

SUBMISSION TO THE
INUVIALUIT ENVIRONMENTAL IMPACT SCREENING COMMITTEE

MGM ENERGY CORP.
CUTTINGS AND FLUIDS INJECTION FACILITY AT
APUT C-43, WINTER 2008-2011

PREPARED BY:
MGM ENERGY CORP.
CALGARY, ALBERTA

- AND -

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INUVIK, NORTHWEST TERRITORIES AND CALGARY, ALBERTA

MAY 2008
1035057.06



KAVIK-AXYS Inc.

Executive Summary

What is the Proposed Project?

Components	MGM Energy Corp. (MGM) is applying to establish a cuttings and fluids injection facility at Aput C-43. MGM has received approval to drill several wells from 2008 to 2011 and MGM will be using this facility as an alternative to the use of sumps and long haul transportation.
Location	The Project is located on Crown land on Ellice Island in the outer Mackenzie Delta in the Inuvialuit Settlement Region (ISR).
Proponent	MGM Energy Corp.

Why was an Assessment Done?

Environmental Impact Screening Committee	The Environmental Impact Screening Committee (EISC) screens development activities proposed for the Inuvialuit Settlement Region for effects that may negatively affect the Inuvialuit or the environment.
Other Agencies	To adhere to all legislation that is relevant to the success of the Project, a number of permits will be required. These include: INAC Land Use Permit; Approval to alter condition of a well from the NEB; Northwest Territories Water Board Water Licence; Highway Access Permit from the Northwest Territories Department of Transportation; and a Canada Benefits Plan from INAC.

How was the Public Involved?

Purpose of Consultation	MGM conducted public consultation with communities, local organizations and government agencies potentially affected by the Project in February and April 2008. MGM shared information with these groups to obtain community feedback, identify concerns as early as possible, and to gain community feedback and local knowledge about the Project area.
Meetings and Correspondence	Meetings to discuss the proposed Project were held with the Tuktoyaktuk, Inuvik and Aklavik Hunters and Trappers Committees, Community Corporations, Elders Committees and the public. Section 10 summarizes issues and responses; Appendix C presents complete consultation results.

What was Assessed?

Focus of Assessment	Taking into account traditional and current knowledge of the Project area, proposed Project components and issues raised by the communities, the assessment focused on potential effects on the following components: air quality; terrain, soils and permafrost; hydrology and water quality; aquatic resources; vegetation; wildlife; and cultural and heritage resources.
Project Effects	Given the Project scope, Project design features and proposed mitigation, effects to the following valued components were determined. Terrain and vegetation communities are expected to be medium to long-term, infrequent, localized, reversible and result in negligible residual environmental effects. Polar bear, water quality and fish and fish habitat are expected to be short term, localized, reversible and negligible in magnitude.
Cumulative Effects	As detailed in Section 12 of this Project Description, it is considered there is negligible potential for residual Project specific effects after mitigation measures are applied. Therefore the Project is considered to present negligible potential to contribute to cumulative effects of industrial activity in the Mackenzie Delta (Section 13).

Did the Assessment Find Anything of Concern?

The assessment of potential effects on the environment and renewable resource harvesting did not identify any effects of significant concerns on VCs. The following table summarizes the results of the assessment.

Potential Effects on Valued Components	Mitigation
Terrain, Soil and Permafrost	
Shoreline/lowland disturbance and erosion <ul style="list-style-type: none">CFI facility has potential to disturb underlying soils through vehicle and equipment use.	<ul style="list-style-type: none">Ice pads will be constructed using low ground pressure vehicles.Only low ground pressure equipment will be used if there is less than 15 cm of snow.Other vehicles and equipment will only be used on constructed ice pads a minimum of 15 cm thickRutting will be avoided. Vehicle movements will be suspended if rutting occurs.Mushroom shoes or boots will be used on bladed equipment.
Reduced permafrost integrity <ul style="list-style-type: none">Spills.	<ul style="list-style-type: none">If ground disturbance is unavoidable (e.g., in the course of spill clean-up), the surface will be immediately reinsulated using uncontaminated cut vegetation and disturbed soil.

Potential Effects on Valued Components	Mitigation
Water Quality	
Potential effects to surface water quality <ul style="list-style-type: none"> • Surface disturbance and erosion 	<ul style="list-style-type: none"> • All terrestrial Project activities (CFI facility) will take place on constructed ice pads which will facilitate thorough clean up of any accidental spills and protect soils from erosion and contamination, which could subsequently affect surface water quality.
<ul style="list-style-type: none"> • Hydrocarbon spills 	<ul style="list-style-type: none"> • Fuel containment and handling procedures (Section 5.3.2.2, 5.4) will minimize the risk of fuel spills. • Ice pads at the CFI facility will facilitate containment and effective clean-up of any accidental spills of deleterious materials. • In the event of accidental spills, MGM's Emergency Response and Spill Contingency Plan (Section 14 and Appendix E) will ensure containment, thorough clean-up and proper disposal of absorbent materials and contaminated snow and ice. • Prior to site abandonment, all working areas will be inspected for contaminant residues and cleaned up as required.
<ul style="list-style-type: none"> • Drill cuttings and fluid spills 	<ul style="list-style-type: none"> • Drill cuttings and fluids will be trucked to the CFI facility. • A bermed storage ice pad will be developed at the CFI facility for material storage prior to injection. The site will be capable of holding 110% of the largest volume of liquid material stored.
<ul style="list-style-type: none"> • Untreated wastewater releases 	<ul style="list-style-type: none"> • All wastewater will be treated in approved facilities designed for proper containment and treatment. • Treated wastewater will be disposed of in accordance with permit requirements. • Ice pad at the CFI facility will facilitate containment and effective clean-up of any accidental spills of untreated wastewater.
Fish and Fish Habitat	
Potential fish entrainment and mortality <ul style="list-style-type: none"> • Water withdrawal using pumps and hoses (necessary to make ice pads) may result in fish kills 	<ul style="list-style-type: none"> • Suction hoses and screens used for water withdrawal will be designed and operated in accordance with DFO <i>Freshwater Intake End-of-pipe Fish Screen Guidelines</i> (DFO 1995). • Regular inspection of water trucks to ensure compliance. • Mitigation for water quality listed above will protect fish and fish habitat.

Potential Effects on Valued Components	Mitigation
Vegetation Communities (Including Rare Plants)	
Localized loss or damage of vegetation <ul style="list-style-type: none"> • Damage to vegetation from ground disturbance • Damage to vegetation from accidental spills • Compaction and effects of delayed melting associated with ice pad 	<ul style="list-style-type: none"> • Operations on land will be confined to winter (frozen ground) conditions. • No rare plants or communities were identified at the site. • Where vegetation removal or damage is necessary, e.g., in the case of spill clean-up, the area will be reinsulated with cut organic matter to prevent possible melting of permafrost and facilitate re-vegetation during final site clean-up and reclamation. • The areal extent of on-land ice pad footprints will be minimized.
Polar Bears	
Disturbance of denning bears <ul style="list-style-type: none"> • Direct disturbance during construction and operations • Sensory disturbance during construction and operations 	<ul style="list-style-type: none"> • MGM will incorporate the results of ENR identified den location information into the Project. • IGC and CWS air traffic guidelines will be followed, where possible. • Wildlife monitors will be present and consulted during activities.
Disturbance of foraging bears <ul style="list-style-type: none"> • Sensory disturbance during construction and operations • Sensory disturbance from reconnaissance flights 	<ul style="list-style-type: none"> • Bear overflight guidelines will be determined through consultation with ENR. • Wildlife monitors will be employed and consulted during activities.
Bear-human interactions <ul style="list-style-type: none"> • Attractants from camps and worksites • Safety 	<ul style="list-style-type: none"> • ENR <i>Bear Encounter Response Guidelines for Oil and Gas Programs</i> will be followed (ENR 2005; Appendix F). MGM has also developed a Bear Protocol to mitigate bear-human interactions, including training, garbage management and monitoring. • Wildlife monitors will be used to monitor bear activity, and to manage bear encounters. Bears will not be harassed.

