
    - Copies of analytical results from external laboratories; and

- Analysis of the events leading up to the spill, and a critique of the internal response and handling of the incident.

6.10 Spill Equipment

- Spill kits will be placed in the following locations:
  - Tank Farm;
  - Refueling Station;
  - Incinerator;
  - Power House;
  - Water Intake;
  - Reagent Storage area;
  - Landing Dock;
  - Fuel Delivery truck;
  - Jetty;
  - Workshop;
  - Airstrip, Helipad; and
  - Drill sites.
- Each spill kit will contain a minimum of:
  - 1 roll absorbent;
  - 2 plug and dyke kits;
  - 1 3mx 4m tarpaulin;
  - 2 Tyvek suits;
  - 4 mini booms;
  - 25 spill pads;
  - 2 pr of neoprene gloves;
  - 2 splash proof goggles.
- The earth moving equipment such, loaders, and backhoes are also available for constructing dykes and moving contaminated material. The fuel delivery truck will carry a spill response kit containing absorbent pads and material as well as large disposal bags for small spills.

7 WILDLIFE ENCOUNTERS

- Wildlife encounters pose a risk for stress or injury to both site personnel and wildlife. Control measures and environmental protection procedures have been put in place to minimize this risk to wildlife and humans. Of particular importance is the proper handling of kitchen refuse. MHBL employees, consultants, or contractors involved in outcrop mapping, monitoring, sampling, surveying or drilling, lunch bags and leftovers must be brought back to camp for proper disposal.
- Report and record all wildlife sighting to the Site Supervisor.
- No attempt to chase, catch, divert, follow or otherwise harass wildlife by any form of motorised mode of transportation will be made by any person at the MHBL Project sites. The only exception is when a bear is sighted in close proximity of the camp or work areas; attempts will be made to scare off the bear with a motorised form of transportation. This approach has to be approved by the Site Supervisor;
- Equipment and vehicles will yield the right-of-way to wildlife;
- When nuisance animals (e.g. grizzly bears, wolves) are identified at the MHBL exploration sites, and pose immediate danger to the safety of the employees, the Site Supervisor will be responsible for all subsequent actions. The Site Supervisor in consultation with the Senior Management Personnel at site who may consult regulatory authorities will determine responsive actions. All actions must comply with the regulative requirements and directives;
- The Site Supervisor may first use deterrent measures that include crackers and rubber bullets;
- In an event where all deterrent measure have failed to deter a nuisance animal, and based on risks posed to the safety of the employees or camp residences, the Site Supervisor will determine if an animal is to be put down and will designate a licensed person who will destroy the animal. The only firearm(s) allowed within the MHBL exploration camps are those under the control of the Site Supervisor (or his/her designate). Anytime an animal is put down, the regulatory authorities will be notified by phone;
- Any bear that has been put down will have the head removed, and will be skinned and preserved. The carcass will be provided to the local community or in an event where transportation is difficult to arrange, the carcass will be incinerated on site;
- An internal incident report will be completed by the Site Supervisor within 72 hours of the putting down of a bear and kept on property; and
- The report of the displacement or putting down of a bear shall be submitted to the Senior Environmental Coordinator for inclusion in the MHBL monthly report to the regulating authorities.

8 ARCHAEOLOGICAL AND HISTORICAL DISCOVERIES

- All new archaeological and historical discoveries will be reported;
- Employees are not to disturb any suspected archaeological or historical sites. Any such suspected site must be left alone and reported immediately to your immediate supervisor. Taking souvenirs or disturbing such sites is illegal no matter how small the site or how insignificant it may appear to the employee;
- Within any area proposed for intensive development and/or exploration, all efforts will be made to identify all heritage resources present. MHBL will avoid archaeological sites whenever possible. When avoidance is not possible, MHBL will contact regulatory authorities and take appropriate as required. All pertinent data will be gathered for each identified archaeological site to develop appropriate mitigation recommendations;
- Subsurface evaluative testing should be conducted at potentially threatened sites to determine if buried cultural deposits are present;
- All testing and collection must be done under an approved plan and conducted by an archaeologist holding a valid archaeological permit;
- MHBL will endeavor to have a qualified archaeologist obtain a Nunavut Territory Archaeologist Permit under such circumstances;
- Scientific and cultural analysis and interpretation of the archaeological data collected during mitigation is an integral part of the process and will be undertaken on behalf of MHBL in a timely fashion;
- MHBL will work with both archaeologists;
- Local Inuit groups on issues related to site interpretation. Protocols for dealing with archaeological sites are contained in the Doris North (Hope Bay) Heritage Resource Protection Plan 2005; and
- Contact the Senior Environmental Coordinator immediately when a potential site is detected or suspected.

