# ATTACHMENT 1 EKA PRO.2104 SPILL CONTINGENCY PLAN



# EKA PRO.2104 Spill Contingency Plan

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Change Requests:	Jamie Steele – Environment Advisor-Compliance
Brief Description:	This plan ensures immediate and effective handling of a major environmental emergency, and minimizes danger to personnel, property, and the environment.

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# 1.0 Corporate Statement

This Spill Contingency Plan for EKATI has been developed in keeping with BHPB's Guiding Principles, the corporate HSEC Policy and with a high regard for the safety and wellbeing of all staff and the general public.

It is BHPB's policy to achieve and maintain a high standard of environmental performance in conducting its activities. BHPB seeks to minimize the environmental impacts of its operations by ensuring that procedures, practices and resources are consistent with its policy objectives.

# 2.0 Intent and Scope

#### Intent

This Spill Contingency Plan (Plan) was developed to establish and document practices for responsible management of controlled substance spills at the EKATI Diamond Mine (EKATI); to encourage consistent approaches; and to promote improved response capability. The Plan is underpinned by BHP Billiton Canada Inc.'s (BBCI) Health, Safety, Environment & Community (HSEC) Policy and minimum standards set by regulatory requirements. Guiding the development and implementation of the Plan has been the principle that an effective and high-quality Spill Contingency Plan must provide:

- 1. A clear chain of command for all spill-related emergency activities.
- 2. Accountability for the performance of the spill response.
- 3. Well-defined expectations regarding spill response and subsequent clean-up programs.
- 4. Well-defined task and operational hazards/risk.
- 5. Comprehensive hazard prevention and control methods.
- 6. Reporting and record keeping requirements to track program progress.

This Spill Contingency Plan has been developed with EKATI and area-specific hazardous/risk analysis in mind. It outlines the necessary resources, personnel, logistics and initial actions to facilitate a prompt, coordinated and rational approach to emergency incidents. This Spill Contingency Plan also contains sufficient detail to enable those who are involved to respond effectively. Each person within the facility must know their role as well as the roles of those with whom they will interact.

#### <u>Scope</u>

This Plan has been prepared to address emergency incidents that may occur at EKATI and it identifies actions and measures to be taken in the event of a spill at any of the EKATI operating sites. This plan does not cover the transportation activities along the Winter Road. A separate plan exists to address spills and contingency planning along the Winter Road from Tibbitt Lake to Contwoyto Lake (Tibbitt to Contwoyto Winter Road Joint Venture Spill Plan). Surface mining activities at EKATI are currently underway at Fox Pit. Underground mining is currently underway at the Koala and Koala North Pipes. Activity is currently underway at Misery pit to prepare to resume mining activities. Drilling operations are being conducted at the Misery Pit location.

# **3.0 Application – Who this applies to**

This plan applies to all BHP Billiton Employees and Contractors working for BHP Billiton Canada Inc. at the EKATI Diamond Mine.

# 4.0 Regulatory Framework

This Plan has been developed to satisfy the following requirements:

- Class A Water License W2009L2-0001
- Environmental Agreement (clause 6.1)
- NWT Environmental Protection Act
- NWT Guidelines for Spill and General Contingency Plans
- NWT Spill Contingency Planning and Reporting Regulations
- NWT Mine Health and Safety Act and Regulations
- National Fire Code of Canada
- Canadian Environmental Protection Act (CEPA 1999) Environmental Emergency Regulations
- Canadian Environmental Protection Act (CEPA 1999) Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations
- ISO 14001 Emergency Preparedness and Response

Several federal and territorial government agencies are responsible for enforcement of the above requirements, and provide oversight of spill clean-up and reporting.

#### Wek'eezhii Land and Water Board (WLWB)

The WLWB issues water licenses and land use permits in accordance with the Mackenzie Valley Resource Management Act and the Northwest Territories Waters Act. Conditions of these licenses and permits include authorized limits for water use, sources of water used, effluent discharge limits, and monitoring and reporting requirements. These licenses require spill contingency plans be submitted for approval and reviewed and revised annually.

#### Government of Canada

#### Department of Indian Affairs and Northern Development (DIAND)

Enforcement of the provisions of the water licences is carried out through the Operations Directorate of DIAND by Resource Management Officers. Reported spills are routinely

inspected by the DIAND Inspector. Spill reports are officially closed by the DIAND Inspector, when the Inspector is satisfied with the clean-up and mitigation activities.

#### **Environment Canada (EC)**

The Environmental Protection Branch (EPB) of Environment Canada administers the Canadian Environmental Protection Act (CEPA, 1999) and Section 36 of the Fisheries Act. Regulations enacted under CEPA, 1999 require Environmental Emergency (E2) Plans and notifications. Inspectors for Environment Canada occasionally visit spill sites to investigate.

A cross reference to the requirements of CEPA 1999 Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations can be found in Appendix 4.

#### Fisheries and Oceans Canada (DFO)

Fisheries and Oceans Canada (DFO) administers the habitat protection provisions of the Fisheries Act. This includes prohibiting the blocking of fish passageways and the destruction of fish habitat. On occasion, DFO Inspectors visit spill sites to investigate possible impacts to fish habitat.

#### Government of Northwest Territories (GNWT)

#### Department of Environment and Natural Resources (ENR)

The Environmental Protection Division of ENR is responsible for the Environmental Protection Act (EPA) and the Spill Contingency Planning and Reporting Regulations for the NWT. These regulations require:

- a contingency plan be prepared and filed for facilities where petroleum, chemicals and other contaminants are stored; and
- the reporting of spills.

Inspectors appointed under the CEPA can issue clean-up orders for spills and other environmental incidents occurring on Commissioner's Land within NWT.

#### Workers Safety and Compensation Commission (WSCC)

The Prevention Division of the WSCC is responsible for enforcement of the NWT Mine Health and Safety Act and Regulations, which include the provision for the establishment of an Emergency Response Team to address site emergencies such as spills.

The WCB also enforces compliance with technical safety legislation such as the Work Site Hazardous Materials Information System (WHMIS). WHMIS mandates the use of material safety data sheets (MSDS) that outline specific storage and handling requirements for process chemicals. MSDS documents form a component of this Plan.

#### **Department of Transportation**

The NWT Department of Transportation, Motor Vehicles Division, is responsible for administering the Transportation of Dangerous Goods Act and Regulations (NWT). The

Department is also responsible for driver, vehicle and load safety under additional transport legislation.

#### Department of Municipal and Community Affairs, Territorial Fire Marshall

The operation of bulk fuel storage and handling facilities at EKATI must meet the National Fire Code of Canada (NFCC) regulations under the Fire Prevention Act of the Northwest Territories. The Fire Prevention Act adopts the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (2003).

#### **National Fire Code**

Section 4.1.5.6 "Emergency Planning" and Section 4.1.6.3 "Spills and Leaks" of the Code requires that emergency planning measures shall be provided for areas where flammable liquids or combustible liquids are stored. The Code also requires that maintenance and operating procedures be established to minimize potential impacts of spills and leaks of flammable or combustible liquids.

In compliance with its regulatory and ISO 14001 obligations, BHPB commits to reviewing and revising the Plan annually, or more frequently if there are changes of a material nature. In the event of a material change to the Plan, it will be submitted for approval as per our regulatory requirements. However, BHPB reserves the right to update certain portions of the Plan as and when operational changes necessitate, without the need for WLWB approval. The scope of these updates shall include contact lists, roles and responsibilities, SOPs, and MSDS's and format changes.

# 5.0 Ekati Spill Contingency Plan

The main objectives of this plan are to:

- 1. Ensure immediate and effective handling of any emergency
- 2. Minimize danger to the public and all personnel
- 3. Minimize impact on the local and surrounding environment
- 4. Minimize loss of property and production
- 5. Facilitate and ensure effective communication to all parties impacted by or involved in response to and emergency.

# 5.1 Facility Description

EKATI is located at Latitude 64°, 42 minutes, Longitude 110°, 37 minutes, and approximately 300 kms northeast of Yellowknife. Access to the site is by winter road or aircraft. The facility was commissioned in October 1998. Site location and the access roads are shown on Figure 1.

The main site includes an accommodation building that can house 700 people at a time, a central processing facility, a 26.4 MW power plant, ore crushing and storage facility, explosives manufacturing plant, maintenance garage, truck shop, and a fuel tank farm. In addition to the main camp, the Misery camp is located 29 kms southwest of the site. Misery has a bulk diesel storage facility. Currently Misery camp is being prepared to resume mining activities with the installation of new camp infrastructure. The layout of the EKATI main camp, and the Misery camp are shown in Figure 2.

EKATI has 76 hydrocarbon storage tanks in 3 tank farms and various auxiliary above ground storage tanks with a storage capacity of approximately 100 million litres. Details and characteristics of these storage tanks and locations can be found in Table 1 and figures 3 through 8. Information about the location and annual quantity of other potentially hazardous materials that are stored and utilized at EKATI are provided in Table 2.

#### Figure 1 - Location of the EKATI Diamond Mine



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#### Figure 2 - EKATI Site Map with Misery Inset

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#### Figure 8 - Aerial Photo – Misery Camp



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**EKATI Diamond Mine** 2009 Satellite Imagery



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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
TK-1	519340	7175536	Helipad Aviation	Jet A-1	50000	STREAM	-53	220	Double Wall Tank
TK-2	519340	7175536	Helipad Aviation	Jet A-1	50000	STREAM	-53	220	Double Wall Tank
TK-3	519340	7175536	Helipad Aviation	Jet A-1	50000	STREAM	-53	220	Double Wall Tank
TK-4	519340	7175536	Helipad Aviation	Jet A-1	50000	STREAM	-53	220	Double Wall Tank
ТК-5	518523	7175708	Airport Aviation Tank	Jet A-1	14858	LAKE	-126	84	Double Wall Tank, Earthen Dike, Liner
53-TK- 921	518064	7176544	Main Camp Powerhouse Day Tank	Engine Oil	15000	LAKE	-143	306	Single Wall Tank, Concrete Walls & Floor
53-TK- 922	518064	7176544	Main Camp Powerhouse Day Tank	Used Oil	6000	LAKE	-143	306	Single Wall Tank, Concrete Walls & Floor
53-TK- 961	518064	7176544	Main Camp Powerhouse Day Tank	Glycol	6000	LAKE	-143	306	Single Wall Tank, Concrete Walls & Floor
53-TK- 962	518064	7176544	Main Camp Powerhouse Day Tank	Glycol	6000	LAKE	-143	306	Single Wall Tank, Concrete Walls & Floor

### Table 1 - Fuel and Lubricants Bulk Storage Locations and Characteristics

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
53-TK- 963	518064	7176544	Main Camp Powerhouse Day Tank	Glycol	6000	LAKE	-143	306	Single Wall Tank, Concrete Walls & Floor
53-TK- 964	518044	7176571	Main Camp Powerhouse Propylene Bulk Tank	Propylene Glycol	30000	LAKE	-140	308	Single Wall Tank, Concrete Walls & Floor
54-TK- 001	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	3992817	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 002	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	3994213	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 003	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	10192171	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 004	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	10198592	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 005	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	10193092	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 006	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	10199451	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
54-TK- 006	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	10199451	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 007	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	9551080	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 008	518257	7176540	Ekati Main Camp Bulk Fuel Storage	Diesel	9552468	STREAM	-34	332	Single Wall Tank, Earthen Dike, Liner
54-TK- 009	539571	7160997	Misery Camp Bulk Fuel Storage	Diesel	9547457	LAKE	126	165	Single Wall Tank, Earthen Dike, Liner
54-TK- 010	514144	7172434	Fox Bulk Fuel Storage	Diesel	9549589	LAKE	-61	438	Single Wall Tank, Earthen Dike, Liner
54-TK- 011	514144	7172434	Fox Bulk Fuel Storage	Diesel	9558180	LAKE	-61	438	Single Wall Tank, Earthen Dike, Liner
54-TK- 012	519160	7177718	Koala North Bulk Fuel Storage Tank	Diesel	1039464	STREAM	-45	530	Single Wall Tank, Earthen Dike, Liner
54-TK- 019	517993	7176578	Process Plant Incinerator Day Tank	Diesel	9000	LAKE	-132	275	Double Wall Tank