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Abbreviations

CCME	Canadian Council of Ministers for the Environment
CCP	Community Conservation Plan
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CFI	Cuttings & Fluids Injection
CWS	Canadian Wildlife Service
DFO	Department of Fisheries and Oceans Canada
EISC	Environmental Impact Screening Committee
EL	Exploration Licence
ENR	Department of Environment and Natural Resources
ERP	Emergency Response Plan
ESRF	Environmental Studies Research Fund
H ₂ S	Hydrogen sulphide
HTC	Hunters and Trappers Committee
IGC	Inuvialuit Game Council
INAC	Indian and Northern Affairs Canada
ISR	Inuvialuit Settlement Region
KCl	Potassium chloride
KIBS	Kendall Island Bird Sanctuary
MGM	MGM Energy Corp.
MGP	Mackenzie Gas Project
NEB	National Energy Board
NO ₂	Nitrogen dioxide
NWT	Northwest Territories
PD	Project Description
SARA	<i>Species at Risk Act</i>
SO ₂	Sulphur dioxide
VC	Valued Component

1 Title

MGM Energy Corp. Cuttings & Fluid Injection Facility at Aput C-43

2 Contact Names and Addresses

MGM Energy Corp. (MGM) is applying to establish a Cuttings & Fluid Injection (CFI) facility at the Aput C-43 site (the Project). Table 2-1 outlines the contact names and addresses for the Project.

Table 2-1 Contact Name and Address

Main Program Contact
Glenn Miller General Manager, Regulatory & Community Affairs MGM Energy Corp. Suite 4100, 350 7 th Avenue Calgary, Alberta T2P 3N9
Phone: (403) 781-7800 (general) Phone: (403) 781-7832 (direct) Fax: (403) 781-7801 Email: glenn.miller@mgmenergy.com

3 Regulatory Approvals

MGM is submitting this Project Description (PD) for screening by the Environmental Impact Screening Committee (EISC) under the terms of the *Inuvialuit Final Agreement*. The Project consists of the annual installation and operation of a winter-only CFI facility located at Aput C-43.

Approvals required for this Project are listed in Table 3-1. MGM will contact the appropriate authorities and make applications for the required permits and licences.

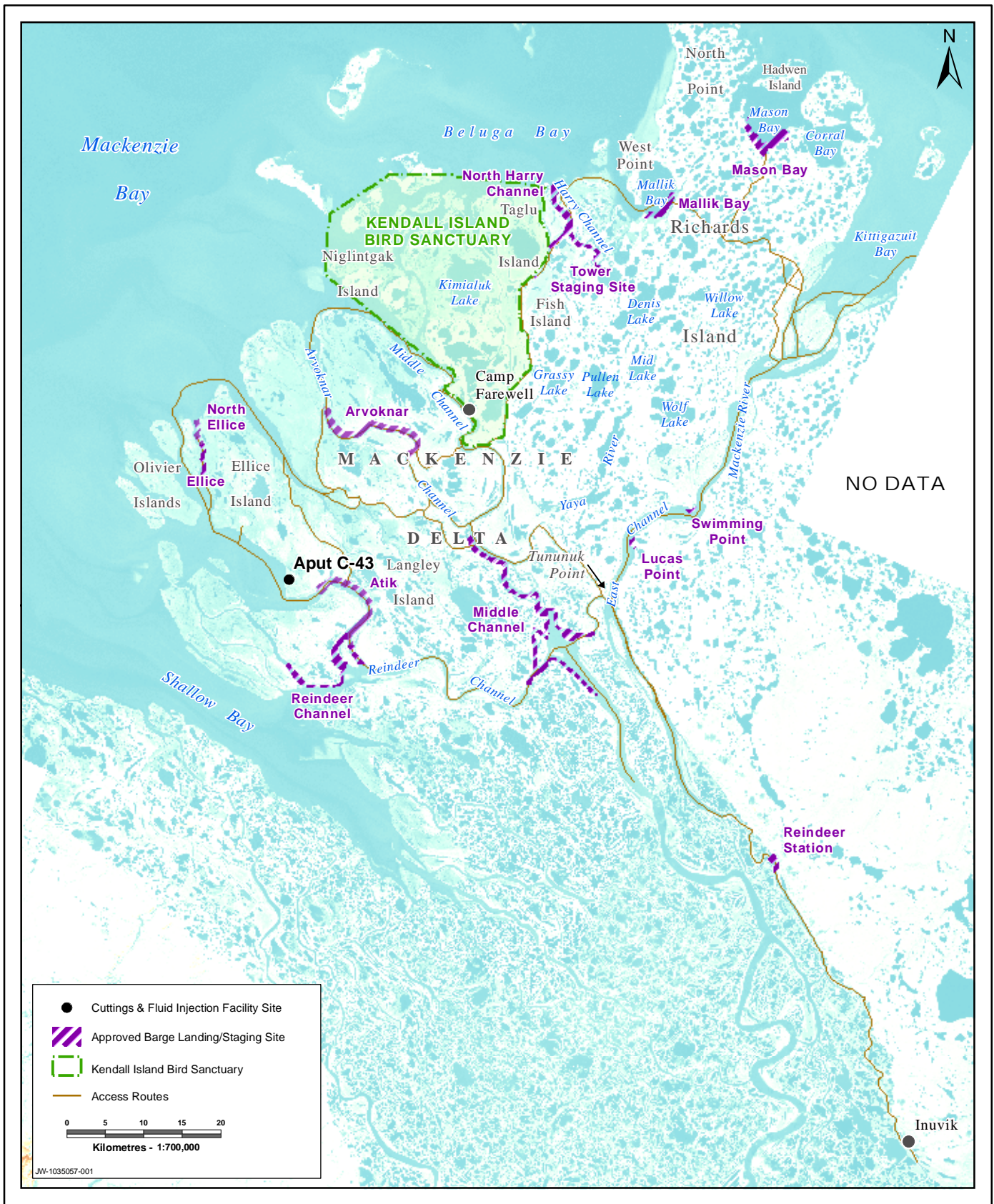
Table 3-1 Approvals Required for the Proposed CFI Facility at Aput C-43

Agency and Contact Person	Approval Required
Barb Chalmers Environmental Assessment Coordinator Environmental Impact Screening Committee P.O. Box 2120 Inuvik, NT X0E 0T0	Approval of Project Description ¹ <i>Inuvialuit Final Agreement</i>
Rudy Cockney NWT Water Board 2 nd Floor Goga Cho Building 4920 – 52 nd Street Yellowknife, NT X1A 2R3	Water Licence <i>NWT Waters Act</i> <i>NWT Water Regulations</i>
Conrad Baetz District Manager, North Mackenzie District Indian and Northern Affairs Canada P.O. Box 2100 Inuvik, NT X0E 0T0	Land Use Permit(s) ² <i>Territorial Lands Act</i> <i>Territorial Land Use Regulations</i> <i>Canadian Environmental Assessment Act</i>
Angela Norris Petroleum Development Manager (Acting) Indian and Northern Affairs Petroleum Development Division PO box 1500 Yellowknife, NT X1A 2R3	Canada Benefits Plan <i>Canada Oil & Gas Operations Act</i>
John Suwala Assistant Director, Highway Operations Highways Division Department of Transportation (DOT) 76 Capital Drive, Suite 201 Hay River, NT X0E 1G2	Permit for Temporary Access to a Public Highway <i>Public Highways Act</i> (if required)
Bharat Dixit Chief Conservation Officer National Energy Board 444-7 Avenue S.W. Calgary, Alberta T2P 0X8	Approval to Alter Condition of a Well <i>Canada Oil and Gas Operations Act</i> <i>Canadian Environmental Assessment Act</i>
NOTES: ¹ The proposed Aput well (Figure 4-1) has been previously successfully screened. ² Permits are issued for a two-year term, with a possibility for a one year extension.	

4 Location

The Project consists of the recompletion of the existing Aput C-43 well and the establishment of a winter only CFI facility. Aput C-43 is located on the southwest corner of Ellice Island (Figure 4-1) and was previously drilled in the winter of 2007/2008 by MGM Energy Corp.

The Aput site is approximately 109 km from Inuvik, 93 km from Aklavik and 116 km from Tuktoyaktuk.



CUTTINGS & FLUID INJECTION FACILITY AT APUT C-43

Program Location Regional Overview

Imagery Source: Her Majesty in Right of Canada. Department of Natural Resources

PREPARED BY	KAVIK-AXYS Inc.
PREPARED FOR	mgm ENERGY CORP.
FIGURE NO.	4-1

5 Development Summary

This section describes the purpose, overall scope, key components, transportation support and infrastructure, schedule and personnel requirements for the proposed Project.