9 TRAINING

9.1 Orientation and Training

All employees, contractors and visitors will be introduced and instructed on the policies and procedures established with this plan. Area specific inductions will be given to individuals working in high activity areas such as the drill sites and core shack.

Safety and Environmental concerns and awareness will also be discussed at every safety meetings and at the start up of any new operations that may affect the environment. If an incident happens all employees will be informed and re-instructed and retrained as deemed necessary.

The training for spill response will be part of the worker orientation at all Hope Bay Explorations Caps and Regional worksites. All personnel will be made aware of the products present on site through the orientation program and the availability of Material Safety Data Sheets (MSDS) in prominent locations. Supervisors who will fill the role of an Emergency Response Coordinator or part of the Clean-up Crew will receive a more detailed training allowing them to respond quickly and safely to any spill on the mine site. All employees on site will have valid WHIMS certificates and will be familiar with MSDS.

Each employee will be made aware of the locations of storage facilities and the locations of spill containment and recovery equipment.

9.2 Responsibilities

The ultimate responsibility for up-to-date emergency training plans is with the Senior Safety Coordinator. The Senior Safety Coordinator and the Senior Environmental Coordinator, in consultation with the General Manager, Northern Operations and the Exploration Manager or designates will review the emergency preparedness and response procedures on a annual basis or as required. Review of the emergency response procedures will include the periodic verification of any telephone number contacts for the various organizations that may be needed. Such verification shall be undertaken at a minimum of once per year. Revisions will be made to the procedures where necessary to comply with changing site conditions and any new relevant legislation. Personnel will be notified on any changes and if necessary retraining will take place. In the case that someone other than the Senior Safety Coordinator and the Senior Environmental Coordinator conducts these reviews, findings of these reviews be made available to the Senior Safety Coordinator and the Senior Environmental Coordinator for review, and for possible improvements in the procedures.

9.3 Drills and Practices

The responsibility for carrying out annual drill is the responsibility of the Site Superintendent and the Site Supervisors. Personnel at all MHBL camps will undertake periodic testing of the emergency response procedures. These tests will be undertaken on a twice-yearly basis. These intervals shall be more frequent if there is a high turnover of employees at the site. The outcome

of each exercise is to be recorded, and reviewed for areas of improvement by the Responsible Person for the respective area. The findings will be forwarded to the Senior Safety Coordinator and the Senior Environmental Coordinator.

9.3.1 Areas Covered

Emergency preparedness training must, at a minimum, address the following:

- Medical emergency, accident or fatality;
- Fuel spill or effluent spill or leak;
- Fire;
- Extreme cold emergency;
- Equipment or people falling through ice or in open water;
- Aircraft missing or crash;
- Wildlife (bear) in camp;
- Missing person(s); and
- Winter survival training.

10 EMPLOYEE SAFETY HANDBOOK

MHBL believes that all incidents and near misses are preventable. An employee safety handbook has been developed and will be given to each employee upon completion of the Site Induction process. The handbook will be updated from time to time as new information or experience comes available.

The Senior Safety Coordinator is responsible for keeping the Employee Safety Handbook current. The Site Superintendent and Site Supervisors will ensure the Employee Safety Handbook are made available to each new employee upon arrival at any MHBL property along the Belt.

11 REFERENCES

Contingency Planning and Spill Reporting in Nunavut A Guide to the new Regulations, Department of Environment, Iqualuit, Nunavut.

Consolidation of Regulation R-068-93 *Spill Contingency Planning and Reporting Regulations* (Dated 22 July, 1993); Department of Environment, Iqualuit, Nunavut.