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
54-TK- 029	518048	7176482	Emergency Generators Day Tank	Diesel	35000	LAKE	-152	259	Double Wall Tank
54-TK- 043	518003	7176355	Main Camp Boiler Diesel Day Tank	Diesel	35000	STREAM	-132	159	Double Wall Tank
54-TK- 051	518254	7176302	Main Camp Incinerator Bulk Tank	Diesel	9000	LAKE	-88	142	Double Wall Tank, Earth Dike
54-TK- 054	518093	7176985	Koala Mine Haul Day Tank	Diesel	54900	STREAM	-2	441	Double Wall Tank, Earth Dike
54-TK- 055	518093	7176985	Koala Mine Haul Day Tank	Diesel	54900	STREAM	-2	441	Double Wall Tank, Earth Dike
54-TK- 056	518207	7176709	Warming Shed Day Tank	Diesel	9000	STREAM	38	417	Double Wall Tank, Earth Dike
54-TK- 057	518258	7176560	Main Camp Light Vehicle Day Tank	Diesel	35000	STREAM	-36	344	Double Wall Tank
54-TK- 058	518585	7175857	Airport Emergency Gen Set Day Tank	Diesel	5000	STREAM	11	63	Double Wall Tank
54-TK- 301	518011	7176770	Lube Facility Bulk Tank	Diesel	4500	LAKE	-117	445	Double Wall Tank, Steel Dike
54-TK- 601	516389	7176454	Emulsion Plant Polar Explosives Day Tank	Diesel	22000	STREAM	93	123	Double Wall Tank
54-TK- 702	539683	7160934	Misery Camp Shop Generator Fuel Storage	Diesel	4500	LAKE	105	260	Double Wall Tank, Metal Berm
54-TK- 703	539683	7160934	Misery Camp Shop Furnaces Storage	Used Oil	4550	LAKE	105	260	Double Wall Tank

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
54-TK- 703	539683	7160934	Misery Camp Shop Furnaces Storage	Used Oil	4550	LAKE	105	260	Double Wall Tank
54-TK- 704	539571	7160997	Misery Fuel Dispensing Day Tank	Diesel	25000	LAKE	126	165	Double Wall Tank, Earthen Dike, Liner
54-TK- 804	514144	7172434	Fox Fuel Dispensing Day Tank	Diesel	25000	LAKE	-61	438	Double Wall Tank, Earthen Dike, Liner
54-TK- 901	518045	7176571	Main Camp Powerhouse Day Tank	Diesel	47500	LAKE	-140	308	Double Wall Tank
54-TK- 902	518045	7176571	Main Camp Powerhouse Day Tank	Diesel	47500	LAKE	-140	308	Double Wall Tank
54-TK- 911	519160	7177718	Koala North Fuel Dispensing Day Tank	Diesel	10000	STREAM	-45	530	Double Wall Tank, Earthen Dike, Liner
58-TK- 101	518306	7176659	Waste Management / Water Separator Tank	Used Oil	2200	STREAM	-31	364	Double Wall Tank, Concrete Walls & Floor
58-TK- 102	518306	7176659	Waste Management Bulk Tank	Used Oil	2200	STREAM	-31	364	Double Wall Tank, Concrete Walls & Floor
58-TK- 203	518681	7177309	Koala Heat Recovery Bulk Tank	Glycol	30000	STREAM	-113	370	Double Wall Tank, Earthen Dike

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
58-TK- 203	518681	7177309	Koala Heat Recovery Bulk Tank	Glycol	30000	STREAM	-113	370	Double Wall Tank, Earthen Dike
59-TK- 010	518005	7176749	Lube Facility Bulk Tank	Used Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 011	518005	7176749	Lube Facility Bulk Tank	Used Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 012	518005	7176749	Lube Facility Bulk Tank	Engine Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 013	517982	7176752	Lube Facility Waste Bulk Storage Tank	Glycol	306000	LAKE	-115	416	Single Wall Tank, Concrete Walls & Floor
59-TK- 014	517982	7176752	Lube Facility HD Antifreeze 60/40 Premix Bulk Tank	HD Antifreeze 60/40 Premix	306000	LAKE	-115	416	Single Wall Tank, Concrete Walls & Floor
59-TK- 015	518005	7176749	Lube Facility Bulk Tank	Engine Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 016	518005	7176749	Lube Facility Trans Extra Bulk Tank	Hydraulic Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
59-TK- 016	518005	7176749	Lube Facility Trans Extra Bulk Tank	Hydraulic Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 017	518005	7176749	Lube Facility Trans Extra Bulk Tank	Hydraulic Oil	306000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 018	518005	7176749	Lube Facility Trans 30 Bulk Tank	Transmission Oil	100000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 019	518005	7176749	Lube Facility Trans 30 Bulk Tank	Transmission Oil	100000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 020	518005	7176749	Lube Facility Trans 50 Differential Bulk Tank	Gear Oil	100000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
59-TK- 021	518005	7176749	Lube Facility Trans 30 Bulk Tank	Transmission Oil	100000	LAKE	-118	424	Single Wall Tank, Concrete Walls & Floor
61-TK- 044	518059	7176676	Truck Shop Day Tank	Engine Oil	30000	LAKE	-130	393	Single Wall Tank, Concrete Walls & Floor

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
61-TK- 045	518059	7176676	Truck Shop Trans 30 Day Tank	Transmission Oil	30000	LAKE	-130	393	Single Wall Tank, Concrete Walls & Floor
61-TK- 047	518059	7176676	Truck Shop Trans 50 Differential Day Tank	Gear Oil	30000	LAKE	-130	393	Single Wall Tank, Concrete Walls & Floor
61-TK- 048	518059	7176676	Truck Shop Day Tank	Hydraulic Oil	30000	LAKE	-130	393	Single Wall Tank, Concrete Walls & Floor
61-TK- 049	518059	7176676	Truck Shop Day Tank	Hydraulic Oil	30000	LAKE	-130	393	Single Wall Tank, Concrete Walls & Floor
63-TK- 229	515583	7177301	Incinerator Plant Bulk Tank	Diesel	2200	LAKE	139	270	Double Wall Tank, Concrete Walls & Floor
63-TK- 230	515583	7177301	Incinerator Plant Bulk Tank	Diesel	15000	LAKE	139	270	Double Wall Tank, Earthen Dike, Liner
245-TK- 01	519303	7177924	FAR Panda No.1 Day Tank	Diesel	25000	STREAM	-68	623	Double Wall Tank, Earthen Dike, Liner
245-TK- 02	519303	7177924	FAR Panda No.1 Day Tank	Diesel	50000	STREAM	-68	623	Double Wall Tank, Earthen Dike, Liner

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
245-TK- 02	519303	7177924	FAR Panda No.1 Day Tank	Diesel	50000	STREAM	-68	623	Double Wall Tank, Earthen Dike, Liner
245-TK- 03	519303	7177924	FAR Panda No.1 Day Tank	Diesel	25000	STREAM	-68	623	Double Wall Tank, Earthen Dike, Liner
245-TK- 04	519303	7177924	FAR Panda No.1 Bulk Tank	Used Oil	50000	STREAM	-68	623	Double Wall Tank, Earthen Dike, Liner
245-TK- 05	519531	7178222	FAR Panda No. 3 Day Tank	Diesel	25000	STREAM	40	296	Double Wall Tank, Earthen Dike, Liner
245-TK- 06	519531	7178222	FAR Panda No. 3 Day Tank	Diesel	50000	STREAM	40	296	Double Wall Tank, Earthen Dike, Liner
245-TK- 07	518878	7177271	FAR Koala No. 1 Day Tank	Diesel	25000	STREAM	-139	458	Double Wall Tank, Earthen Dike, Liner
245-TK- 08	518878	7177271	FAR Koala No. 1 Bulk Tank	Diesel	50000	STREAM	-139	458	Double Wall Tank, Earthen Dike, Liner
245-TK- 09	518719	7177307	FAR Koala No. 2 Day Tank	Diesel	25000	STREAM	-119	385	Double Wall Tank, Earthen Dike, Liner

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Tank ID	UTM x	UTM y	Description/Location	Substance	Capacity (L)	Nearest Environmental Feature	Bearing	Distance from Feature (m)	Secondary Containment
245-TK- 09	518719	7177307	FAR Koala No. 2 Day Tank	Diesel	25000	STREAM	-119	385	Double Wall Tank, Earthen Dike, Liner
245-TK- 10	518719	7177307	FAR Koala No. 2 Bulk Tank	Diesel	50000	STREAM	-119	385	Double Wall Tank, Earthen Dike, Liner
265-TK- 001	519030	7177527	Underground Batch Plant Bulk Tank	Diesel	35000	STREAM	-20	538	Double Wall Tank, Concrete Dike
266-TK- 001	518951	7177631	Koala North Office Dry Building Bulk Tank	Diesel	8620	STREAM	-26	652	Double Wall Tank, Concrete Dike
267-TK- 201	519058	7177680	Koala North Boiler Bulk Tank	Diesel	24315	STREAM	-35	584	Double Wall Tank, Concrete Dike

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Storage Location	Material	Quantity (kg)	Purpose
AN building	Ammonium nitrate	14,500,000	Explosive agent
Sea cans at Emulsion Plant	Emulsifier - N23	56,000	Polymer
Sea cans at Emulsion Plant	Emulsifier - N7	60,000	Polymer
Sea cans at Emulsion Plant	Sodium Nitrate	8,000	"Lightening" Product for Explosives
Sea cans at Emulsion Plant	Glacial Acetic Acid	47,000	Controls speed of lightening
Sea can at Emulsion Plant	Nitric Acid	364	pH adjustment
Sea can at Emulsion Plant	Fuel dye for ANFO	412	Colourant
Sea can at Emulsion Plant	Sodium Thiocyanate	24,000	"Lightening" product for explosives
Sea can at Emulsion Plant	Soda Ash	94	pH adjustment
Sea can at Emulsion Plant	Sodium Formate	91	Emulsion agent
Truck Shop Laydown	Ethylene Glycol	26,300	Freeze protection
Small Diamonds Reagent Facility	Dry Conditioner	200,000	Small Diamonds Facility
Small Diamonds Reagent Facility	Liquid Collector	193,000	Small Diamonds Facility
Small Diamonds Reagent Facility	Flotation Frother	48,000	Small Diamonds Facility
Process Plant Storage Yard and Laydown 6	Ferrosilicon	4,072,000	Heavy Medium in HMS
Process Plant Storage Yard and Laydown 6	Magnafloc 156	630,400	Anionic flocculant
Process Plant Storage Yard	Magnafloc 368	198,400	Cationic coagulant

### Table 2 - Storage locations of Potentially Hazardous Material

# 5.2 Spill Prevention

Prevention of spills is the best option to protect the environment and preserve resources. Spill prevention or the minimization of spill-related emergencies at EKATI is based on a number of inter-related activities with a single overarching objective – spill prevention. These activities include the following:

# 5.2.1 Prevention Through People

EKATI implemented a strategic overarching prevention program. This strategy was created because people are our best resource. Corrective action can be identified through root cause analysis including people from various departments. PTP emphasizes the role of people in preventing spills and seeks cultural change across the organization.

All equipment and infrastructure is maintained by the Maintenance Department on site. Each area of this department has a preventative maintenance schedule set up to eliminate and reduce breakdowns.

Keeping people and the environment safe requires training, awareness, responsibility and cooperation among all parties.

# 5.2.2 Reliable Inventory Control and Reconciliation

Fuel offloading stations have been upgraded so accurate fuel reconciliation can be performed. The MIDCOM Fuel Reconciliation Program is upgraded to ensure accurate and standardized fuel use/inventory control with an independent company providing a certificate of accuracy for each meter used. Updates are performed on EKATI's fuel database to reflect all current information. The overall outcome of the technological update is a fuel management system that will provide real-time fuel inventory management with gross volume inventory, density, fuel temperature and net volume for each storage tank on the EKATI site.

# 5.2.3 Lube Oil Facility

With the intent of controlling unaccounted inventory deficiencies, the lube facility is locked. Only authorized employees have access to the facility. Tanks inside the truck shop are part of the total lube facility inventory for better reconciliation and oil management.

# 5.2.4 Inspection Programs

Regular inspections of work areas and storage tank and distribution systems provide early warnings of potential weaknesses. Inspections are performed daily, monthly and annually. A training program has been developed for personnel undertaking the inspections and a system of record keeping is in place.

### 5.2.5 Investigations and Continuous Improvement

It is recognized that even with the most effective prevention measures in place, incidents will occur. Investigations are undertaken following significant or recurring spills to identify the root cause and corrective actions that will prevent future incidents.

Investigations may take several paths including compliance auditing, risk reduction and/or training efficiency assessments.

The root cause analysis process is driven by BHP Billiton's "Incident, Cause, Analysis Method" (ICAM) using the MINICAM Investigations Guide. This is tracked once entered into First Priority System.

Investigation findings of significant incidents are used in a proactive manner to communicate learning's not only internally at EKATI but externally to the BHPB Corporate Significant Incident website for distribution to all BHPB sites.

# 5.3 Emergency Response Action Plan

To assist in the investigation of the cause of an incident and effectiveness of the company's response activities, each person involved in an incident should keep an accurate record of the events in which they are involved.

Where an immediate report is required under government regulations, only specific facts describing the emergency should be disclosed. No statement should be made that offers speculation as to the cause or blame since any report may be utilized in the event of litigation.

Responders dealing with environmental emergencies should keep accurate records as to what happened and corrective action taken. This is essential to facilitate long-term reclamation of the spill site as well as reporting.

Unlike other normal reporting procedures, when requested by federal or territorial agencies, all written reports and communication by EKATI personnel that relate to the incident should be prepared by authorized personnel in the Environment Department.

In the event of a Level 3 spill (see definition of Level 3 Emergency in this section of the Plan), where significant off-site impacts or impacts of sensitive environmental receptors are anticipated or if personal injury occurred, the Legal Department must review reports prior to external release.