5.1 Purpose of the Project

The purpose of the Project is to establish a CFI facility for drill cuttings and fluids injection at Aput C-43. MGM has received approval to drill several wells from 2008 to 2011 and MGM will be using this CFI as an alternative to the use of sumps and long haul transportation.

CFI is a proven technology and an effective solution for the handling of drill cuttings and fluids. This is a means to return the cuttings to its underground environment. Management techniques that result in no on-site surface disposal are an attractive alternative to other treatment and handling methods such as in-ground sumps or trucking the cuttings & fluids long distances to treatment facilities.

5.2 Project Scope

The CFI facility will initially be developed to support MGM's drilling programs from 2008 to 2011. Mobilization and demobilization of equipment and the development of transportation connectivity between MGM operations (equipment landing and staging sites, well sites and ice roads) have either been approved or are currently being reviewed by the EISC under separate cover. The Project scope for the CFI facility includes:

1. mobilization of equipment to the Project area
2. annual construction and equipment installation of the CFI facility at the Aput C-43 site
3. wellbore recompletion in preparation for injection
4. operation of the CFI facility to inject drill cuttings and fluid from MGM wells
5. demobilization of CFI facility equipment between drilling seasons
6. inspection and monitoring

Subsequent sections of this PD describe activities that will occur in each of the three years of the Project. As activities are likely to be conducted in a similar manner from one year to the next, the sections apply to each year of the Project, unless specified. Note: Injection activity in any year will occur only if drilling takes place.

5.3 Project Activities

There are six main activities associated with this Project: Mobilization, Construction, Recompletion, Operations, Demobilization and Inspection and Monitoring of the CFI facility. A detailed description of each of these activities can be found in sections 5.3.1 to 5.3.6.

5.3.1 Mobilization

Equipment transported to the Project area to support the construction and operation of the CFI facility includes site construction equipment, rig equipment for wellbore recompletion equipment, injection equipment, support vehicles, fuel storage containers, and camp facilities.

The mobilization of equipment to the CFI facility site will follow ice roads developed in support of MGM's drilling operations. The following information is provided for reference only and is part of the advance barge and staging, and drilling project descriptions and approvals have been previously screened by the EISC.

MGM is considering four options for staging and mobilization:

- advance staging of equipment and fuel on barges and freezing in at barge landing sites or staging sites (for details of barge mobilization, see Summer Project PDs)
- barges carrying equipment, materials and fuel will travel to the staging area and offloaded, then return to their place of origin
- mobilization of equipment and fuel by truck to the Project area
- a combination of these options

Advance barging of equipment has been previously screened and approved by the EISC under the separate cover of *MGM Energy Corp. 2007, 2008 and 2009 Summer Field Assessment and Advance Barge Project* and as part of the *Summer Field Assessment, Advance Barge and Staging Project: 2008-2011*.

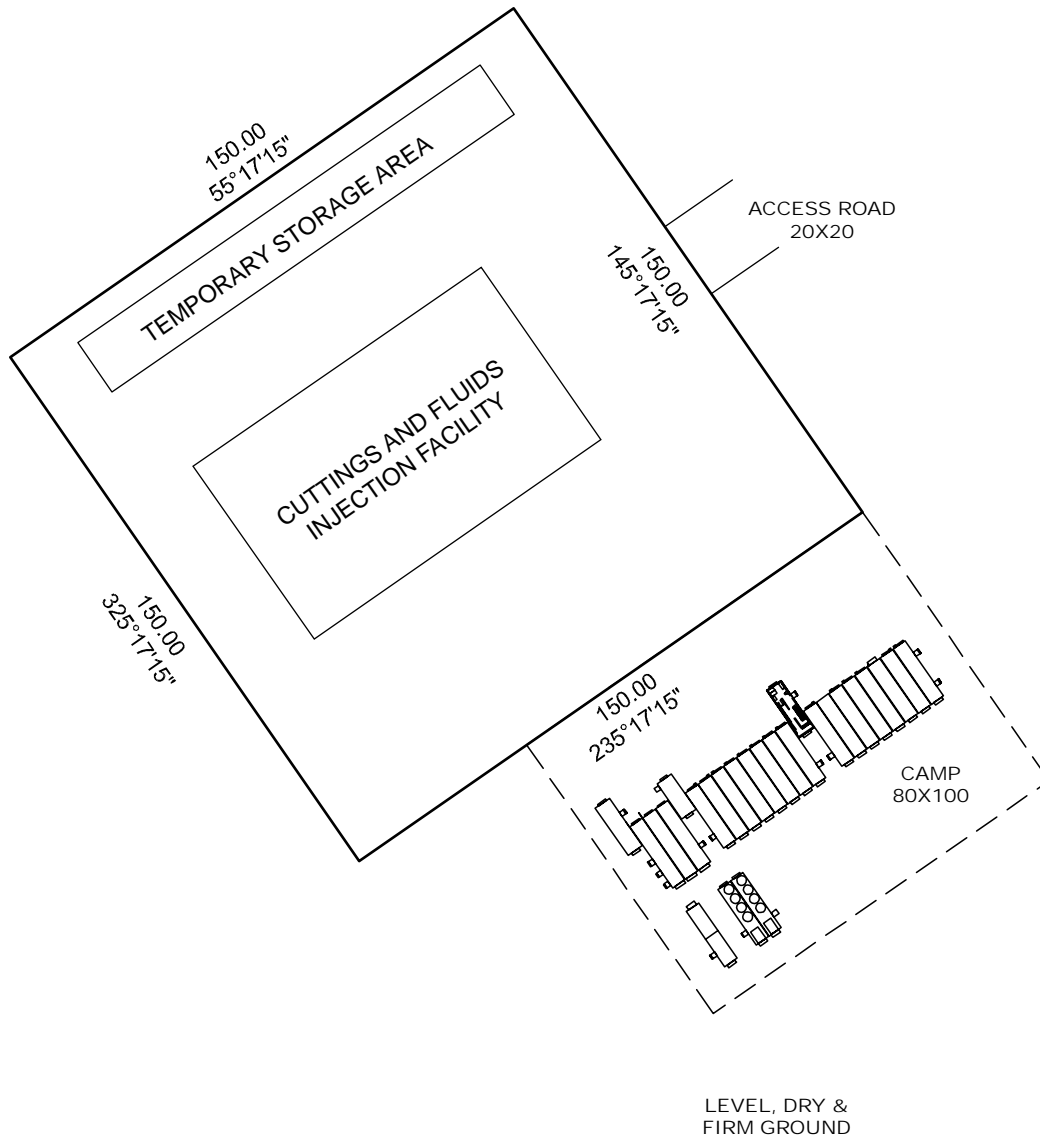
If trucking is employed, MGM will mobilize equipment and fuel by ice road from permanent land bases (e.g., Inuvik). If this option is selected, mobilization will take place once ice roads can be constructed from the Inuvik to Tuktoyaktuk Government ice road to the active drill sites then to the Aput C-43 site. Trucking of equipment to the Project area has been previously screened and approved by the EISC under the separate cover of *MGM Energy Corp. Ellice, Langley and Olivier Drilling, Completion and Testing Project Winters 2007-2008, 2008-2009 and 2009-2010* and *MGM Energy Corp. West Delta Winter Drilling, Completions and Testing Project 2008-2009*.

5.3.2 Construction

Construction activities include the construction of the ice pad and the installation of the CFI facility. Construction activities will be coordinated with drilling projects that the CFI facility is supporting, including transportation links between barge landing/staging sites, drilling locations and the Aput C-43 site.

5.3.2.1 CFI Facility Site

The CFI facility site will be constructed on a former wellsite with an ice pad having a minimum thickness of 15 cm, providing sufficient thickness for protection of underlying vegetation and to prevent permafrost degradation. If required, snow may be collected using snow fences and/or gathered from the surface of adjacent frozen waterbodies. There will be no ground disturbance and the site will be levelled using snow and ice during ice pad construction. Low ground pressure vehicles will pack snow in the ice pad area. Water trucks fitted with a spray bar will apply water to the packed snow, building ice to the desired thickness.



MGM ENERGY CORP.
MACKENZIE DELTA, N.W.T.

AREAS

CFI Facility Site = 2.25 ha.
TOTAL AREA = 7.11 ha.