Mine Health and Safety Regulations, Government of Nunavut.

MHBL Exploration Environmental Protection Plan, March 16 2006

12 APPENDIX A

Spill Procedures for Products on Site

DIESEL / P40 / P50, HYDRAULIC, LUBE and WASTE OIL

CONSIDER ACTION ONLY IF SAFETY PERMITS! ELIMINATE IGNITION SOURCES. If safe, stop the source of spill

On Land	• Block entry into waterways; • Do not flush into sewer/drainage system; • Contain spill by dyking with earth or other barrier; • If liquid, remove minor spills with sorbent, large spills with pumps or vacuum equipment; and • Prills /granules can be shoveled or removed mechanically.
On Snow and Ice	• Block entry into waterways and contain with snow or other barrier; • Remove minor spills with sorbent pads and/or snow; • Use ice augers and pump to recover diesel under ice; • Slots in ice can be cut over slow moving water to contain oil; and • Burn accumulated diesel from the surface using Tiger Torches if feasible and safe to do so.
On Tundra	• Do not flush into ditches or drainage systems; • Block entry into waterways and contain with earth, snow or other barrier; • Remove small spills with sorbent pads; • On tundra use peat moss and leave in place to degrade, if practical; • Do not deploy personnel and equipment on marsh or vegetation; • Remove pooled diesel with pumps and skimmers; • Flush with low pressure water to herd diesel to collection point; • Burn only in localized areas, e.g., trenches, piles or windrows; • Do not burn if root systems can be damaged (low water table); and • Minimize damage caused by equipment and excavation.
On Water	• Contain spill as close to release point as possible; • Use spill containment boom to concentrate slicks for recovery; • On small spills, use sorbent pads to pick up contained oil; • On larger spills, use skimmer on contained slicks; and • Do not deploy personnel and equipment onto mudflats or into wetlands.
Streams	• Prevent entry into water, if possible, by building berm or trench; • Intercept moving slicks in quiet areas using (sorbent) booms; and • Do not use sorbent booms/pads in fast currents and turbulent water.
Storage and Transfer	• Store closed labelled containers outside away from flammable sources; and • Electrically ground containers and vehicles during transfer.
Disposal	• Segregate waste types; • Place contaminated materials into marked containers; and • Consult Site Services Manager on disposal procedures.

JET A, JET B & Gasoline

CONSIDER ACTION ONLY IF SAFETY PERMITS! ELIMINATE IGNITION SOURCES. If safe, stop the source of spill immediately.

On Land	• Block entry into waterways; • Do not flush into ditches sewer/drainage system; • Contain spill by dyking with earth or other barrier; • If liquid, remove minor spills with sorbent, large spills with pumps or vacuum equipment; and • Prills /granules can be shoveled or removed mechanically.
On Snow and Ice	• Block entry into waterways by dyking with snow or other barrier; • Do not contain spill if there is any chance of igniting vapours; and • In work/depot yards, apply particulate sorbents.
On Tundra	• Block entry into waterways by dyking with earth, snow or other barrier(s); • Do not contain spill if there is any chance of igniting vapours; • On shop floors and in work/depot yards, apply particulate sorbents; • On tundra use peat moss and leave to degrade if feasible to do so; • Remove pooled liquid with pumps, if safe to do so; • Do not deploy personnel and equipment on marsh or vegetation; • Low pressure flushing can be tried to disperse small spills; • Burn CAREFULLY only in localized areas, e.g., trenches, piles or windrows; • Do not burn if root systems can be damaged (low water table); and • Minimize damage caused by equipment and digging.
On Water	• Contain or remove spills ONLY AFTER VAPORS DISSIPATE; • Use booms to protect water intakes; and • Skimming can be tried once light ends evaporate.
On Streams	• Prevent entry into water, if possible, by building berm or trench; • Intercept moving slicks in quiet areas using (sorbent) booms; and • Do not use sorbent booms/pads in fast currents and turbulent water.
Storage and Transfer	• Store closed, labeled containers in cool, ventilated areas away from incompatible materials; and • Electrically ground containers and vehicles during transfer.
Disposal	• Segregate waste types; • Place contaminated materials into marked containers; and • Consult Site Services Manager on disposal procedures.