# 5.3.1 General Preparedness

On a daily basis responsible facility personnel will check their assigned areas for:

- 1. Accumulation of combustible materials, rubbish or flammable liquids in excess of quantities allowed by normal operations.
- 2. Dangerous ignition sources such as warm extension cords, oily rags or heating equipment.
- 3. Signage identifying hazards associated with controlled products being in good order.
- 4. Adequate lighting in areas of fuel transfer.
- 5. Fire and exit doors and their self-closing hardware in good operating condition (doors should not be wedged under any conditions).
- 6. Ensure that exit routes are unobstructed and clearly identified.
- 7. Emergency shutdown controls unobstructed, clearly identified and operational.
- 8. Emergency and spill response procedures are up to date and posted prominently by storage facilities and/or transfer areas.
- 9. All pumps used for offloading or transfer operating properly with no excessive vibration, noise or overheating. No evidence of leaks.
- 10. Spill trays under equipment are clean and dry with no evidence of drips.
- 11. An adequate supply of spill absorbent on hand and accessible.
- 12. All tank isolation valves are chained and locked.
- 13. Ensure that keys to lock sites are accessible as necessary.

14. Technician performs daily inspections and fills out report "Daily Tankfarm Inspection Checklist". Reports are retained for review upon request.

### 5.3.2 Inventory of Response and Clean Up Equipment

Information about resources that are available for spill response at EKATI are grouped as follows:

- Spill Response Kits and ERT Spill Trailer Tables 3 and 4
- Mobile Equipment Table 5
- Protective Equipment Table 6
- Neighbouring Sites

<u>Spill Kits</u> – There are several spill kits available on site. Each work area should be equipped with a spill kit and extra spill kits can be purchased from the warehouse. The kits are packed inside marked yellow drums. Each kit contains personal protective equipment, spill containment materials and items specific to the location of the kit and the anticipated emergency. Spill Kit contents and warehouse stock numbers are listed in Table 4.

In addition to the spill kits, the EKATI mine site has a Spill Response Trailer located at the ERT fire hall that contains a large inventory of equipment and materials listed in Table 3.

### Table 3 - Inventory of ERT Spill Trailer

Item	Amount	Item	Amount	
Copy of Spill Contingency Plan	1	20' x 30' poly tarps	2	
Pop up Pools	3	Sets of folding warning triangles	3	
Oil selective spill pads (100 per pkg.)	3 pkg.	Bundle of pickets	1	
Absorbent material, 150 ft	1 roll	Spool of 1/2" poly yellow rope (335 ft)	1	
Plastic 10 x 14 foot tarps	3	Husqvarna 394 XP Chainsaw	1	
Gas Powered Generator	1	Rubbermaid Container #1		
Bags of Industrial Absorbent Material	4	Splash resistant goggles	4	
10' absorbent socks	5	Respirators ½ facemasks	5	
10,000 litre Porta Tank	1	Respirators cartridges combination type	1	
Gas Powered Ice Auger	1	XXXL Tyvek suits	1	
Ice Auger Bit	1	Neoprene gloves	1	
Pieces of 2 1/2" suction hose (20 ft ea)	2	Rubbermaid Container #2		
500 Watts Halogen light with stand	1	Tool kit, 107 pieces	1	
Roll of 6 mil. Poly (10'x100')	1	500W Halogen lights	1	
Shovels	4	Rubbermaid Container #3		
Ice Chippers	2	Flashlights	2	
Straw Brooms	2	D' cell batteries	2	
2' Rubber hose (100 ft length)	1	Large plastic bags	1	
Spare Broom Handles	2	Barricade Caution tape	2	
5 gallon pails	3	Flares	3	
Milk Crates	3	Orange flagging	3	
Fire Extinguisher, ABC, 20 Lbs.	1	#2 NWT first aid kit	1	
XL Rain Suits	4	Outside Front Cage		
Extension Cord (15m)	1	- traffic cones	8	
Bungee Cords	15	- tiger torch and propane cylinder	1	
Rubber Boots, size 10	4	- 5 gallon jerry cans and gas	2	
Rolls Duct Tape	12	- spare tire	1	
The truckshop warehouse is stocked with spill response materials. These material can be used to provide extra resources during a spill and to re-stock the spill kits. Warehouse items are listed in Table 4.

### Table 4 - Spill Kit Contents

Item	GSAP Number
45 Gallon Emergency Spill Kit Drum	60232340
Spill Pool	60183350
White hydrocarbon absorbent pad	60179534
White glycol absorbent pad	60181723
Tyvek coveralls	60180583
Protective Goggles	60183846
Nitrile Gloves	60183083
Dust Masks	60184440
Garbage Bags	60183118
Large Spill Booms (water)	60181224
Small Spill Booms	60181989
Sphag Sorb (dry floor absorb)	60179537
Sphag Sorb (4 cu. ft.)	60181458

<u>Mobile Equipment</u> – Mobile Equipment can be used during a spill response to create earth berms and diversion trenches. Mobile equipment is also used during spill cleanup and remediation. Table

## Table 5 - Mobile Equipment

Production Support Services	Production Support Services	Mine Operations	
426 Backhoe	Low Bed Truck Float	Light Vehicles	
Excavators	Truck Freightliner	Cat Tow Truck	
D-300 Articulated Dump Truck	Hydro-vac Truck	777 Water Truck	
Production Loaders	Genie Lifts		
Track Dozers	Misc. Hoses and Piping	Kingland Ford	
Graders		Forklifts	
Cranes	Mine Operations	Compressors	
Small Wheel Loaders	Excavators	Generators	
Buses	Cat 777 Trucks	10 ton Bucket Truck	
Trailers	Cat 789 Trucks	Welding Trucks	
Generators	Cat 793 Trucks	Bobcats	
Water Pumps	Production Loaders		
Light Vehicles	Track Dozers	Emergency Response Team	
Scissor Lifts	Graders	Fire Truck	
10 ton Hiab L9000 Truck	Wheel Dozers	Mobile Spill Response Unit	
Flat Deck	Small Wheel Loaders		
Roll Off Trucks	Buses	Environment Department	
Fuel Truck	Light Plants	Small Boats and Motors	

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Personal Protective Equipment – Safety and protective equipment are available from inventory at EKATI and are the responsibility of the Safety Team Leader. These Items are summarized in Table 6.

#### **Table 6 - Personal Protective Equipment**

Item
Self Contained Breathing Apparatus (SCBA)
(open and closed circuit)
1 hr SCBA Air Tank (Spare)
Explosive Meter
Electronic Gas Detector
Multi Gas Detector
Air Lifting bags
Dry suits
Compressors
Class A and Class B Foam
First Aid Kits
Rain Suits
Steel toe rubber boots
Tyvek Suits
Nitrile Gloves

<u>Neighboring Sites</u> – In the event if a major spill requiring additional resources, equipment and manpower will be made available through mutual aid agreements with the Diavik Diamond Mine, the Snap Lake Diamond Mine, and local fuel suppliers.

## 5.3.3 Response Organization

The primary responsibility for responding to an environmental emergency or spill event resides with the department that has ownership or is in control of the substance prior to an uncontrolled release.

The department's team leader's have a responsibility to conduct an initial hazard assessment of the spill site, determine the appropriate level that will drive the response, determine the need for additional specialized support and/or advice, and to activate the Plan.

A process map showing the spill response flow plan is shown in Figure 9. Hazard assessment will identify inherent and potential hazards that may be encountered as a result of the spill and risk associated with response activities to the spill.

<u>Key</u> Personnel – The procedure followed in this Plan is that the number of key personnel shall be kept to a minimum. However, the key personnel responsibilities must be assigned and accounted for in every emergency situation. A list of key EKATI Response Contacts are presented in Tables 7, 8 and 9.

## Table 7 - Key EKATI Response Contacts

Contact	Phone Number
EKATI Emergency Telephone	880-4444
EKATI 24-Hour General Security	880-2201
Environment Team Leader	880-2157 / Security (evenings)
Environment Superintendent–Operations	880-2232 (cell 1-867-444-9438)
Health and Safety – Superintendent	880-2305
Camp Services – Team Leader	880-2012
Mobile Maintenance – Superintendent	880-2098
Mine Operations – Superintendent	880-2247
Maintenance Services – Team Leader	880-2253
Process Plant – Team Leader	880-2043
Process Plant Maintenance – Team Leader	880-2081
General Manager	880-2133 (cell 1-867-445-1522)
Head of HSEC	880-6156 (cell 1-867-445-2386)

## Table 8 - Key Contractor Response Contacts

Contact	Phone Number
Finning – Service Operations Manager	880-2121
Kingland Ford – Manager	880-2178
Polar Explosives – Supervisor	880-4613
Tli-Cho Domco Ltd Manager	880-2428
Hydrocarbon Services	880-2140

## **Table 9 - External Contacts**

Contact	Phone Number
24-Hour Spill Report Line	(867) 920-8130
NWT Environment and Natural Resources	(867) 873-7181
Workers' Compensation Board	(867) 920-6134
NWT Fire Marshal	(867) 873-7469
RCMP – Yellowknife	(867) 669-1111
Aboriginal Affairs and Northern Development Canada	(867) 669-2760
Wek'eezhii Land and Water Board (WLWB)	(867) 766-7457
DIAND Water Resources Division	(867) 669-2650
Environment Canada, Environmental Protection	(867) 669-4728
Fisheries and Oceans Canada (DFO)	(867) 669-4900
CANUTEC	(613) 996-6666 (call collect)

## 5.3.4 Emergency Levels

## Level 1 Emergency

No immediate hazard to the environment or human health and the situation is localized to a specific area of the site.

Conditions

- 1. Small spill contained and controllable.
- 2. An unexpected release of hydrocarbon vapors has been confined with hazardous concentrations localized to a specific area of the site.
- 3. A hydrocarbon/chemical spill or leak requiring immediate reporting to regulatory authorities and which is confined to an area of the site and having a minimum potential threat to the environment.
- 4. The spill can be managed with resources immediately available on site by the responsible department.

## Level 2 Emergency

This spill is localized within the broader site area. Realistic and potential hazard to the environment or human health exists but is not yet being experienced.

## Conditions

- 1. A significant uncontrolled discharge of a controlled product has occurred with impacts contained within the facility site.
- 2. An unexpected release of hydrocarbon vapors is present and is impacting other areas of the site.
- 3. A significant hydrocarbon/chemical spill or leak has occurred with more widespread site impacts causing a hazard to on-site personnel and/or a realistic potential off-site hazard to the public or the environment.
- 4. The responsible department may not have adequate resources immediately and readily available to adequately respond to the incident.

## Level 3 Emergency

The situation has resulted in serious impacts outside of the facility site area and serious hazard to off-site and/or sensitive environmental receptors exist.

#### Conditions

- 1. A major uncontrolled release of a controlled substance has occurred causing threat to facility personnel, operations, or the natural environment.
- 2. An unexpected release of hydrocarbon vapours has occurred with serious impacts being experienced outside of the facility site.
- 3. A major hydrocarbon/chemical spill or leak has occurred with hazardous impacts being experienced outside the facility site.
- 4. A hydrocarbon/chemical spill or leak has occurred with potential impact on sensitive environmental receptors such as a natural watercourse.



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## 5.3.5 Responsibilities

## **Actions**

The following list responses by position (responsibilities are assigned to individuals or their designates) for each emergency stage.

## Facility Attendant / First on the Scene

Levels 1, 2 and 3

- Assess the situation.
- Turn off master control, activate emergency shut-down switch or shut down individual pumps as appropriate. Shut down electrical main switch (breaker) and/or fuel supply line.
- Ensure safety of people in the immediate area.
- Remove unnecessary personnel from the immediate area as necessary.
- Notify team leader.
- If unable to contact team leader, notify alternate.
- Contact emergency services as required.

Note: Security and the Environment Department must be notified in situations involving large spills or small amounts if hazardous conditions exist or if potential impact to sensitive environmental receptors can be anticipated (Level 3). Initiate Code One.

- If spill occurs during fuelling of a vehicle, do not remove nozzle from vehicle.
- If the incident involves the leakage of compressed gasses such as propane, evacuate area immediately and initiate Code One.

## Team Leader (Responsible Department) or Alternate

## Level 1

- Assess the situation.
- Declare severity level.
- Confirm that sufficient equipment and resources are available to response to spill incident.
- Initiate action as specified in SOP specific for the substance provided in Appendix A of this Plan and available on EKATI Intranet system.
- Confirm safety of all personnel on-site.
- Request systems from specialized corporate services as required.
- Document circumstances of spill event and actions initiated.
- Ensure notification of Environment Department as soon as practical.

## Level 2

All of the above plus:

- Proceed to scene as necessary.
- Contact Environment Department representative.

- Ensure area has been evacuated if required.
- Ensure monitoring of hazardous concentrations of materials in immediate site area is initiated as appropriate.
- Ensure that the operations of the facility are secure.
- Establish on-scene command post as required.
- Contact Mine Services for additional resources as necessary.
- In consultation with the Environment Department, develop site-specific strategy to minimize the impact of the spill.
- Initiate clean up / remediation activities.