NOTE: TYPICAL SITE LAYOUT MAY VARY
SLIGHTLY BASED ON SITE CONDITIONS.

CUTTINGS AND FLUID INJECTION FACILITY
2008-2011

**Typical CFI Facility
Site Schematic**



KAVIK-AXYS

DATE	May 2008
PROJECT	1035057
SCALE	1:1,500

FIGURE NO.

5-1

Up to 40 personnel may be required during the construction & installation of the CFI facility. Personnel may be accommodated at various locations, depending on the order of the wells drilled and the timing of CFI facility construction & installation. It is likely that the construction crew will be located first at the barge landing site to commence ice road construction to the first wellsite, then commence construction of the access road from the drill sites to the CFI facility site. A temporary construction camp may be set-up at the CFI facility or construction personnel may travel between the CFI facility site and an active drill or barge site for each shift depending on the location of the drill project construction camp.

Air support may be required to mobilize construction crews to construction sites and to provide emergency evacuation, crew changes, and transportation of consumables and other supplies to the proposed location. Initial mobilization will be by helicopter followed with a landing strip for fixed wing aircraft. A designated helicopter and/or fixed wing landing area will be established near the CFI facility.

The ice pad will be approximately 4 ha in area (including CFI facility pad, camp, fuel storage area and temporary drilling cuttings & fluid storage area), with an additional 26 ha of snowbelt. The snowbelt will provide protection to the site from excessive drifting, while offering a supply of snow if required for re-insulation or additional construction. Figure 5-1 illustrates a generic injection facility site layout. The main components of the CFI facility site are:

- **CFI Facility Pad** – The CFI facility pad is defined as the work area for the rig and associated slurry and injection equipment, etc. The ice pad for the CFI facility is approximately 150 m x 150 m. At this time, a rig has not been contracted for the recompletion operations; however, the rig will likely have a footprint of approximately 1000 m² and a total weight of roughly 300 tonnes.
- **Camp** – The ice pad for the camp will be located at, or immediately adjacent to, the CFI facility, and will be approximately 2 ha (Figure 5-1). The camp will accommodate up to 40 people. Once the CFI facility is operational, personnel may be accommodated at the CFI facility site or at a camp associated with the drilling/completion operations, leaving office & survival shacks at the CFI facility.
- **Temporary Storage Area** – As it is trucked to the facility location, drill cuttings will be stored in a bermed ice “Temporary Storage Area (TSA)” as was done in 2007-2008 or in tanks. Tanks located on the CFI facility site will be used to contain fluids and may be used to contain cuttings. It is estimated that the cuttings area will be approx 120 m x 15 m to accommodate six 70,000L heated tanks for fluids (i.e., water and mud)
- **Fuel storage** – the Fuel will be stored on the CFI facility in tanks with built in or constructed secondary containment, to contain any spilled fluids in the event of an incident up to a maximum of 110% of the volume of the largest container.
- **Snowbelt** – A minimum 50 m wide snowbelt will surround the CFI facility site ice pad and access road. The snowbelt will be designed to prevent the accumulation of snow on the pad, thereby minimizing drifting in the working areas. The snowbelt will also be used for deposition of clean snow removed from the CFI facility site and camp after storms and heavy snowfalls. Only low ground pressure vehicles will be used to move snow within the snowbelt

5.3.2.2 Fuel Storage and Re-fuelling

Fuel for the Project is approved under MGM's drilling projects. Fuel to support construction activities will be stored in tanks with built-in or constructed secondary containment. Specifically-trained individuals will be tasked with transportation of fuel and re-fuelling during the construction operations to ensure consistency of re-fuelling procedures and to minimize potential spills. Drip pans will be used when vehicles are being fuelled or when stationary for more than two hours. The fuel truck will also be equipped with an emergency spill kit.

5.3.3 Recompletion

The Aput C-43 well has been drilled and is in a condition where the wellbore can be converted to an injection well. The existing well is lined with steel casing past the injection zone and the outside of the casing has been cemented to the surface. This approach will seal off the injected cuttings & fluid from the formations above the injection zone to the surface.

A rig will be required for approximately 2 weeks during the first year to recomplete the well and to prepare it for injection. While the use of a service rig is anticipated, a drilling rig may be used depending on equipment availability.

Recompletion activity will include re-entering the wellbore and perforating the steel casing at approximately 1400 m (the injection zone) so the cuttings and fluid slurry can be injected. The cuttings and fluid will be injected through injection tubing inside the casing and through the casing perforations. Once the recompletion is done, the injection equipment will be installed and injection will commence.

5.3.4 Operations

5.3.4.1 Site Selection

The Aput C-43 contains an existing wellbore, is classified as a “dry” well and will not be used for future gas production. As such, the well was identified as a possible candidate for a CFI facility. Evaluation of the Aput C-43 well and associated reservoir rock found the site to be ideal for a CFI facility. The reservoir formations suitable for injection are located between 1036 m and 1400 m below the surface (Figure 5-2). The C-43 site also has an impermeable “cap rock” formation above the zone of injection to further prevent the risk of migration of the injected material to the surface.

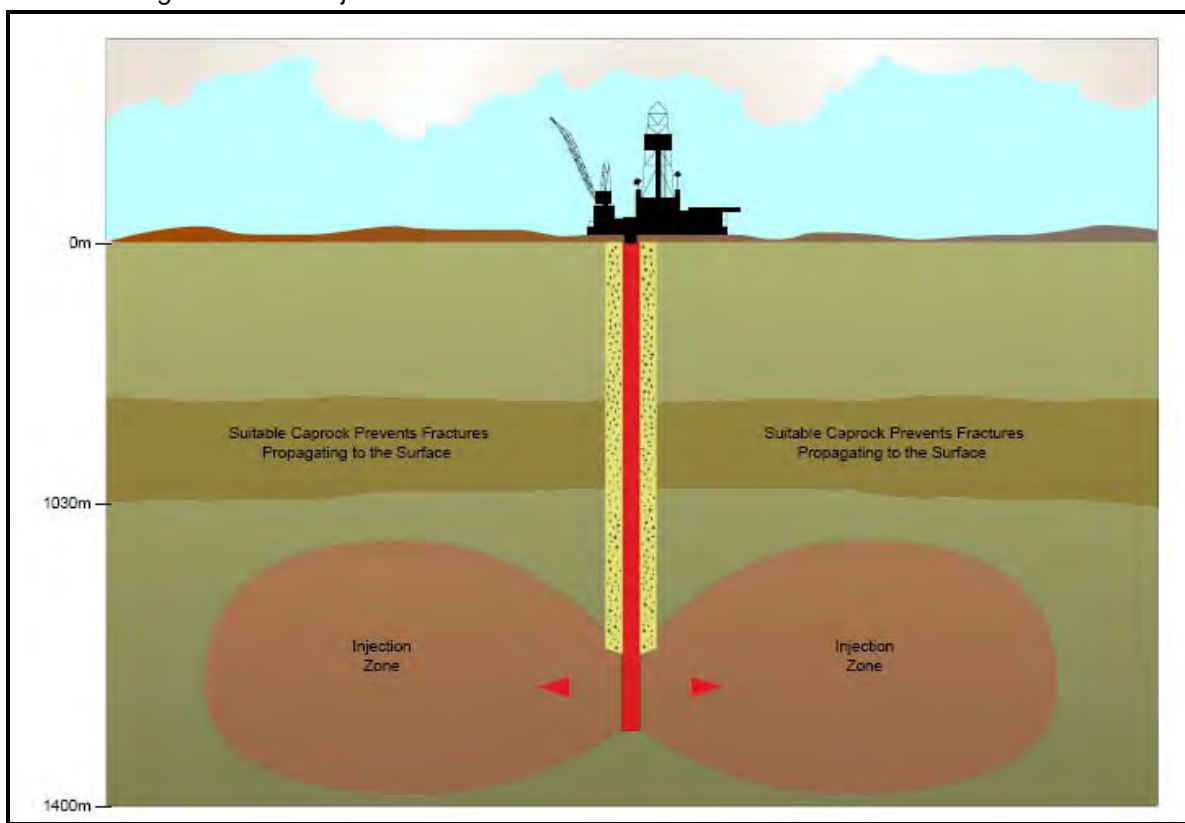


Figure 5-2 Depiction of a Typical Injection Well

5.3.4.2 Transportation of Cuttings & Fluids

MGM will develop ice road connectivity between its drilling operations and the CFI facility in each year of operation. Proposed ice roads to accommodate transportation links between sites have been approved by the EISC and are shown on Figure 4-1.