ANTIFREEZE (ETHYLENE GLYCOL)

CONSIDER ACTION ONLY IF SAFETY PERMITS! If safe, stop the source of spill

On Land	• Block entry into waterways; • Do not flush into ditch/drainage system; • Contain spill by dyking with earth, snow or other barrier;; • Remove minor spills with peat moss and/or sorbent pads; and • Remove large spills with pumps or vacuum equipment.
On Snow and Ice	• Block entry into waterways by dyking with snow or other barrier; • Do not contain spill if there is any chance of igniting vapours; • In work/depot yards, apply particulate sorbents; and • Remove contaminated snow with shovels or mechanical equipment.
On Tundra	• Do not deploy personnel and equipment on marsh or vegetation; • Block entry into waterways by dyking with earth, snow or other barrier(s); • On shop floors and in work/depot yards, apply particulate sorbents; • Low pressure flushing can be tried to disperse small spills; • Burning is not feasible; and • Minimize damage caused by equipment and digging.
On Water	• Ethylene glycol sinks and mixes with water; • Contain spill by isolating contaminated water through damming or diversion; and • Use spill containment boom to protect water intakes and sensitive areas.
On Streams	• Prevent entry into water, if possible, by building berm or trench; • Intercept moving slicks in quiet areas using (sorbent) booms; and • Do not use sorbent booms/pads in fast currents and turbulent water.
Storage and Transfer	• Store closed labelled containers in cool, ventilated areas away from incompatible materials, e.g., oxidizable materials, finely divided metals and organics.
Disposal	• Segregate waste types; • Place contaminated materials into marked containers; and • Consult with environmental authorities during final disposal

RAW SEWAGE

CONSIDER ACTION ONLY IF SAFETY PERMITS! Avoid direct contact with raw sewage. If safe, stop the source of spill

On Land	• Block entry into waterways; • Do not flush into ditch/drain systems; • Contain spill by dyking with earth or other barrier; • Remove spill with pumps or vacuum equipment; and • On tundra use peat moss and leave in place to degrade, if feasible.
On Snow and Ice	• Block entry into waterways; • Contain spill by dyking with snow or other barrier; • Do not flush into ditch/drain systems; and • Remove contaminated snow with shovels or other mechanical means.
On Tundra	• Do not deploy personnel and equipment on marsh or vegetation; • Remove pooled sewage with pump or vacuum equipment; and • Minimize damage caused by equipment and excavation.
On Water	• Isolate/confine spill by damming or diversion if feasible; and • If not possible to confine and pump, disperse using water flushing
Storage and Transfer	• Store closed, labelled containers in cool, ventilated areas; and • Avoid contact with collected material.
Disposal	• Place contaminated materials into marked containers; • Transport to sewage treatment plant; • Dispose of in accordance with local, provincial and federal environmental regulations; and • Consult with environmental authorities during final disposal.

ACETYLENE and PROPANE

CONSIDER ACTION ONLY IF SAFETY PERMITS! ELIMINATE IGNITION SOURCES, Keep vehicles away from accident area. If safe, stop the source of spill.

- Vaporous cannot be contained when released
- Water spray can be used to knock down vaporous if there is NO chance of ignition
- Personnel should withdraw immediately from area unless it is a small leak that has been stopped immediately after detection
- If tanks are damaged, gas should be allowed top disperse and no attempted recovery made
- Personnel should avoid touching release point on container since frost quickly forms
- Keep away from tank ends.