#### Level 3

All the above plus:

- Initiate Code One.
- Proceed to scene.
- In consultation with the Emergency Response Team Coordinator, assume role as on-scene commander.
- Identify exclusion zone.
- Initiate clean-up / remedial action.

## **Environment Department**

The role and responsibility of the Environment Department is that of scientific authority and specialist advisor to the responsible department team leader, the on-site commander or the Emergency Response Team Coordinator.

The Environment Department is also responsible for all communications and reporting functions to regulatory agencies.

Level 1

- Receive and analyze spill reports from responsible department and report to regulatory agencies.
- Provide advice, support relating to clean-up/remediation activities as appropriate.
- Verify remediation results and report as appropriate.

#### Level 2

All the above plus:

- Establish and maintain contact with responsible department team leader.
- Assist with the evaluation of the situation in conjunction with the responsible department team leader and declare/confirm severity level of spill.
- Give technical advice and support to responsible team leader as requested.

#### Level 3

All the above plus:

- Respond to Code One, as requested by ERT.
- Confirm nature and extent of environmental contamination.

- Proceed to scene to assist with situation assessment.
- Develop and initiate monitoring strategy for hazardous conditions.
- Maintain a record of all monitoring results.
- In consultation with the Emergency Response Team Coordinator, assist with development and implementation of contaminant and site specific spill control measures.
- Provide technical assistance and advice to on-scene commander regarding remediation strategy.
- Monitor and report attainment of remediation objectives.

## Mine Services

The primary responsibility of Mine Services is to provide equipment and manpower to assist the responsible department team leader or the on-scene commander in the control of a spill and subsequent remediation activities.

Mine Services will work under the direction of the responsible department team leader (Level 1 and Level 2 emergencies) or the on-site commander (Level 3 emergencies).

## Level 1

Stand by and provide assistance as requested.

## Level 2

All the above plus:

- Provide specialized equipment and manpower to control spill.
- Under the direction of the responsible department team leader, provide equipment and services to facilitate effective site remediation.

## Level 3

All the above plus:

- Respond to Code One, as requested by ERT.
- Proceed to the scene to assist with construction activities and maintenance activities as required.
- Alert/mobilize equipment and personnel as appropriate.
- In consultation with the ERT Coordinator, ensure utilities are shut off as may be required.
- Coordinate, procurement, staging and other logistics requirements, if needed.
- Provide equipment and manpower resources for remedial activities.
- Assist with the investigation and response assessment, and provide input to plan improvement as appropriate.

## Safety & Security Department

The primary responsibility of the Health and Safety Department is to provide professional advice and on-scene command in the event of a significant spill event. If ongoing safety concerns or hazards exist on-site, the ERT Coordinator will ensure the area is secure as necessary (e.g., ignition source is eliminated, area access restricted, etc.), ensure all the response personnel on-site are wearing appropriate personal protection equipment as required, determine the need for additional safety manpower or equipment on-site (e.g., breathing apparatus, explosive vapour / chemical monitors, fire equipment, medical supplies), determine the need for specialized services/equipment from Mine Services. Considerations may include the need for spill containment, contaminant recovery and waste disposal.

Level 1

• Stand by and make professional services available as requested.

### Level 2

All the above plus:

- Liaise with and provide professional support to responsible department team leader as appropriate.
- If ongoing safety concerns or hazardous conditions are present, ensure area is secured as necessary.
- Ensure all response personnel are properly equipped.
- In consultation with responsible department team leader, determine the need for specialized services/equipment from Mine Services or other sources.

#### Level 3

All the above plus:

- Respond to Code One.
- Undertake initial assessment of the incident in conformance with SOP SAFE-SWP-EME-03.
- Assume role of on-scene commander.
- Coordinate site safety and environmental requirements as needed.
- Document/record information relating to all ongoing activities (including log, photographs, etc.) is maintained.

## Note: Avoid statements that offer speculation as to cause or responsibility.

Note: At each stage of emergency, designated individuals have the responsibility to ensure that the following assigned tasks are carried out. In their absence, this responsibility is assigned to their designated alternate or may be assumed by other Emergency Response Team personnel.

A summary of roles and responsibilities on an emergency level basis is presented in Table 10, Spill Contingency Plan – Summary Action Plan.

## Table 10 – Summary Action Plan

Emergency Level	First on Scene	Team Leader Responsible	Emergency Response	On-Scene Commander	Mine Services	OHS-Security	Environment Department	Community & External	General Manager	President
		Department	ream							
Situation localized to one area. No off -site risks, no risk to sensitive environmental receptors	<ul> <li>Assess initial severity of spill</li> <li>Assess safety concerns</li> <li>Identify source of spill</li> <li>Report to Team Leader</li> <li>Participate in clean-up</li> </ul>	<ul> <li>Confirm initial severity of spill</li> <li>Confirm any safety concerns</li> <li>Initiate spill response plan</li> <li>Gather information / facts</li> <li>Prepare internal spill report, submit by First Priority</li> <li>Act as spill clean-up Team Leader</li> <li>Take initial action to control source of spill</li> </ul>	<ul> <li>Provide professional advice as required</li> </ul>		- Provide services as required	- Ensure PPE is appropriate and is being used	<ul> <li>Ensure that internal spill report is complete</li> <li>Ensure that spill is reported as per license and regulatory requirements</li> <li>Verify clean-up</li> </ul>	<ul> <li>Provide support as required</li> <li>Monitor spill events</li> </ul>		
Level II										
Situation is not contained in one area and there is a potential hazard to the Environment and Plant Production	<ul> <li>Same as above plus:</li> <li>Ensure safety of people in the area</li> </ul>	<ul> <li>Same as above plus:</li> <li>Proceed to spill site</li> <li>Contact Environment Department</li> <li>Evacuate area, if required</li> <li>Ensure facility operations are secure</li> <li>Contact Mine Services for additional resources as needed</li> <li>Consult with Environmental Specialist</li> <li>Develop control strategy to minimize impact</li> </ul>	<ul> <li>Same as above plus:</li> <li>In conjunction with Responsible Department Team Leader, make Emergency Response Team response available as required</li> </ul>	<ul> <li>Monitor potential escalation of initial emergency level assessment</li> </ul>	<ul> <li>Same as above plus:</li> <li>Provide additional resources to control spill</li> <li>Provide equipment and manpower for remediation</li> </ul>	<ul> <li>Same as above plus:</li> <li>Monitor ongoing safety concerns</li> </ul>	<ul> <li>Same as above plus:</li> <li>Establish contact with Responsible Department Team Leader</li> <li>Assist with the evaluation of the situation</li> <li>Confirm severity level</li> <li>Provide technical support to Responsible Department Team Leader</li> </ul>	<ul> <li>Same as above plus:</li> <li>Determine need for incident investigation</li> </ul>	<ul> <li>Ensure facility operations are secure</li> <li>Monitor events</li> </ul>	
Level III	·									
Significant impacts are observed to off-site areas, sensitive environmental receptors, potential disruption of Plant Operations	<ul> <li>Same as above plus:</li> <li>Shut down power supply</li> <li>Shut down pumps as necessary</li> <li>Isolate fuel storage as necessary</li> </ul>	- Same as above plus: - Initiate Code One - Identify exclusion zone	<ul> <li>Same as above plus:</li> <li>Secure and contain site</li> <li>Assess risk to operations, environment</li> <li>Commence logistic planning</li> <li>Monitor signs of escalation</li> </ul>	<ul> <li>Assume role of on-scene commander</li> <li>Establish on-scene command post</li> <li>In consultation with Environment</li> <li>Department, develop containment strategy</li> <li>In consultation with Site Security, initiate evacuation as necessary</li> <li>Determine need for additional specialized services</li> <li>Initiate log of events</li> </ul>	<ul> <li>Same as above plus:</li> <li>Respond to Code One</li> <li>Provide coordination of equipment and manpower as needed</li> <li>Under the direction of on-scene commander, provide resources for containment, recovery and clean-up</li> </ul>	<ul> <li>Same as above plus:</li> <li>Respond to Code One</li> <li>In consultation with on-scene commander, provide site security services as needed</li> </ul>	<ul> <li>Same as above plus:</li> <li>Respond to Code One</li> <li>In consultation with on-scene commander, assess environmental risks</li> <li>Develop containment plan</li> <li>Develop remediation plan implementation</li> <li>Progress reports</li> <li>Determine need for long-term management / monitoring of spill site</li> <li>Assess residual impacts</li> </ul>	<ul> <li>Same as above plus:</li> <li>Respond to Code One</li> <li>Proceed to site</li> <li>Monitor response</li> </ul>	<ul> <li>Same as above plus:</li> <li>Provide information to President</li> <li>Assess impacts on plant operations as necessary</li> </ul>	<ul> <li>Screen all external communications</li> <li>Approve external communication strategy</li> </ul>
Post Emergency Procedu	ures									
	<ul> <li>Assist with business resumption as appropriate</li> <li>Assist with incident investigation as required</li> </ul>	<ul> <li>Initiate incident investigation conjunction with EC &amp; EA as directed by OHS &amp; Security Manager or VP Operations</li> <li>Coordinate business resump</li> </ul>	in - Assist with incident investigation and follow-up reports/activities tion	<ul> <li>Level III emergency - coordinate clean-up remediation activities</li> </ul>	<ul> <li>Ensure emergency equipment is operational</li> <li>Assist with remediation as required</li> </ul>	<ul> <li>Assist Responsible Department Team Leader with post emergency responsibilities</li> </ul>	<ul> <li>Ensure written reports and logs are complete as required</li> <li>Undertake long-term site monitoring as required</li> <li>Complete clean-up verification report</li> </ul>	<ul> <li>Debrief Emergency Response Team</li> <li>In consultation with VP of Operations, initiate critical incident investigation</li> </ul>	<ul> <li>In consultation with EC &amp; CA, determine need for root cause analysis</li> </ul>	<ul> <li>Control of external corporate communications, news releases or other media response activities</li> </ul>

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## 5.4 Spill Response Actions

This section of the Plan provides generic information for planning spill response strategies and procedures depending on the receiving environment, transport mechanisms, and rate of release for the most significant material categories.

Spills of petroleum-based products are most common at EKATI or related sites. This category includes diesel fuel, hydraulic fluids, lubricating oils, and ethylene glycol-based antifreeze; however, other chemicals such as ammonium nitrate, sodium hydroxide, various acids, sodium hydrochloride, etc. also have a high potential to cause environmental damage.

Spills may be in the form of liquids (most petroleum products) or solids. Spills may take place on land/tundra, snow and ice, or water (lakes or streams), or a combination of any of these receiving mediums, depending on the conditions at the time of spill in northern climates.

This section of the SCP provides generic information in the following areas:

- Spills on land
- Spills on tundra
- Spills on or near bodies of water
- Spills on snow and ice

This section also provides generic guidance for the management of spill cleaning materials for hydrocarbon-contaminated snow, hydrocarbon-contaminated soil, and various absorbents.

## 5.4.1 Planning and Logistics

Feasibility to contain and recover spilled materials will largely be determined by the spill location, the size and rate of release, transport and terrain conditions. This information should be compared with the time needed to deploy response personnel, equipment and construction in order to evaluate what containment operation can be effectively implemented. The following response elements must be considered:

- Equipment and support material mobilization time
- Personnel mobilization, transmit and assembly at spill site
- Actual equipment set-up and deployment time
- 1. Determine whether or not a spill has entered a waterway and whether or not access by land or water to control points is possible so that booms, absorbents, skimmers and/or vacuum equipment can be deployed.
- 2. Establish priorities to optimize utilization of personnel and equipment/materials required for containment, recovery, storage, transportation and final disposal of all materials.

## 5.4.2 Spills on Land

Regardless of the chemical spilled, the containment activity must be as close to the spill site as safely possible. It is important that the potential for the spilled material reaching a body of water be minimized.

The following two options are available for containing the site of a spill:

- Berms or dykes surrounding the spill
- Trench or ditch intersecting the flow of spilled materials
- Berms and dykes may be constructed of soil, snow or sandbags

The berm/trench should be constructed downslope of the spill site if it is sloping terrain and is should be far enough away so that construction may be completed before the spilled material reaches the site. The trench should be perpendicular to the natural drainage contour of the site. The excavated material from the trench can be used for the construction of the berm along with other available materials.



Trenching and ditching is a good method for containing or intercepting the spread of liquid spills on land, especially if the spill occurs on steep terrain. Trenches and ditches should terminate in local, low-lying area, away from water bodies, where the spilled material can be accumulated for recovery or absorption and should be lined with plastic sheeting if available.

The trench or ditch should be approximately 40 to 50 cm deep intersecting the flow of spilled material.



Sandbags can be used for berm construction if available and if the site is too hard or frozen and it cannot be excavated and compacted. A plastic liner can be used to seal the trench and the sandbags should be anchored with gravel or rocks and be woven between layers of bags.

Containment areas may be lined with a synthetic liner if available to improve impermeability. As an alternate, during winter conditions, the containment area may be sprayed with water and allowed to freeze to minimize potential penetration into the underlying soil layers.