Drill cuttings & fluids will be transported to the CFI facility by truck.

5.3.4.3 Slurry and Injection

Injection materials must meet a certain viscosity suitable for injection. Drill cuttings and other materials must be slurried until this viscosity is achieved. Materials to be processed are fed into the feed hopper, either by an auger, belt or pneumatic system, front end loader or even a vacuum truck. The cuttings and fluid then go either over a classification shaker to remove oversized particles or directly into the mixing tank of the slurry unit where the slurry is generated.

Once the cuttings are inside the slurry unit, it is processed through the circulating pumps, which substantially reduce the cuttings particle size. Water, drilling mud, and/or viscosity polymers can be added to adjust the slurry properties. In general, a 1 to 5 ratio of solids to fluid is needed to achieve the required viscosity. Particle suspension is maintained by means of an agitator and the slurry pump discharge nozzles. When the slurry is processed to the desired weight and viscosity it is transferred to the classifier shaker where oversized particles are separated from the slurry and collected in the coarse tank for further processing. The acceptable slurry passes through the shale shaker into the fine tank, which has an agitator to maintain particle suspension and homogenous slurry. The slurry is then suitable for injection into the well and is stored in the batch holding tank.

From the batch holding tank, the slurry is pumped via a supercharging pump to a variable speed triplex injection pump, and injected into the recipient underground formation, while monitoring injection pressures into the injection well. Each batch consists of approximately 94 m³ of slurry which is injected into the formation at a maximum rate of 0.64 m³ per minute. Each batch of slurry is processed and injected over an 8 hour period. For quality assurance, the slurry density and viscosity is measured and tabulated on a per batch basis. Figure 5-3 depicts a moderate sized injection operation.

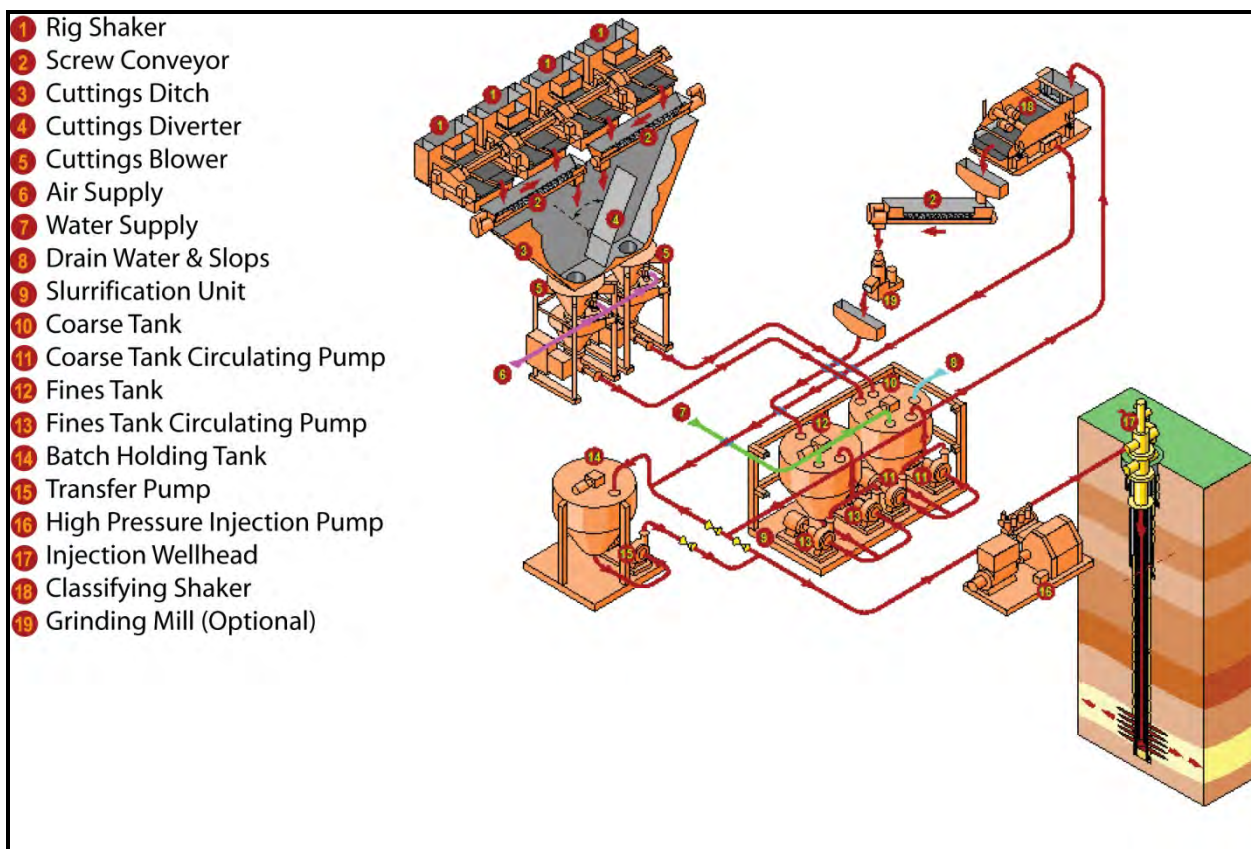


Figure 5-3 Layout of a Typical Moderate Sized Cuttings and Fluid Injection Facility

MGM estimates drill cuttings for shallow wells will total 300 m³ per well with deep wells accumulating 450 m³ to 600 m³ of cuttings. In addition, 500 m³ to 1500 m³ of drilling mud per rig may be required for injection. It is anticipated that the CFI facility will operate through the drill season.

5.3.4.4 Air Support during Operations

Helicopter and fixed wing flights will be required to support Project activities, or for medivac purposes. Most flights will originate from Inuvik, or other supply sources.

Defined flight paths will be maintained throughout the Project and will be straight lines unless deviations are needed to re-fuel, avoid weather conditions, or avoid sensitive areas, such as harvesting areas or wildlife concentrations. The 2002 Inuvialuit Game Council (IGC) Overflight Guidelines (IGC 2002; Appendix A) will be adhered to when safely possible.

5.3.5 Decommissioning and Demobilization

5.3.5.1 Well Suspension/Abandonment

The well will be suspended between operating seasons and ultimately abandoned according to National Energy Board (NEB) requirements.

At the end of each season's injection, the well will be secured in compliance with National Energy Board regulations which may include a steel plug set in the wellhead, wellhead valves shut and chained, and plugs set in the valve openings, providing several levels of wellbore containment.

5.3.5.2 Initial Site Clean-Up

The CFI facility site, access roads, camp site and fuel storage site will be inspected for spills as equipment is removed. All contaminated ice and snow will be removed and may be processed in an evaporator. The hydrocarbon remnants will be trucked to an approved disposal site or processed through the CFI facility subject to NEB approval. Areas of potential effects will be inspected, documented (including GPS coordinates), reported and photographed for further assessment and clean-up as necessary. All equipment, survey stakes and construction debris associated with the operations will be removed. All other materials will be removed from the CFI facility site at the end of the winter season. Any debris remaining at the staging area(s) from demobilization activities will be transported to an approved facility.

5.3.5.3 Demobilization of Equipment

An option for demobilization of equipment and materials is transport by truck to Inuvik, or a staging site. Alternatively, if barges are frozen-in at or near the CFI facility, some equipment may be stored on those barges for removal after break-up. Barges will remain at the mooring sites and will be retrieved by the barge operators following spring break-up.

Barge Removal

The following information is provided for reference only and is part of the drilling project descriptions and approvals have been previously screened by the EISC.

If the work scope of the drilling programs involves freezing barges in over the winter, bi-weekly inspection visits to barges via helicopter will be conducted during the time between land-based demobilization and barge removal. Barge visits may occur daily for approximately one week at spring break-up to monitor the release of barges from the ice.

Though the exact date is not known, barge demobilization will occur following spring break-up (i.e., early June) and would likely follow routes used during placement. Depending on the availability of barges in the region, movement of barges at this time will likely be required to ensure that they are available for use by communities and other operations.