13 APPENDIX B1

Figure 13.1 Nunavut/NWT Spill Report Form

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR	REPORT NUMBER
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	____-_____
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS			

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

REPORT LINE USE ONLY

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

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

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

PAGE 1 OF _____

Schedule B2[1]

Reportable Spill Quantities

Item No.	TDGA Class	Description of Contaminant	Amount Spilled
1.	1	Explosives	Any amount
2.	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100[1].
3.	2.2	Compressed gas (no corrosive, non flammable)	Any amount of gas from containers with a capacity greater than 100[1].
4.	2.3	Compressed gas (toxic)	Any amount
5.	2.4	Compressed gas (corrosive)	Any amount
6.	3.1, 3.2, 3.3	Flammable liquid	100 l
7.	4.1	Flammable solid	25 kg
8.	4.2	Spontaneously combustible solids	25kg
9.	4.3	Water reactant solids	25 kg
10.	5.1	Oxidizing substances	50 l or 50 kg
11.	5.2	Organic Peroxides	1 l or 1 kg
12.	6.1	Poisonous substances	5 l or 5 kg
13.	6.2	Infectious substances	Any amount
14.	7	Radioactive	Any amount
15.	8	Corrosive substances	5 l or 5 kg
16.	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 l or 5 kg
17.	9.2	Environmentally hazardous	1 l or 1 kg
18.	9.3	Dangerous wastes	5 l or 5 kg
19.	9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 l or 0.5 kg
20.	None	Other contaminants	100 l or 100 kg

1 1
From: Consolidation of Regulation R-068-93 Spill Contingency Planning And Reporting Regulations (July 22 1993) Consolidation Issued July 15 1998

14 APPENDIX C

Contact Numbers (Note: key list of MHBL, KIA, government agencies, enforcement etc.)

Key Miramar Hope Bay Limited personnel responsible for the Implementation of this EPP

Name	Position	Address	Contact
Jim Currie	Vice President, Operation	Suite 300- 889 Harbourside Drive North Vancouver, BC V7P 3S1	Tel: 604-985-2572 Fax: 604-980-0731 Email:jcurrie@miramarmining.com
John Wakeford	Vice President, Exploration		Tel:604-985- 2572 Fax:604-980-0731 Email:jwakeford@miramarmining.com
Larry Connell	General Manager, Environment		Tel:604-985- 2572 Fax:604-980-0731 Email:lconnell@miramarmining.com
Terry Maloof	Manager, Environmental Audit & Permitting		Tel:604-985- 2572 Fax:604-980-0731 Email:tmaloof@miramarmining.com
Scott Stringer	General Manager, Northern Operations	Miramar Hope Bay Limited *(Contact during height of exploration programs. Email is the preferred method for external communication due communication difficulties experienced at times out in field).*	Tel:867-766-5311 Fax:867-873-6357 Email:sstringer@miramaryk.com
Matthew Kawei	Snr Environmental Coord; – MHBL		Tel:867-766-5321 Fax:867-873-6357 Email:mkawei@miramarmining.com
Darren Lindsay	Exploration Manager – Hope Bay Belt		Tel:1-800-663-8780 Fax: Radio Channel: 1 & Channel Email:dlindsay@miramarmining.com
Ross Sherlock	Snr Research Geologist – Regional Exploration		Tel:1-604-677-0617 Fax: Radio Channel: 1 & Channel 2 Email:rsherlock@miramarmining.com
Mike Cripps	Site Supervisor		Tel: Fax: Radio Channel: 1 & Channel 2 Email:mcripps@miramarmining.com Tel:

Key Government personnel responsible for activities relating MHBL Exploration programs

Name	Position	Address	Contact
Spill Center	NWT 24 hours Spill Report Line	Yellowknife, NT	Tel:867-920-8130 Fax:867-873-6924
Philippe di Pizzo	Executive Director, Nunavut Water Board (NWB)	Iqualuit, Nunavut	Tel:867-360-6338 Fax:867-360-3669 Email:
DIAND	Water Resource Inspector	Iqualuit, Nunavut	Tel:867-975-4546 Fax: Email:
Jack Kaniak	Lands Manager, Kitikmeot Inuit Association (KIA)	Kugluktuk, Nunavut	Tel:867-928-3310 Fax:867-982-3311 Email:jkaniak@polarnet.ca
Colette Meloche	Environment Canada (EC)	Iqualuit, Nunavut	Tel:867-975-4639 Fax: Email:Colette.meloche@ec.gc.ca
Tania Gordanier	Department of Fisheries & Oceans (DFO)	Iqualuit, Nunavut	Tel:867-979-8007 Fax:867-989-8039 Email:gordaniert@dfo-mpo.gc.ca