Generally, solid materials are naturally contained. If there is a danger of windblown spreading of the material, a layer of snow placed on the top of the material should be considered, as a temporary measure until a more comprehensive response can be developed.

## 5.4.3 Spills on Tundra

Tundra is generally saturated, with poor drainage and absorption capacity. The organic content is highly acidic material with very low soil bacteria and nutrient content. This makes it difficult to achieve any significant levels of bio-degradation of hydrocarbon spills, even in warmer climates.

Any attempts to mechanically clean up the spill on tundra can cause significant damage of the fragile tundra environment. Spraying a high nitrogen content fertilize and spreading topsoil or peat moss can foster biodegradation. Smaller spills are often best managed by allowing in-situ degradation. Larger spills must be managed to prevent further off-site migration by installing cut-off trenches and attempting to recover the free product.

In all cases, it is important to weigh the advantages of clean-up versus the potential negative impacts on the terrain. Both personnel and equipment on wet or sensitive areas can cause considerable damage. In many cases, the best solution may be to add nutrients to the contaminated area as noted above and monitor the site to ensure that the spill does not migrate to an adjacent sensitive area. In all case, the Environment Department must be consulted before any clean-up or containment work is undertaken.

## 5.4.4 Spills on Lakes and Streams

Containing spills in streams, especially fast-flowing or turbulent waters, can be difficult so rapid response is important. Containment of the spill should be as close to the point of entry as practical.

Spills in standing water may be contained by the deployment of absorbent booms so the floating material can be drawn back close to shore where it can be collected with a skimmer, vacuum truck or absorbents.

For the containment of spills and streams, it is important to determine the speed at which the water flows (same as the oil slick) and deploying the floating booms or constructing a temporary berm or inverted interceptor weir of the slick can be achieved.

In flowing streams, oil travels at the same speed as the surface current. On slow moving rivers, or in open lake areas, the oil slicks are also transported at a rate of approximately 3.5% of the wind speed. Although a comparatively small effect, it can be an important factor if the wind is at the right angle to the flow of water and if the water surface is expansive. The wind can drift the oil slick to the shoreline of the waterbody. Long reaches of the river may become contaminated although containment and recovery might also be possible. In smaller streams, the wind will have less impacts and the slick speed can be calculated by placing a small stick in the middle of the stream and measure the length of time required to travel a distance of 10 m.

This information can be quickly converted to speed (36/time (sec) = km/hour) to determine the estimated travel time to a confluence, other sensitive and/or proposed interceptor construction site.

Note: If the construction of temporary berm or interceptor weir is part of the spill response strategy, the potential environmental damage caused by such construction activities should be weighed against the impacts of the uncontrolled spill (especially for smaller spills).

If the waterbody is considered to be a fish habitat spawning stream, the Federal Department of Fisheries and Oceans must be consulted.

Deflecting booms to intercept an oil slick in a stream (especially slow moving waters) are effective strategies. The effectiveness of intercepting booms will decrease as the rate of flow increases. At speeds exceeding 0.5 m/s, hydrocarbons, especially diesel fuel, jet fuel, will become dispersed in the water and will pass under the boom, resulting in poor efficiency. Some improvement can be achieved in waters flowing at a higher rate (not turbulent) if the floating boom is placed at an angle to the shoreline. If the current exceeds a flow rate of 0.75 to 1 m/s, the boom should be deployed at an angle of 30 to 45 degrees to shoreline.



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Floating booms must be checked regularly. As they become saturated, they then lose their buoyancy and sink. The absorbent material will lose its capacity and often re-release materials back into the water.

Determining the best possible strategy for containment on water will depend on a number of factors. These are:

- Speed of slick travel
- Location of possible containment site
- Availability of personnel and equipment
- Proximity to environmentally sensitive areas
- Safety of operation

Generally, spills on water can be contained by using floating booms (either absorbent or nonabsorbent) or by constructing a temporary berm or inverted weir. The objective is to build a barrier against which the normally floating oil will pool while allowing the underflow of water.



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Booming with either absorbent or nonabsorbent booms can also be an effective means of containing spills on slow moving waters and in lakes. Effective containment using conventional booming techniques will be very difficult in rivers where currents exceed 0.7 knots (0.4 m/s). At these speeds, oil will become entrained in the water flowing under the boom, resulting in significant losses. Some improvements can be achieved in waters flowing at 1 to 2 knots (0.5 to 1 m/s) if the boom is deployed at an angle of less than 90° to the direction of the flow.

## 5.4.5 Spills on Ice and Snow

Hydrocarbon materials can remain relatively fresh (i.e., in an unweathered state) under snow and ice for several months or more after a spill.

Evaporation rates will still be high when oil is ultimately exposed to the atmosphere, except in very low temperatures. Oil can also move up and down small hills several metres high due to the capillary action of snow.

Snow and ice can be used to create berms to keep spills from spreading. In frozen rivers, angled slots about 1 m wide or holes can be cut in the ice, where safety permits, to allow possible spill recovery. The oil will rise up into the opening where it will concentrate, and be available for recovery using skimmers or pumps.



Oil spills in snow and ice can be sometimes burned if the spill can be isolated from the source. Although there is generally a reduced fire hazard, due attention to safety of operation is still required. If burning is not effective, recovered contaminated material will need to be collected and transferred to a designated disposal facility on site.

## 5.5 Post Emergency Procedures

Below is a summary of the post emergency process and guidance for resuming work and cleaning up an environmental spill.

## 5.5.1 Duties and Responsibilities

## Responsible Department Team Leader

Debrief on-scene personnel. Audit activities and evaluate.

- Initiate incident investigation and written follow-up report.
- Initiate re-start-up of facility operations as appropriate.
- Prepare internal report and submit to the Environment Department.
- In conjunction with the Environment Department and Mine Services, organize and direct cleanup operations. Coordinate ongoing site remediation.
- Coordinate requirements for major repairs and system testing.
- Release equipment and outside personnel.
- Coordinate incident investigation and follow-up report and actions.
- Coordinate wrap-up of procurement and cost control issues.

#### Environment Department

- Assist responsible department team leader with ongoing remediation requirements.
- Assist with incident investigation and follow-up reports.
- Provide report on spill incident and response action to regulatory agencies. In the event of a major incident, hold a post emergency debriefing with Emergency Response Team.
- Ensure all incident logs and written reports are completed as required and submitted as per procedures outlined in Section H of this plan.

#### Emergency Response Team Coordinator

- Hold post-emergency meeting with team members, responsible department Team Leader and Environment Department representative and assess the efficiency and appropriateness of response.
- Initiate root cause analysis, process according to ICAM or MINICAM investigation guide.
- Provide comments and recommendations, regarding effectiveness and utility of Plan.

## 5.5.2 Remediation and Clean-Up

#### General

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Upon completion of the initial spill response, containment and recovery of contaminants to the maximum extent practically, site remediation must be initiated. The objective of the site remediation program is to ensure and confirm compliance with either the numerical criteria established by regulatory agencies or the approved risk management criteria developed for the specific site and contaminant. This will normally comprise the determination of contaminant concentrations remaining at the site relative to the approved criteria, but may also involve the monitoring of concentrations at potential points of exposure identified during the assessment phase of the response.

In case of long-term remediation measures, additional monitoring and testing will be required at appropriate intervals following implementation of the measures. In the event of a Level 1 or Level 2 spill emergency the Environment Department must be consulted with a view to developing and implementing the most appropriate remediation strategy. Ongoing monitoring and testing will also be required in some cases where the scope of the remediation work, for example the extent of excavation, is not determined at the outset.

#### **Remediation Methods**

In the event of a Level 2 incident the Environment Department should be consulted.

In the event of a Level 3 incident (Code One) regardless of size of the discharge, the remediation strategy must be developed in consultation with and approved by Environment Department.

Excavation and disposal of contaminated soils are most commonly applicable method if the risk of off-site contamination or impacts on sensitive environmental receptors is low.

In the event the spill may impact on surface water quality, the requirements for monitoring and testing during and following remediation are based on the need to ensure that the quality of the surface water is within applicable standards and the effect of the operations on surface water regime are acceptable and controlled. Sampling and analysis of surface water samples will be required periodically to determine concentrations of contaminants. The extent of verification testing required in each case will be dictated by a number of factors including the degree to which the extent of contamination was defined in the initial investigation, the remediation approach adapted and the amount and type of testing conducted during remediation.

#### **Remediation Plan**

Remediation plan developed in consultation with and approved by the Environment Department must contain the following elements:

- Remediation program
- Implementation strategy
- Operation and monitoring
- Contaminant disposal and treatment
- Reclamation feasibility and impacts
- Spill close-out procedures

• Post-remediation site conditions and any applicable restrictions

The remediation management plan must contain:

- Schedule
- Remediation sequence
- Duration of each remediation activity
- Remediation monitoring (sampling and analysis program)
- Progress reporting
- Long-term management and monitoring requirements, if any
- Identification of any adverse environmental impacts that cannot be fully mitigated by proposed remediation plan
- Analysis of these impacts in terms of alternative remediation strategies

## 5.5.3 Verification of Remediation

Upon completion of the remediation process or, in case of long-term risk management measures, at appropriate intervals during the risk management process, testing will be required to confirm the achievement of remedial criteria. Principally, this will require analysis of contaminant concentrations in soil and/or water samples relative to the accepted risk management objectives or numerical criteria and may also involve the monitoring of concentrations of potential points of exposure identified in risk evaluation.

The requirements for verification of soil and water remediation are discussed in the SOP.

Records of remediation activities and achievement of remedial objectives must be submitted to regulatory authorities.

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## 5.6 Spill Reporting Procedures

## <u>General</u>

According to the Northwest Territories Environmental Protection Act - Consolidation of Spill Contingency Planning and Reporting Regulations (RRNWT 1990, C) a person who causes or permits the release or the person having control of the released substance is responsible for reporting the release and for determining whether there was an adverse effect.

## Internal Reporting

The responsible department Team Leader must report all environmental incidents, including spills, to the Environment Department. Team Leader's are required to complete the EKATI Spill Report Form and submit to the Environment Department via email. The Environment Department must receive the completed Spill Report Form within 12 hours of an incident in order to meet the required 24-hour reporting deadline.

#### External Reporting

Regulatory reporting requirements are defined by the Spill Contingency Planning and Reporting Regulations (RRNWT 1990, C). A completed spill report to the NWT Spill Line and DIAND inspector must be submitted within 24 hours of a spill occurrence. In addition, a spill closure report must be submitted to the DIAND inspector after the completion of the clean up and sign off. Section 9(1) of the Regulations defines reporting requirements. According to Regulations, the owner or person in charge or control of contaminants at the time a spill occurs shall immediately report, any spill and it's location, if it is of an amount equal to or greater than the amount set out in Schedule B of the Regulations.

The report must contain the following information:

- Date and time of spill
- Location of spill
- Direction that the spill is moving
- Name and phone number of contact person
- Type of contaminant and quantity spilled (estimated)
- Cause of spill (Note: Only factual information should be reported; speculation as to the cause of the spill or responsibility for the spill should be avoided.)
- Indication as to whether the spill is continuing or has stopped
- Description of existing containment
- Action taken to contain, recover, clean up and dispose of spilled contaminant
- Name, address and phone number of person reporting the spill

 Name of owner or person in charge, management or control of the contaminant at the time of the spill

Schedule B of Section 9 of the Regulations defines reportable spills according to the Transportation of Dangerous Goods Regulations (TDGR) Classification. (Note: While the Northwest Territories Environmental Protection Act and its regulations define reportable spills, the Water License may impose more stringent reporting requirements such as all spills must be reported to the DIAND inspector.)

The National Fire Code identifies notification procedures for product loss clause. Reference to the "authority having jurisdiction" refers to an officer in the fire discipline exercising authority in accordance with the Code. In most cases, notification under the Fire Code is made to the Territorial Fire Department. Notification for releases of flammable or combustible liquids, which necessitates immediate attention to mitigate risk of fire or explosion, is to be made to the closest municipal fire department.

Under provisions of the National Fire Code, the owner of a storage tank shall immediately notify the authority having jurisdiction in the event of a spill of more than 50 litres within 24 hours after a leak or discharge is suspected, as indicated by any one of the following:

- a) Any unexplained loss or gain of 2.0% or more of the throughput from an above ground storage tank, for each stored period in a calendar month, as indicated by the recording and reconciliation of inventory records, done in accordance with the Code.
- b) Inventory reconciliations showing five consecutive days of unexplained product losses.
- c) Inventory reconciliations showing 18 days of unexplained losses in one calendar month.
- d) Failure of a precision leakage test which indicates a loss or gain of product.
- e) Failure of hydrostatic pipe test.
- f) The presence of free or dissolved product on-site or off-site in the soil, groundwater, surface water, sewer lines, utility lines, water supply lines, crawlspace or on the ground surface.

## 5.7 Training and Competence

## <u>General</u>

This section clarifies responsibility and provides guidelines for training EKATI personnel who respond to spills.

Health and safety legislation holds the employer responsible for ensuring responders are competent. Competency includes ensuring the responder has the required knowledge and skills, obtained by way of education, training, experience or a combination thereof. Responders who have not demonstrated competency must work under the direct supervision of a competent responder. WHMIS regulations require that all workers understand the risks posed by the substances to which they may be exposed.