Removal work will be conducted by tugs and will be supported by helicopters. Approximately 20 days will be required to complete barge removal back to permanent bases (includes contingency for weather and equipment problems). Barges will be removed from moorings in groups of two to three. Each barge group removal event will take approximately two days to complete.

Following project completion, the barge mooring bollards will be cut at or below grade then removed if no longer required. Mooring bollards will be removed concurrently with the barges. No reclamation requirements for the barge site(s) are anticipated, although they will be inspected the following summer.

5.3.5.4 Air Support during Demobilization

Where fixed-wing or helicopter flights are required to support demobilization, IGC Overflight Guidelines, as well as CWS recommendations (1000 m vertical distance and 1500 m horizontal distance from concentrations of birds), will be adhered to. Pilots will be briefed on the Project's flight guidelines.

5.3.6 Inspection and Monitoring (including Final Clean-Up)

The Project area will be inspected via helicopter during the summer following the completion of each year of the operation of the CFI facility to ensure all debris has been removed and to assess/identify any residual effects. Activities will be coordinated summer program activities, as discussed in MGM's Summer Project, submitted to the EISC under separate cover. The inspections will take approximately four to six days, and will attempt to target a period of lower sensitivity for migratory birds. Any clean-up work and residual surface disturbance will be addressed as required in consultation with the appropriate regulatory agencies.

5.4 Fuel Storage and Use

Within the CFI facility site, fuel will be stored in association with the drilling rig, the slurry and injection equipment, and additional tanks for general operational use. Fuel storage areas will typically house a 60,000 L diesel tank for the rig. In addition, a 15,000 – 30,000 L double-walled Envirotank will be available for daily re-fuelling operations. Auxiliary tanks will provide fuel storage for a total of approximately seven days fuel supply under normal consumption.

Regular inspections will be completed to ensure tank containment integrity and re-fuelling areas are clean. Any leaks or spills will be cleaned up immediately, be recorded and/or reported, and the cause of leak corrected. Tanks will be transported to the sites empty and dedicated re-fuelling personnel will be used to minimize the risk of incidental re-fuelling spills. Spill kits will also be strategically placed and maintained in and around re-fuelling areas. There are no plans at this time to store aviation fuel at the CFI facility or airstrip. Table 5-1 summarizes fuel storage volumes and locations.

Table 5-1 Project Fuel Storage and Supply

Requirement	Volume of Diesel Fuel (L)	Storage Location	Containment
Operations	70,000 (15,000 L to 30,000 L Envirotank)	CFI Facility	Secondary containment (built in or bermed)
	70,000	Camp(s)	Secondary containment (built in or bermed)

A small quantity of gasoline will be stored to operate snow machines etc. This will be stored in drums. Less than a dozen drums are anticipated. The drums will be stored in the bermed fuel storage site.

5.5 Water Use

Water withdrawals from Mackenzie River, associated channels and other suitable waterbodies will be required for the construction of the ice pad, camp use and make-up water for the CFI facility operations. Fish screens meeting Department of Fisheries and Oceans Canada (DFO) guidelines (DFO 1995) will be used on all suction hoses. Potable water will be treated on site, or supplied from the Town of Inuvik for domestic use in the camp(s). Bottled water may also be provided for consumption purposes (plastic bottles will be kept for disposal or recycling).

Estimated daily water use for the Project, as outlined in Table 5-2, will vary during construction, operations and demobilization. An estimated maximum water requirement of approximately 1500 m³/day is projected. Water will be withdrawn from the Mackenzie River, associated channels or other suitable waterbodies within the Project area.

Biodegradable grease and lubrication will be used on water intake pumps where practical and reasonable.

Table 5-2 Estimated Water Volumes for Project Activities

Activity	Estimated Maximum Daily Volume (m ³)	Estimated Duration of Use (days)	Total Water Volume
Site construction	900	20	18000
Drill Cutting Slurry	300	90	27000
Camp	100	90	9000
Total	n/a	n/a	54000

5.6 Waste Management

5.6.1.1 Wastewater Treatment

The CFI facility will have two 400 barrel (63.6 m³) heated tanks to store wastewater effluent during the start up and testing period (prior to discharge). It is expected that the camp will be outfitted with a membrane filtration wastewater system as used successfully during MGM's 2007-2008 drilling program. Incinoleet toilets (waste incinerator toilets) may be used if supplied with the camp. Technical details of the wastewater treatment systems are provided in Appendix B.

Wastewater, including grey water and sewage, will be processed by the on site wastewater treatment system. Once water quality discharge criteria have been met, treated effluent will be released to land or will be used on ice roads as directed by INAC Land Use Inspectors or the Project Water Licence. All terms and conditions for release as outlined in the Project's Water License and Land Use Permit will be followed.

In the event that the treatment system cannot meet expected licensed performance (discharge) criteria, effluent will be; (1) hauled by vacuum tank truck to the municipal treatment facility in Inuvik (assuming authorization is granted by the Town of Inuvik, and sufficient treatment capacity is available; or (2) taken to the drill camp sewage treatment plant for further treatment and disposal; or (3) processed through the CFI facility subject to appropriate authorization.

If the access route to Inuvik is restricted (e.g., due to poor weather), treated effluent may be frozen and stored, then stored in a bermed ice pad to be hauled to the Inuvik facility as frozen effluent when conditions are more favourable. Alternatively, wastewater may be temporarily stored onsite in the heated tanks.

5.6.1.2 Solid Waste Management

An on site waste segregation system will be used for metals, plastics, refined oils and oily waste. During construction and well recompletion, a standard drill camp will be used. The camps will have a dual-chamber, diesel-fired forced air incinerator. Combustible materials and food wastes will be incinerated onsite on a daily basis. Incinerator ash will be trucked out and disposed of at an appropriate disposal facility. Other industrial and hazardous wastes will be transported south to an approved waste management facilities. Contaminated snow will also be collected and melted and evaporated in a diesel-fired evaporator. Beverage containers will be recycled through local community recycling programs.

5.7 Equipment

Table 5-3 lists equipment required for the Project. This list reflects the best available estimate of equipment needs but will be subject to change with equipment availability. Equipment listed for construction pertains to MGM construction activities as a whole throughout the Mackenzie Delta (see *West Delta Drilling Completions and Testing Project: 2008-2011*, screened and approved by the EISC April 2008).

Table 5-3 Equipment Requirements

Construction	Recompletion	CFI Facility Operation
2 Delta 3s	Service or Drilling rig with matting, truck shop and associated equipment	Cuttings/Solids conveyance system (including grinding, injection and support equipment (see Figure 5-3)
Snow making machine(s)	Pressure testing unit	Side-by-side camp buildings suitable for 40 people
10 trucks (e.g., vacuum, water)	Blowout prevention equipment	
Pick-up trucks	Wireline unit and associated equipment	
2 front end loaders with optional attachments	Side-by-side camp buildings suitable for 40 people	
4 plough/auger trucks		
2 graders complete with wing		
1 trackhoe		
1 rubber-tired backhoe		
2 dump trucks		
4 snow cats		
1 Crane		
1 Picker truck		
Trucks/haulers		

5.8 Personnel Requirements

Personnel requirements will vary during each phase of the Project. Table 5-4 presents a best available estimate of personnel requirements for the construction, operations and demobilization phases of the Project. Personnel listed for construction pertains to MGM construction activities as a whole throughout the Mackenzie Delta (see *West Delta Drilling Completions and Testing Project: 2008-2011*, screened and approved by the EISC April 2008).

Table 5-4 Average Number and Type of Personnel Required by Activity

Construction & Installation	Recompletion	CFI Facility Operation
3 supervisors	16 Rig Crew	10 CFI Facility Operators
20 equipment operators	4 Supervisors (including HSE)	2 Supervisors
2 labourers	6 Associated services staff (i.e., fluid handling)	8 Support Staff
1 mechanic	4 Camp staff	3 Camp Staff
4 camp staff	6 Support Staff	1 HSE Coordinator
1 medic/first aid attendant	1 HSE Coordinator	1 wildlife monitor (as required)
1 HSE Coordinator	1 wildlife monitor (as required)	
1 environmental monitor		
1 wildlife monitor		
Total =34	Total = 38	Total = 25

6 Development Timetable

6.1 Project Schedule and Phases

Table 6-1 illustrates the overall annual schedule for key phases of Project activities and the average duration of ice cover in the Project area. Of the activities listed, some or all may be conducted in winter 2008-2009, 2009-2010 or 2010-2011. Specific Project activities occurring in each phase are described in Section 5.3.