Responders to spills require the capability to analyze an incident, plan a response, implement a planned response, evaluate the progress and terminate the response. These actions are to be performed in a manner consistent with EKATI's Plan and SOPs.

The skills required to respond vary with the complexity of the incident. Response escalation is progressive with the amount and type of material involved and the environmental sensitivity of the site. Responders must be able to recognize their own limitations and identify situations where additional knowledge, skills or resources are required for safe resolution of the incident. In these situations the Plan identifies additional resources on how they may be contacted as per the documented response plans.

EKATI may use its own internal resources to provide training. There is no requirement for external training, minimum training hours or external certification. Records of attendance for Spill Response training presentations are maintained by the Environment Department.

All responders do not necessarily have to be trained to perform all tasks, but collectively the responders must have the required knowledge and skills. The assignment of responsibility to perform the tasks are outlined in the Plan.

BHPB has a commitment for each person involved in emergency response to fully understand their roles during an emergency as well as the roles of those with whom they will interact. In order for this commitment to be achieved, as well as for EKATI personnel to respond effectively, training activities will be carried out as follows.

#### General Responsibilities (Orientation)

All members of the EKATI Emergency Response Team and operations personnel who may be involved in spill-related activities will receive an orientation to the Plan. Team Leaders are responsible for the training of their staff and must ensure that employees are familiar with aspects of their response plan.

In order to keep knowledge of the current Plan, a portion of regular safety and/or staff meetings will be devoted to the discussion of emergency response issues on an ongoing basis.

EKATI personnel who may, from time to time, in course of their regular activities are observers or first on site, must be familiar with the following elements of the Plan.

- Report the incident in accordance with the Plan.
- Notify Responsible Department Team Leader.

- Understand why he should not leave the incident scene and the importance of obtaining assistance to report the incident to supervisors.
- Procedures to declare Code One

The preceding items require knowledge of who to contact, their telephone and cell numbers, alternate contact numbers, a means of making contact and understanding the information that is to be communicated during the notification (including location, nature of emergency, extent of emergency, etc.). The Responsible Department Team Leader must perform procedures in the Plan for which he has been adequately trained and equipped. As a minimum, this should include:

Analyze the incident and plan an initial response if safe to do so. Analysis of the spill may include the following:

- Product identification, hazard description and measures required to protect personnel, company resources and the environment.
- Estimation of hazards to ongoing operations.
- Potential losses/exposures resulting from the spill.
- Identification of prioritized response objectives within the capability of the individual.
- Recognition of the need to escalate the response.
- In addition to the above, training will be required in the following areas:
- How to secure the area by ensuring persons are in safe locations if deemed necessary.
- Under what conditions a Code One must be declared and involve a higher level of response.
- Understanding the requirements for basic personal protection equipment (PPE) and recognize the requirements for more advanced personal protection equipment.
- Understand the basic fire hazards and measures required for removing possible sources of ignition.
- Stopping the flow of liquid contaminants by operating shut-off devices or patching leaks with available materials (if appropriate to do so and can be accomplished safely).
- Blocking off drains, manholes and culverts and potential pathways to sensitive environmental receptors.
- Constructing dikes and ditches.
- Using sorbent booms to surround spill areas.

- Using absorbent materials.
- Assisting Emergency Response Team personnel to manage the response and to minimize residual impacts, risks to the environment and company resources.
- Emergency response training provided to team leaders may be adequate to respond to minor incidents. Team leaders must, however, recognize their limitations and must be capable of escalating the response to involve the Emergency Response Team trained in the tasks required to handle more complex incidents.

## Scientific Advisors

Responders in this category provide information. Responders trained to this level do not enter the exclusion zone identified for the spill scene. These responders are not part of an organized response team but they are the scientific authority to provide expertise in determining most appropriate control and remediation strategies. Such responders must have the knowledge and skills to safely perform the following duties and tasks.

- Provide information on hazards and harmful effects of the spilled material.
- Advise the Responsible Department Team Leader or the On Site Commander on the hazards and harmful effects of the spilled substance.
- Understand the product information available from Canadian Transport Emergency Centre (CANUTEC) and demonstrates capability to contact CANUTEC and suppliers to provide additional hazard information (see Table 9 for contact information).
- Understand critical product information on relevant MSDSs.
- Provide information on potential response options for the substance or site-specific conditions.
- Understand EKATI's internal and external notification requirements.
- Understand how an incident management system is implemented at incident scene (not expected to implement an incident management system).
- Understand the "disciplined approach to emergency response" (not expected to lead the disciplined approach process).
- Understand EKATI's plans for all external communications (not required to present information to public or the media).
- Ability to evaluate various control and remedial options.
- Ability to develop a remediation plan.
- Skills to undertake ongoing monitoring of spill sites and evaluate success of remedial action.

Emergency Response Team Training

Members of the EKATI Emergency Response Teams (ERT) must have valid WHMIS certificates, familiar with the use of MSDS, training in the use of spill kits, use of personal protection equipment, use of fire extinguishers, and related equipment.

#### Plan Exercises

A regular program of exercises for EKATI Emergency Response Team(s) will be utilized to facilitate the readiness of all personnel.

Exercises will be planned by the ERT Coordinator. Exercises will be conducted according to the following program.

**Communication exercises** should be carried out with the cooperation of all departments who may be called upon to respond to emergencies.

- Contacts should be limited to EKATI personnel and key government agencies.
- Exercises may be initiated by the Occupational Health and Safety Superintendent.

Tabletop exercises will be carried out once per year for EKATI's Emergency Response Team.

- Program will include a pre-scenario briefing followed by the exercises and de-briefing session.
- Scenarios that will be used will be developed by the Occupational Health and Safety Superintendent in conjunction with appropriate department team leaders and the manager of the Environment Department.

**Logistics exercises** will be carried out on a periodic basis as determined by the Occupational Health and Safety Superintendent.

As appropriate, the exercises will include the following groups:

- Mine Operations
- Process Plant
- Supply and Operations Services
- Underground Operations
- Appropriate contractors (e.g. Polar Explosives)

**Planning** for exercises will be coordinated with the assistance of the Emergency Response Team(s). Scenarios to be used will be developed in consultation with the Environment Department.

# 6.0 Accountabilities

POSITION TITLE	ROLE	DESCRIPTION OF ACCOUNTABILITY
Environment Advisor- Compliance	Update Plan	Update plan with relevant administrative and operational changes annually.
Environment Advisor- Compliance	Training	Annual ERT training and awareness of the plan, includes practical and table-top exercises.
Environment Advisor- Compliance	Implementation	Insure the plan is available site wide and the workforce is aware of its contents.
Environment Superintendent- Operations	Review Plan	Review updates.
Health and Safety Advisors	Execute Plan	In the event of an emergency the ERT must be able to execute the plan.
Head of HSEC	Approval	Review and approve the plan.
General Manager	Resource Allocation	Allocation of sufficient resources to execute the plan.

# **Appendices**

# **Appendix 1.0 Definitions and Abbreviations**

TERM	DESCRIPTION
Emergency	An emergency is defined as any unexpected occurrence either resulting in or having the likely potential to pose a threat to on-site personnel or the general public, result in environmental impacts, impact production, or potential damage to company or public property. The response to such incidents will require immediate notification and action.
Levels of an Emergency	A subjective measure of the overall severity of the emergency.
Level 1 Emergency	Confirmed emergency has or is occurring with effects confined to one area of the facility site – no immediate hazards to off-site or sensitive environmental receptors exist.
Level 2 Emergency	Emergency has broader site-wide impacts and/or minimal potential for impacts off site; some minor hazards to sensitive environmental receptors may exist.
Level 3 Emergency	Emergency with potential serious impacts outside the immediate area of the emergency – definite and serious hazards to off-site or sensitive environmental receptors exist, or interruptions of facility operations are anticipated.
Adverse effect	Impairment of or damage to human health, safety, the environment or property.
Code One	A site-wide notification that an emergency is in progress. All Team Leaders are responsible to stop work that may cause additional risk of injury or fire, and require the emergency response team (ERT).
Company	Refers to EKATI Diamond Mine, a facility operated by BHP Billiton Canada Inc.

TERM	DESCRIPTION
Criteria	Maximum allowable concentrations of a contaminant in soil or water.
Critical Incident Stress	Physical or mental stress that may be experienced by individuals involved in any emergency situation. This may occur during, shortly after, or in certain individuals, some time after a period of high stress. Professional counseling may be required to assist individuals.
Emergency Action Team	A predetermined group of individuals whose purpose is to provide on-site expertise and manpower to assist the on scene commander in bringing the emergency to an early, successful conclusion.
Emergency Log	A detailed written account of times, events and actions taken during an emergency.
Emergency Response Centre	A predetermined area established by management, designed to facilitate coordination of overall company response.
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.
Emergency Response Team (ERT)	The pre-established team of specially trained personnel, appropriately equipped, to response to significant emergency situations at the EKATI site, and nearby locations, as appropriate, including the management/control of releases of hazardous substances that represent a risk to human health, the environment or company operations.
Evacuation Assembly Areas	Pre-designated points located outside the site where evacuated personnel assemble in the event of a facility evacuation.
Evacuation Coordinator	The individual assigned to coordinate the evacuation of personnel or the public from the emergency area.
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.

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TERM	DESCRIPTION
On Scene Commander (OSC)	Individual in charge of managing emergency response activities at the immediate scene of an emergency.
On Scene Command Post	A location at the actual emergency scene where site management and control of emergency response activities at the scene originates.
Post Emergency Procedures	An outline of specific tasks required to debrief all individuals involved in an emergency.
Responsible Department	Department or operating unit that is in control of the substance immediately prior to the uncontrolled/unplanned release (spill incident).
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 comprehensive plan providing guidance on the counter measures needed to minimize or eliminate the consequences of specific hazards impacting on the environment, facilities or operations. It also identifies the resources and their locations that are needed to implement the counter measures.

# Appendix 2.0 Approvals Framework

Approvals for the Procedure including related documents:

REVIEWER ROLE	NAME	SIGNATURE	DATE	
Superintendent Environment-Operations	Keith McLean	Kel ma	04-Aug-2011	
Environment Advisor-Compliance	Jamie Steele	After	-Aug 4 2011	
APPROVED BY		ma	,	
Head of HSEC	Karl Schubert	Sim	64/08/201	

APPROVAL SIGNATURES RECORD EKA PRO. 2104				
REVIEWER ROLE	NAME	SIGNATURE	DATE	
Superintendent Environment-Operations				
Environment Advisor-Compliance				
APPROVED BY				
Head of HSEC				

# Appendix 3.0 Track Changes

[All changes within this document must be recorded]

REVISION NUMBER	PAGE NUMBER(S)	CHANGE EFFECTED	DATE OF CHANGE

## Appendix 4.0 Environment Canada Cross-reference to *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*

STS Regs reference	Information required	Location of information in this emergency plan
s. 30(1)	The owner or operator of a storage tank system must prepare an emergency plan taking into consideration the following factors:	
s. 30(1)(a)	- the properties and characteristics of each petroleum product (i.e. Jet A1) or allied petroleum product stored in each tank of the system and	Table 1 in the Plan Properties of all substances can be found in the EKATI MSDS Database
s. 30(1)(a) continued	- the maximum expected quantity of the petroleum product or allied petroleum product to be stored in the system at any time during any calendar year; and	Table 1 in the Plan
s. 30(1)(b)	- the characteristics of the place where the system is located and of the surrounding area that may increase the risk of harm to the environment or of danger to human life or health.	Table 1 and figures 3,4,5,6,7,8. Additionally a GIS file has been created with all geographical features of the storage tank locations.
s 30(2)	The emergency plan must include:	
s. 30(2)(a)	- a description of the factors considered under s. 30(1)	- See the rows above.
s. 30(2)(b)	- a description of the measures to be used to prevent, prepare for, respond to, and recover from any emergency that may cause harm to the environment or danger to human life or health;	<ul> <li>Prevention – Section 5.2 Spill Prevention</li> <li>Prepare for – Section 5.7 Training and competence</li> <li>Respond to – Section 5.3 Emergency Response Action Plan, and 5.4 Spill Response Actions</li> <li>Recover From – Section 5.5 Post Emergency Procedures</li> </ul>
s. 30(2)(c)	- a list of the individuals who are required to carry out the plan and a description of their roles and responsibilities;	Tables 7,8,9,10 (contacts and summary action plan) and section 5.3.5 Responsibilities
s. 30(2)(d)	<ul> <li>identification of the training required for each of the individuals listed under s. 30(2)(c);</li> </ul>	Section 5.7 – Training and Competence
s. 30(2)(e)	- a list of the emergency response equipment included as part of the plan, and the equipment's location; and	Tables 3,4,5,6 (lists of emergency response equipment) and section 5.3.2 – Inventory of Response and Cleanup Equipment