Table 6-1 Approximate Project Schedule

Yearly Schedule												
Program Activities	S	O	N	D	J	F	M	A	M	J	J	A
Mobilization ¹												
• Advance Barging												
• Trucking												
Construction ²												
• CFI facility												
Recompletion												
Operations ²												
Decommissioning												
Equipment Staging ¹												
• Barge Freeze-in Sites												
• Staging Sites												
Demobilization												
• Ice Roads												
• CFI Facility and Equipment												
• Barges ¹												
Inspections/Monitoring												
NOTES: ¹ Approved under separate cover ² Timing of activity is subject to the drilling schedule												

- **Advanced Barge Mobilization** – July to October 15
- **Trucking Mobilization** – mid-November to January, after Inuvik – Tuktoyaktuk Government Road opening
- **Construction of CFI Facility** – late December to February
- **Recompletion** – Two weeks in January
- **Operations** (CFI facility) – February to April
- **Decommissioning** (CFI facility) – April
- **Demobilization** (ice roads) – April
- **Demobilization** (barges) – after spring break-up (June 1 – early July, dependent on barge company)
- **Equipment Staging** – between winter seasons
- **Inspection/Monitoring** – May/June (including final clean-up and reclamation)

7 New Technology

CFI technology has been used in Alaska since the mid eighties. Over the last twenty years, the application and scientific knowledge of this technology has grown extensively. By the early nineties, applications included annular and dedicated well re-injection of drill cuttings and fluids in both long-term offshore developments and mobile land operations including offshore operations in the North Sea and conventional wells in North America, and to a lesser extent in South America, Africa and the Far East.

In its basic form, CFI involves reducing the drill cuttings to a suitable particle size, mixing the cuttings with water and/or other fluids to form pumpable slurry. The slurry is then injected by pumping it down a well into a designated receiving formation.

8 Alternatives

MGM has examined alternatives to elements in the Project with the intention of finding an optimum balance between environmental, social and economic costs and benefits. Results of this evaluation are provided below.

8.1 Alternative Well Locations

For economic reasons the Project should utilize an existing MGM well that has been classified as a “dry” or uneconomical well for gas or oil production.

For technical reasons, injection wells must have the appropriate geological reservoir to provide adequate storage capacity for the anticipated volume of material. The ideal location must also have an impermeable “cap rock” formation above the formation being used as the zone of injection to prevent the migration of the injected material to the surface (see Figure 5-2). The CFI facility must also be accessible to MGM's drilling operations.

The Aput C-43 was selected for the site of the CFI facility as it meets all the above criteria.

9 Traditional and Other Land Use

9.1 Areas of Overlap

Activities associated with the proposed Project will be concentrated in the outer Mackenzie Delta on Ellice Island (Figure 4-1). A review of the Inuvialuit Community Conservation Plans (CCPs) for Tuktoyaktuk (TCCP 2000), Inuvik (ICCP 2000) and Aklavik (ACCP 2000) indicates that the Project areas overlap with six Inuvialuit Special Management Areas (Table 9-1). The CCPs include recommended land use practices for areas that are of particular significance and sensitivity during special times of the year (Category C), or throughout the year (Category D).

Ellice Island is located in a remote portion of the western Mackenzie Delta (Figure 4-1). During consultation with communities and the Hunter and Trapper Committees, no issues related to harvesting or other traditional land uses were identified.

A review of the Inuvialuit Harvest Study Atlas (Fabijan et al. 1993) shows that although there is minimal harvesting activity within the Project area, Ellice Island is mainly important for bird harvesting and fishing. Details are provided in the following sections.

Table 9-1 Inuvialuit Special Management Areas that have Spatial and Temporal Overlaps with the Project Footprint

Site Number	Site Name	Importance	Spatial Overlap	Temporal Overlap	CCP Noting Site as Important
304C	Spring Goose Harvesting	Key area for subsistence hunting in the spring.	Yes, limited	No	Tuktoyaktuk
312C	Fall Goose Harvesting Area	Key area for subsistence harvesting of geese during the fall	Yes, limited	No	Tuktoyaktuk
323C	Mainland Coastal Polar Bear Denning Areas	Important for polar bear denning (October – March)	Yes, limited	Yes	Tuktoyaktuk
715C	Mackenzie River Delta Key Migratory Bird Habitat	Important nesting and breeding habitat for birds (May to September); subsistence harvesting of beluga (June 15 to August 15) and waterfowl (June to September)	Yes	No	Tuktoyaktuk Aklavik Inuvik
718D	Central Mackenzie Estuary	Concentration area for beluga; transit area between Kugmallit Bay and Shallow Bay; fish feeding, nursery and overwintering area	Yes	Yes – fish overwintering	Tuktoyaktuk Aklavik Inuvik
719C	Inner Mackenzie Delta	Important habitat for fish, waterfowl, moose and furbearers.	Yes	Yes – fish overwintering	Tuktoyaktuk Aklavik Inuvik

9.2 Migratory Birds and Harvesting

The Project activities will have spatial overlap with a number of areas that provide important habitat for migratory birds (715C, 718D, 719C). The Project overlaps with sites that have been identified for harvesting of spring and fall geese (304C, 312C). Harvesting of waterfowl, such as white-fronted goose, Canada goose, and snow goose, may occur throughout Ellice Island; however, these activities typically occur along the outer western shore and opportunistically along channel travel routes. As Project activities are occurring in winter months, few, if any overlap with key life stages or harvest activities for migratory birds are expected.

9.3 Fish and Fishing

The Project is located within an area identified as important for overwintering, nursery and feeding areas for fish (718D and 719C). No fish harvesting areas were identified within CCPs for Inuvik, Aklavik or Tuktoyaktuk. Preferred fish harvesting areas are located to the east of the Project footprint. Project activities will not occur during the same time as fish harvesting, although channels that will be used for Project water withdrawals could include those that are important overwintering areas.

9.4 Polar Bear

The Project area overlaps important polar bear denning habitat used during winter months (323C). Past community consultation, a presentation by Environment Canada to the Joint Review Panel for the Mackenzie Gas Project and KAVIK-AXYS project experience indicate the possibility of polar bears in the Project area during winter (McCormick 2006, internet site; KAVIK-AXYS 2004a).

During consultation, communities recommended that: denning site information be obtained in advance from ENR, that wildlife monitors familiar with the area be employed and that scouting in advance of the work is completed to locate potential den sites for polar bears. A wildlife monitor will be employed during winter operations to advise on and help MGM effectively manage wildlife issues.

10 Community Consultation

10.1 Summary of Public Involvement

In addition to providing an update to the current MGM exploration programs, formal consultation occurred for the proposed:

- 2008-2011 Summer Field Assessment and Advance Barge Project
- 2008-2011 Drilling and Seismic Programs
 - Atik 3D seismic program
 - Inuvik North 2D seismic program
 - Ogruknang 2D seismic program (possible amendment)
 - West Langley seismic program
 - Umiak Seismic program
 - Inuvik Block Wells (2 well drilling program)
 - West Langley Well
 - Ogruknang Well (1 well drilling program)
 - Umiak Wells (3 well drilling program)
 - West Delta Wells (7 well drilling program)
 - Cuttings and Fluids Injection Facility

Consultations were conducted from February 12-18, 2008 in Tuktoyaktuk, Inuvik and Aklavik. In addition to these consultations, a further update to MGM operations including the proposed *Cuttings and Fluids Injection Facility* was conducted April 16-30, 2008. The purpose of the consultation meetings and the update meetings was to discuss Project plans, community concerns and proposed mitigations. Communities and local organizations were notified of the proposed Projects, schedules, and the technical details.

Community members and leaders were invited to participate in the evening information sharing and formal presentation session through advertisements posted on community bulletin boards. Emails and facsimiles were also sent to organized groups. The advertising was in place for one week prior to the consultation meetings. In addition, radio ads were transmitted locally prior to the meetings.

Separate meetings were held with the HTC's in each community, and a combined meeting was held in each community with community corporations, elders committees and the general public. Table 10-1 presents the meeting schedule and the number of attendees at each location.