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s. 30(2)(f)	- the measures to be taken to notify members of the public who may be adversely affected by the harm or danger referred to in s. 30(2)(b)	Table 10 – Summary Action Plan
s. 30(3)	The owner or operator of a storage tank system must ensure that the emergency plan is ready to be implemented:	
s. 30(3)(a)	- in the case of a storage tank system that is installed before the coming into force of these Regs, no later than two years after the day on which these Regs come into force (i.e. by 12 Jun 2010); and	Plan is well established and is readily accessible to the workforce
s. 30(3)(b)	- in any other case, before the day on which the first transfer of petroleum products or allied petroleum products into any tank of the storage tank system occurs.	See note above
s. 31(1)	The owner or operator of a storage tank system must keep: - the emergency plan up-to-date and - keep a copy of it readily available for the individuals who are required to carry it out, - as well as a copy at the place where the storage tank system is located if that place is a place of work.	Section 4 – Regulatory Framework Plan is reviewed annually and updated as necessary. Plan is readily available in document repository and web portal link.
s. 31(2)	The owner or operator must notify the Minister of the civic address of each location where the emergency plan is kept.	Section 5.1 Facility description
s. 32(1)	If the owner or operator of a storage tank system has prepared an emergency plan with respect to the system on a voluntary basis or for another government or under an Act of Parliament and the plan meets the requirements of s. 30(1) and (2), they may use that plan for the purposes of meeting those requirements.	Section 4 – Regulatory Framework
s. 32(2)	If the plan does not meet all of the requirements of s. 30(1) and (2), the owner or operator may use the plan if they amend it so that it meets all of those requirements.	NA

## Appendix 5.0 Spill Response – Acetic Acid

Consider action only if safety permits! Avoid contact with acetic acid - it is a corrosive liquid! Eliminate ignition sources. Stop source if safe to do so. **On Land** Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth, sand or other barrier. Remove minor spills with universal sorbent. Remove large spills with pumps or vacuum equipment. Neutralization with lime or sodium bicarbonate can be tried. **On Snow** Block entry into waterways & Ice Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove minor spills with universal sorbent. Remove large spills with pumps or vacuum equipment. Remove contaminated snow with shovels or mechanical equipment. **On Muskeg** Do not deploy personnel and equipment on marsh or vegetation. Remove pooled acetic acid with pumps. Burning is not recommended. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried, if feasible. **On Water** Acetic acid sinks and mixes with water. Isolate/confine spill by damming or diversion. Water flushing can be tried to disperse acid. Neutralization with lime or sodium bicarbonate can also be tried. Storage Store closed labelled containers in cool, ventilated areas away from & Transfer incompatible materials, e.g., organics, finely divided metals and oxidizable materials. Disposal Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

# Appendix 6.0 Spill Response – Acetylene and Propane

Consider action only if safety permits!

Gases stored in cylinders can explode when ignited! Keep vehicles away from accident area.

Refer to Product Guide in Contingency Plan for:

Physical/Chemical Properties Response to Fires First Aid

- Vapours cannot be contained when released.
- Water spray can be used to knock down vapours if there is NO chance of ignition.
- Small fires can be extinguished with dry chemical or CO<sub>2</sub>.
- Personnel should withdraw immediately from area unless a small leak is stopped immediately after it has been detected.
- If tanks are damaged, gas should be allowed to disperse and no attempt at recovery should be made.
- Personnel should avoid touching release point on containers since frost quickly forms.
- Keep away from tank ends.
#### Appendix 7.0 Spill Response – Ammonium Nitrate

Consider action only if safety permits!

Prolonged contact and repeated skin contact can cause irritation.

Eliminate ignition sources.
Stop source if safe to do so.

On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth, sand or other barrier. If liquid remove minor spills with sorbent, large spills with pumps or vacuum equipment. Prills/granules can be shovelled or removed mechanically. On tundra, spread and leave as fertilizer, if feasible to do so.
On Snow & Ice	Block entry into waterways; dike using snow or other barrier. Remove ammonium nitrate and contaminated snow with shovels or other mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove ammonium nitrate with shovels or other mechanical means if feasible to do so. Burning is not a feasible response option. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried, if feasible. Minor spill amounts can be left in place to serve as a fertilizer.
On Water	Ammonium nitrate is completely soluble in water. Isolate/confine spill by damming or diversion if feasible. Water flushing can be tried to disperse spill.
Storage & Transfer	Store closed, labelled containers in cool, ventilated areas away from incompatible materials, e.g., oxidizable materials.
Disposal	Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

# Appendix 8.0 Spill Response ANFO (Ammonium Nitrate/Fuel Mixture)

#### Potential explosive – consider action only if safety permits!

ANFO may detonate in fire or under severe impact or confinement

#### Eliminate ignition sources. Stop source if safe to do so.

On Land	Oil may be released from pellets. Do not flush into ditches or drainage systems. Contain any spill by diking with earth or other barrier. Prevent contact with water; block entry into waterways. If ammonium nitrate contacts water, confine to as small an area as possible. On dry surfaces, shovel ANFO into containers. On tundra, spread and leave as fertilizer, if feasible to do so.
On Snow & Ice	Block entry into water; dike using snow. Pick up with shovels or other mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Leave small releases of ammonium nitrate in place if cleanup will result in more damage than the spill. Burning is not likely safe or feasible. Minimize damage caused by equipment and personnel.
On Water	Ammonium nitrate mixes with water and is difficult to recover Released oil will float to surface. Isolate/confine spill by damming or diversion. Remove oil using sorbent pads. Ammonium nitrate can be toxic to aquatic life in concentrations as low as 10 ppm. Flush and disperse with water, if feasible.
Storage & Transfer	Place collected material in waterproof containers. Store closed, labelled containers in cool ventilated areas away from incompatible materials.
Disposal	Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 9.0 Spill Response – Caustic Soda (NaOH)

	Consider action only if safety permits! Avoid contact with caustic soda - it is a corrosive liquid!
	Contact with metals may evolve flammable hydrogen gas Stop source if safe to do so.
On Land	Block entry into waterways or confined areas Do not flush into ditches or drainage systems. Contain spill by diking with earth, sand or other barrier.
Remo	ve minor spills with dry earth, sand or other non-combustible material.
	Remove large spills with pumps or vacuum equipment. Neutralization with dilute hydrochloric acid can be tried in unconfined areas.
On Snow & Ice	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove minor spills with dry earth, sand or other non-combustible sorbent. Remove contaminated snow with shovels or mechanical equipment.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove pooled caustic soda after neutralization with pumps. Burning is not feasible. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried, if feasible.
On Water	Caustic soda sinks and mixes with water generating heat. Isolate/confine spill by damming or diversion. Water flushing can be tried to disperse the caustic soda. Neutralization with dilute hydrochloric acid can also be tried.
Storage & Transfer	Store closed, labelled containers in cool, ventilated areas away from incompatible materials, e.g., finely divided metals and combustible materials. Do not get water inside any storage container.
Disposal	Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Environmental Superintendent – Operations for any post spill requirements.

## Appendix 10.0 Spill Response – Diesel, Hydraulic, Lube and Waste Oil

#### Consider action only if safety permits! Eliminate ignition sources. Stop source if safe to do so. On Land Do not flush into ditches or drainage systems. Block entry into waterways and contain with earth or other barrier(s). Remove small spills with sorbent pads. On tundra use peat moss and leave in place to degrade, if practical. **On Snow** Block entry into waterways and contain with snow or other barrier & Ice Remove minor spills with sorbent pads and/or snow. Use ice augers and pump when feasible to recover diesel under ice. Slots in ice can be cut over slow moving water to contain oil. Burn using Tiger Torches if unrecoverable by other methods, feasible and safe to do so. **On Muskeg** Do not deploy personnel and equipment on marsh or vegetation. Remove pooled oil with sorbent pads and/or skimmer. Flush with low pressure water to herd oil 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). 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, obtain and use skimmer on contained slicks. **Rivers &** Prevent entry into water, if possible, by building a berm or trench Streams Intercept moving slicks in quiet areas using (sorbent) booms. Do not use sorbent booms/pads in fast currents and turbulent water. Storage Store closed labelled containers outside away from flammable & Transfer items Electrically ground containers and vehicles during transfer to designated disposal/treatment area Disposal Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 11.0 Spill Response – Ethylene Glycol (Antifreeze)

#### Consider action only if safety permits!

On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth or other barrier. Remove minor spills with universal sorbent. Remove large spills with pumps or vacuum equipment.
On Snow & Ice	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove minor spills with universal sorbent. Remove contaminated snow with shovels and mechanical equipment.
On Muskeg	Remove pooled antifreeze with pumps. Do not deploy personnel and equipment on marsh or vegetation. Burning is not feasible. Minimize damage caused by equipment and excavation.
On Water	Ethylene glycol sinks and mixes with water. Isolate/confine spill by damming or diversion.
Storage & Transfer	Store closed, labelled containers in cool, ventilated areas away from incompatible materials, e.g., organics, finely divided metals and oxidizable materials.
Disposal	Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 12.0 Spill Response – Ferrosilicon

Consider action only if safety permits!

May produce flammable and toxic gases on contact with water!

	Eliminate ignition sources. Stop source if safe to do so.
On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth, sand or other barrier. Remove spills with shovel without generating dust.
On Snow & Ice	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove spills with shovels or mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove spilled material manually. Minimize damage caused by equipment and excavation. Depending on situation covering spilled material with dry earth or sand may be the preferred option.
On Water	Ferrosilicon is insoluble in water but impurities may dissolve. Isolate/confine spill by damming or diversion. Material may generate hydrogen and acetylene gases when exposed to water.
Storage & Transfer	Store closed, labelled dry containers in cool, ventilated areas away from incompatible materials, e.g., caustic soda, acids and oxidizers. Do not seal damp or wet materials in containers.
Disposal	Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 13.0 Spill Response – Flocculants and Coagulants

#### Consider action only if safety permits!

On Land	Prevent contact with water and block entry into waterways. Do not flush into ditch or drainage systems. Contain spill by diking with earth or other barrier. Attempt to avoid wetting any spills of the dry white granular powder. Remove minor spills with shovels. Remove large spills with backhoes, other mechanical methods.
On Snow & Ice	Confine and contain spill to as small an area as possible. Recover using shovels and place in waterproof containers. Small spills can be removed by picking up snow.
On Muskeg	Remove accumulations manually with shovels. Do not deploy personnel and equipment on marsh or vegetation. Burning is not a feasible response option. Minimize damage caused by equipment and personnel.
On Water	Flocculants and coagulants are soluble in water. Isolate/confine spill by damming or diversion. Water flushing can be tried to disperse spills into water.
Storage & Transfer	Place in waterproof container(s). Store closed labelled containers in cool, ventilated areas away from incompatible materials.
Disposal	Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

Spilled flocculants and coagulants within the processing plant can create a hazard because of their slippery nature.

## Appendix 14.0 Spill Response Fuel Dye

Consider action only if safety permits!

Fuel Dye which contains benzene and xylene forms vapours that can explode and ignite!

	Eliminate ignition sources. Stop source if safe to do so.
On Land	Block entry into waterways by diking with earth or other barrier. Do not flush into ditches or drainage systems. Do not contain spill if there is any chance of igniting vapours On shop floors and in work yards, apply inert absorbents such as dry clay or commercial particulate sorbents. On tundra use peat moss and leave to degrade if feasible to do so.
On Snow & Ice	Block entry into waterways by diking with snow or other barrier(s). Do not contain spill if there is any chance of igniting vapours. Soak up with sawdust, sand or dry clay/earth. Remove minor spills with universal sorbent. Remove contaminated snow with shovels or mechanical equipment.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove pooled fuel dye with pumps, if safe to do so. Burning is not recommended. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried to disperse small spills, if feasible.
On Water	Do not attempt to contain or remove spills. Use booms to protect water intakes and sensitive areas.
Storage & Transfer	Store closed, labelled containers in cool ventilated areas away from incompatible materials, e.g., oxidizing and reducing agents Ensure containers are tightly closed.
Disposal	Segregate waste types, if necessary.
	Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

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#### Appendix 15.0 Spill Response – Gasoline and Jet A Aviation Fuel

#### Consider action only if safety permits! Gasoline and Jet A form vapours that can ignite and explode! No smoking!

	Eliminate ignition sources. Stop source if safe to do so.
On Land	Block entry into waterways by diking with earth or other barrier. 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.
On Snow & Ice	Block entry into waterways by diking with snow or other barrier(s). Do not contain spill if there is any chance of igniting vapours. In work/depot yards, apply particulate sorbents.
On Muskeg	Remove pooled gasoline or Jet A 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 <b>carefully</b> only in localized areas, e.g., trenches, piles or windrows. Do not burn if root systems can be damaged (low water table). Minimize damage caused by equipment and excavation.
On Water	Do not attempt to contain or remove spills. Use booms to protect water intakes and sensitive areas.
Storage & Transfer	Store closed labeled containers in cool ventilated areas away from incompatible materials Electrically ground containers and vehicles during transfer to designated disposal/treatment area.
Disposal	Segregate waste types, if necessary.
	Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

#### Appendix 16.0 Spill Response – Hydrochloric Acid (HCL)

Consider action only if safety permits!

Avoid contact with hydrochloric acid, it is a strong acid

First aid and medical treatment for HCI exposure is very specific and critical. Always use complete protective equipment in response to a HCI spill or leak.

On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth or other non-combustible absorbent material. Small spills can be neutralized by carefully covering with soda ash or lime. Remove small spills with vermiculite or earth sorbents.
On Snow & Ice	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by dyking with snow or other barrier. Remove minor spills with vermiculate or earth sorbents. Remove contaminated snow with shovels.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove pooled HCI with pumps only after neutralization. Burning is not feasible. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried, if feasible.
On Water	HCI readily mixes with water producing a vigorous exothermic reaction. Isolate/confine spill by damming or diversion. Water flushing can be tried to disperse acid. Neutralization with lime or soda ash can also be tried.
Storage &Transfer	Store in a cool, dry place away from incompatible materials. Avoid contact with glass, concrete, metals, other acids, oxidizers, reducers, alkalis, combustibles, organics and ceramics.
Disposal	Carefully place spilled material into clean dry polyethylene containers. Recommended safety apparel in handling includes goggles, face shield, neoprene gloves and acid resistant apron.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

# Appendix 17.0 Spill Response – N-7 Emulsifier (Sorbitan Monooleate)

#### Flammability rating is slight

No evidence of adverse health effects on exposure to N – 7

On Land	Avoid flushing to ditches or drainage systems. Block entry into waterways. Contain spill by diking with earth or other barrier. Remove small spills with shovels. On tundra, mechanically remove, if feasible to do so.
On Snow & Ice	Block entry into water since emulsifier is moderately soluble. Remove minor spills with shovels. Use ice augers and pump when feasible to recover under ice. Burning emulsifier is not practicable. Mechanical removal (scraping) can be tried.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove accumulations of emulsifier with shovels if possible. Minimize damage caused by equipment and personnel. Burning is not practicable.
On Water	Contain spill as close to release point as possible. Try containment boom to concentrate spill for pumping. On small spills, pump to storage or flush with large amounts of water. On larger spills, pumping and dispersal might have to be tried. Do not deploy personnel and equipment on marsh or vegetation.
Storage & Transfer	Store closed labelled containers outside. Drums can be used for containing collected emulsifier.
Disposal	Segregate waste types. Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

#### Appendix 18.0 Spill Response – N 23 Emulsifier

Consider action only if safety permits!

N 23 Emulsifier is primarily mineral oil but has characteristic petroleum odour

If burned may produce carbon monoxide and/or nitrogen oxide.

On Land	Do not flush into ditches or drainage systems. Block entry into waterways. Contain spill by diking with earth or other barrier. Remove small spills with sorbent pads. On tundra, use peat moss and leave to degrade, if feasible to do so.
On Snow & Ice	Block entry into water; dike using snow or other barrier. Remove minor spills with sorbent pads and/or snow. Use ice augers and pump when feasible to recover N 23 under ice. Burning N 23 will not likely be feasible. Mechanical removal (scraping) can be tried.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove pooled N 23 with pumps and skimmers. Flush with low pressure water to herd emulsifier to collection point. Minimize damage caused by equipment and personnel. Burning is not likely possible
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. Do not deploy personnel and equipment on marsh or vegetation.
Storage & Transfer	Store closed labelled containers outside away from flammable items. Drums can be used for containing collected N 23 Emulsifier.
Disposal	Segregate waste types. Place contaminated materials into marked containers.
	requirements.

#### Appendix 19.0 Spill Response – Nitric Acid

Consider action only if safety permits!

Avoid breathing in/contact with skin and eyes - nitric acid is a severe irritant!

	Reacts violently with water and fuels Stop source if safe to do so.
On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth, sand or other barrier. Remove minor spills with dry earth, sand or fly ash.
	Remove large spills with pumps or vacuum equipment after neutralization.
	Neutralization with lime, sodium bicarbonate or crushed limestone.
On Snow & Ice	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove minor spills with dry earth, sand or fly ash. Remove large spills with pumps or vacuum equipment after neutralization. Remove contaminated snow with shovels or mechanical equipment.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove pooled nitric acid after neutralization with pumps. Burning is not recommended. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried, if feasible.
On Water	Nitric acid sinks and mixes with water producing a violent reaction. Isolate/confine spill by damming or diversion. Water flushing can be tried to disperse acid. Neutralization with lime or sodium bicarbonate can be tried
Storage & Transfer	Store closed, labelled containers in cool, ventilated areas away from incompatible substances such as wood, oil, oxidizable materials
Disposal	Segregate waste types. Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

#### Appendix 20.0 Spill Response – Processed Kimberlite

During the operational life of the project, the diamond processing plant will produce 133 million tonnes of kimberlite material at an initial rate of 9000 tonnes/day, rising to 14,000 tonnes/day after ten years of operation. The processed kimberlite will be generated and disposed of at the existing processed kimberlite impoundment area located immediately west of the processing plant. Any discharges or seepages of processed kimberlite that may occur as a result of a malfunction of the processed kimberlite impoundment dams or discharge lines must be recognized as a spill. The Initial Action Plan must be initiated and the spill reported through the On-Scene Co-ordinator.

On Land

andBlock entry into waterways and runoff channels.<br/>Do not flush into ditches or drainage systems.<br/>Contain spill by diking with earth or other barrier.<br/>Consider installation of a silt curtain or fence if runoff is occurring at the spill site.<br/>Remove contained liquid fraction with pumps and pump back into processed<br/>kimberlite pond.<br/>Remove the solid fraction manually.<br/>Minimize damage caused by personnel or equipment.<br/>Dispose of solid fractions into the processed kimberlite dam.

On Water Construct a coffer dam or sediment trap to contain released material. A silt curtain or fence may be useful to minimize turbidity, depending on topography. Turbidity can harm fish or fish habitat.

Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

#### Appendix 21.0 Spill Response – Raw Sewage

Consider action only if safety permits!

On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth or other barrier. Remove spills with pumps or vacuum equipment. On tundra, use peat moss and leave in place to degrade, if feasible.
On Snow Blo & Ice	ck entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove contaminated snow with shovels or mechanical equipment.
<b>On Muskeg</b> Do	not deploy personnel and equipment on marsh or vegetation. Remove pooled sewage with pumps or vacuum equipment. Leave in place if more damage will result from cleanup. Minimize damage caused by equipment and personnel.
On Water	Sewage sinks and mixes with water. Isolate/confine spill by damming or diversion. If not possible to confine and pump, disperse using water flushing.
Storage & Transfer Av	Store closed labelled containers in cool, ventilated areas. oid contact with collected material.
Disposal	Consider using as a fertilizer in designated areas. Place into marked containers. Transport to the designated sewage treatment plant.
	Consult BHP Billiton Superintendent – Environment Operations for any po

Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 22.0 Spill Response – Soda Ash

Soda ash (sodium carbonate) is a non-flammable white powder. It is an eye, skin and respiratory tract irritant. Avoid ingestion!

On Land	Do not flush into ditches or drainage systems. Block entry into waterways. Prevent contact with water. Contain spill by diking with earth or other barrier. If soda ash contacts water, confine to as small an area as possible. On dry surfaces, shovel soda ash into containers. On tundra, shovel into containers, if feasible to do so.
On Snow & Ice	Block entry into water; dike using snow or other barrier. Remove soda ash with shovels or other mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove soda ash with shovels or other mechanical means, if feasible. Burning is not a response option. Minimize damage caused by equipment and personnel.
On Water	Soda ash mixes with water (17%) and is difficult to recover. Isolate and confine spill by damming or diversion. Water flushing can be tried to disperse spill.
Storage & Transfer	Place collected material in waterproof containers. Store soda ash in closed labelled containers in cool, ventilated areas away from incompatible materials (lime). Do not heat.
Disposal	Segregate waste types. Keep away from lime. Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 23.0 Spill Response – Sodium Bicarbonate

Consider action only if safety permits!	
	Sodium bicarbonate (baking soda) is a non-flammable white powder.
	It can be an eye, skin and respiratory tract irritant. Avoid ingestion!
On Land	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with earth, sand or other barrier. Remove spills of solids with shovels or mechanically. Remove spills of dissolved materials with universal sorbent, pumps or vacuum equipment.
On Snow & Ice	Block entry into waterways. Do not flush into ditches or drainage systems. Contain spill by diking with snow or other barrier. Remove spills with shovels or my mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove pooled baking soda solution with pumps. Burning is not feasible. Minimize damage caused by equipment and excavation. Low pressure water flushing can be tried, if feasible.
On Water	Baking soda sinks and mixes with water. Isolate/confine spill by damming or diversion. Water flushing can be tried to disperse material.
Storage & Transfer	Store closed, labelled containers in cool, ventilated areas away from incompatible materials, e.g., acids.
Disposal	Segregate waste types. Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 24.0 Spill Response – Sodium Formate

Sodium formate is a highly soluble, white powder or granules. Mechanically collect spills if safe to do so.

On Land	Do not flush into ditches or drainage systems. Block entry into waterways. Prevent contact with water. Contain spill by diking with earth or other barrier. If sodium formate contacts water, try to confine to small area. On dry surfaces, shovel sodium formate into containers. On tundra, shovel into containers, if feasible to do so.
On Snow & Ice	Block entry into water; dike using snow or other barrier. Remove sodium formate with shovels or other mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove sodium formate with shovels, other mechanical means. Minimize damage caused by equipment and personnel. Burning is not a response option.
On Water	Sodium formate mixes with water and is difficult to recover. Isolate and confine spill by damming or diversion. Water flushing can be tried to disperse spill.
Storage & Transfer	Place collected material in waterproof containers. Store closed, labelled containers in cool, ventilated areas away from incompatible materials, e.g., acids (toxic fumes can form).
Disposal	Segregate waste types. Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

## Appendix 25.0 Spill Response – Sodium Hypochlorite 12%

#### When heated or when contacted by acids, may emit toxic fumes!

On Land	Block entry into waterways. Contain spill by dyking with earth, sand or other barrier. Remove spills with vacuum truck if product is still usable. Dilute remaining product with plenty of water.
On Snow & Ice	Block entry into waterways. Contain spill by dyking with earth, sand or other barrier. Remove spills with vacuum truck if product is still usable. Dilute remaining product with plenty of water.
On Muskeg	Flush area with plenty of water.
On Water	It is completely soluble so difficult to contain. Dilute with plenty of water if spill is in a small water body or slow moving stream.
Storage & Transfer	Store in well ventilated, cool, dark areas away from fire hazards, acids and oxidizing materials. Use vented caps. Avoid contact with clothes or any body parts.
Disposal	Dilute with large volumes of water and release to the environment if permitted by regulators. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

#### Appendix 26.0 Spill Response – Sodium Nitrate

Consider action only if safety permits!

Eliminate ignition sources. Stop source if safe to do so. On Land Do not flush into ditches or drainage systems. Block entry into waterways. Prevent contact with water. Contain spill by diking with earth or other barrier. If sodium nitrite contacts water, confine to as small an area as possible. On dry surfaces, shovel sodium nitrite into containers. On tundra, use peat moss and leave to degrade, if feasible to do so. **On Snow** Block entry into water; dike using snow or other barrier. Remove sodium nitrite with shovels or other mechanical means. & Ice On Muskeg Do not deploy personnel and equipment on marsh or vegetation. Remove sodium nitrite with shovels or other mechanical means if feasible to do so. Burning is not a feasible response option. Minimize damage caused by equipment and personnel. **On Water** Sodium nitrite mixes with water and is difficult to recover. Isolate and confine spill by damming or diversion. Water flushing can be tried to disperse spill. Place collected material in waterproof containers. Storage & Transfer Store in closed, labelled containers in cool, ventilated areas away from incompatible materials. Disposal Segregate waste types. Place contaminated materials into marked containers. Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.

#### Appendix 27.0 Spill Response – Sodium Thiocyanate

Consider action only if safety permits! If ignited, sodium thiocyanate forms highly toxic vapours!

	Eliminate ignition sources. Stop source if safe to do so.
On Land	Do not flush into ditches or drainage systems. Block entry into waterways. Prevent contact with water. Contain spill by diking with earth or other barrier. If sodium thiocyanate contacts water, confine to as small an area as possible. On dry surfaces, shovel sodium thiocyanate into containers. Do not leave any residue on land.
On Snow & Ice	Block entry into water; dike using snow or other barrier. Remove sodium thiocyanate with shovels or other mechanical means.
On Muskeg	Do not deploy personnel and equipment on marsh or vegetation. Remove sodium thiocyanate with shovels or other mechanical means. <b>Burning is highly dangerous</b> and should not be attempted. Minimize damage caused by equipment and personnel.
On Water	Sodium thiocyanate mixes with water and is difficult to recover. Isolate and confine spill by damming or diversion. Water flushing can be tried to disperse spill.
Storage & Transfer	Place collected material in waterproof containers. Store closed labelled containers in cool, ventilated areas away from incompatible materials.
Disposal	Segregate waste types. Place contaminated materials into marked containers.
	Consult BHP Billiton Superintendent – Environment Operations for any post spill requirements.