For the meetings conducted in February, four MGM representatives attended the meetings with the HTC's and the community sessions. For the meetings conducted in April, there were two MGM representatives in attendance. The formal presentations consisted of a PowerPoint presentation with specific information on the proposed projects. Paper copies of the presentation were made available. The committees and community members asked questions during and after the presentation.

Table 10-1 Community Consultation Meeting Schedule

Date	Group	# Attendees	Location
12 Feb. 2008	Meeting with Inuvik Hunters and Trappers Committee	6 members	Hunters and Trappers Office, Inuvik
12 Feb. 2008	Joint Meeting with: Inuvik Community Corporation Inuvik Elders Committee Public	0 members 1 members 2 members	Ingamo Hall, Inuvik
13 Feb. 2008	Meeting with Aklavik Hunters and Trappers Committee	4 members	Hunters and Trappers Office, Aklavik
13 Feb. 2008	Joint meeting with: Aklavik Community Corporation Aklavik Elders Committee Public	3 members 1 members 3 members	Hamlet Office, Aklavik
18 Feb. 2008	Meeting with Tuktoyaktuk Hunters and Trappers Committee	3 members	Hunters and Trappers Board Room, Tuktoyaktuk
18 Feb. 2008	Joint meeting with: Tuktoyaktuk Community Corporation Tuktoyaktuk Elders Committee Public	0 members 0 members 0 members	Kitti Hall, Tuktoyaktuk
16 April 2008	Inuvik Hunters and Trappers Committee	2 members	Hunters and Trappers Office, Inuvik
17 April 2008	Inuvik Hunters and Trappers Committee	5 members	Hunters and Trappers Office, Inuvik
17 April 2008	Tuktoyaktuk Hunters and Trappers Committee	5 members	Hunters and Trappers Board Room, Tuktoyaktuk
17 April 2008	Joint meeting with: Tuktoyaktuk Community Corporation Tuktoyaktuk Elders Committee Public	 0 members 0 members 0 members	School Gym, Tuktoyaktuk
28 April 2008	Joint Meeting with: Inuvik Community Corporation Inuvik Elders Committee Public	 0 members 0 members 0 members	
29 April 2008	Joint meeting with: Aklavik Community Corporation Aklavik Elders Committee Public	 0 members 1 member 2 members	Hamlet Office, Aklavik
30 April 2008	Aklavik Hunters and Trappers Committee	5 members	

10.2 Summary of Issues and Concerns

The Project was discussed at each meeting. Table 10-2 presents a summary of the issues for all projects and those specific to the CFI facility that were raised in public consultation and the sections of this document where these concerns are addressed. A complete listing of feedback, questions and answers from each of these meetings is included in Appendix C.

Table 10-2 Summary of Public Consultation Issues and Responses

Concern	Response	Document Section
Concern about Cumulative Impacts on the Land		
Are all the programs shown planned for next year?	What we are showing are all the new proposed programs we may want to do over the next three seasons.	Figure 4-1 Section 5.1
Disturbance on the Land		
Are all the access routes shown on the map going to be used?	No- this map is showing all possible access routes. We may use the same or different access routes for our various programs over the three seasons.	Figure 4-1 Section 5.3.1
Are there any overland access routes?	We try to build access roads on river channels as much as possible, however sometimes overland routes are shorter and safer.	Figure 4-1 Section 5.3.1
You talk about an injection well. Any studies on if it works here? We are concerned about making our land a dumping site.	I don't know if injection has been used here. It is common practice around the world to use injection wells. The cuttings and mud are from wells on Inuvialuit land and will be injected back into wells on Inuvialuit land.	Section 7
We'd like to see the site before and after in person if possible and at least by photos.	We will have photos available of the site before and after. If safety and regulatory requirements are met and there is room in the transport equipment we'll take someone from the HTC out to the site as well.	Figure 11-1
Safety Concerns		
How deep is the permafrost?	We are not sure as it varies in depth. We drill through the permafrost and set casing at a proper depth as determined by engineering and regulatory requirements.	Section 11.3
General Program Questions/Comments		
What are the crosshatched areas on the map?	These are protected areas.	Figure 4-1
According to the Screening Committee, PD's are to be sent directly to the HTC offices. Please provide Tuktoyaktuk HTC with 7 copies.	Thanks for the information. Comment noted.	
Do you monitor and record the amount of cuttings and fluid that is pumped down an injection well?	Yes, the amount of cuttings and fluid injected will be recorded.	Section 5.3.4.3
How much mud and cuttings come out of a well?	Each well is different (depth, rock type, drill size, hardness of the rock, etc.) a rough number would be around 2000 cubic metres.	Section 5.3.4.3

Table 10-2 Summary of Public Consultation Issues and Responses (cont'd)

Concern	Response	Document Section
Can you just pump it (cuttings and mud) down the hole?	Yes, either back down the wellbore into a formation or down another wellbore into a formation. Again, this depends on the underground rock formation, equipment, geology, regulatory requirements, etc.	Section 5.3.4.3
Would you use an existing well or drill a new well for fluid and cuttings injection?	We would have to look at a lot of different factors such as proximity to our drilling program, access, well ownership, type of formations downhole, etc. Our preference would be to use an existing well.	Section 5.3.4.1
How much cuttings and mud (number of wells) can you put into an injection well?	Preliminary studies show it is possible to inject more than one well and potentially up to approx. 100 wells worth of cuttings and mud into a dedicated injection well.	Section 5.3.4.1
How much time does it take to get an injection well operational?	It depends on the regulatory approval process, availability of equipment, access to the site, etc. We are hopeful that we could have an injection well in place for this coming drilling season.	Section 6
What is the material that goes down the hole?	Cuttings and fluid from a drilling operation.	Section 5.3.4.3
Injection beats the heck out of sumps anyways.	Thank you for your comment.	
Concern about Waste Disposal		
Are you treating sewage? Often it doesn't pass specs.	We are treating our sewage. If it does not pass it is trucked to the Inuvik Lagoon. We do not spray to land if it does not pass specification.	Section 5.6.1.1
Comment on Employment		
Industry is good and bad up here. Jobs are good; MGM is responsive to needs and concerns of the community.	Thank you.	
Impacts on People Living on the Land		
Can you notify the HTC's prior to flying helicopters, scouting, etc. so we can answer questions from cabin owners, etc?	Yes. We have in the past season and it seems to work well.	5.3.5.4 5.3.4.4
You have drilled five wells and trucked the cuttings south from the last three. Aklavik HTC would like more information before injection would be okay with us. We would like to see more studies and clarification and more consultation on injection wells. Maybe you should have the NEB here with you. We probably won't be able to have another HTC meeting (quorum) until August as we lost one member and everyone is out traveling.	MGM will submit a Project Description for an injection well, and continue to work with the Aklavik HTC to further inform them on the injection process. MGM understands that it will be difficult for the Aklavik HTC to have a quorum at their meetings in the near future, so MGM will provide the Aklavik HTC with additional public information on the injection process including general cuttings and fluid data via your office for distribution to your committee members.	Section 7

Table 10-2 Summary of Public Consultation Issues and Responses (cont'd)

Concern	Response	Document Section
Affects on Fish and Wildlife		
Do you fly over the land looking for dens, plants, etc.?	Yes, there will be archaeological and biophysical studies done to identify rare plants, gravesites, etc. Marsha Branigan (GNWT) will identify any bear dens in the area.	Section 12.5.5
Concern about Spills & Leaks		
How fast do you use the fuel?	The amount of fuel staged at the start should be enough to complete the entire program and enough for the barges to travel back at the end of the program.	Section 5.4
Are you using biodegradable grease in the water pumping process?	We will find out and provide this information to the Aklavik HTC.	5.5
Will you use berms for storage of fuel on land?	We would likely use Envirotanks for fuel storage on land.	Section 5.3.2.2 Section 5.4
Can the drilling mud be dealt with in the Delta? Will it come to the surface such as a lake, far away from the well it is injected into?	The material would be injected into formations that are far below any lakes, etc. The formations selected will provide a permanent seal and keep the material trapped. There are strict regulations governing injecting drilling mud and cuttings down a hole.	Section 5.3.4.1 Figure 5-2 Section 8.1
Have you heard of any cuttings or fluids coming back up to the surface in other places?	Not to our knowledge. The formations (soft rocks) into which the cuttings and fluids are pumped are a long way below surface and the formations are selected based on their ability to accept and store cuttings and fluids. There are regulations that need to be followed in order to inject cuttings and fluids.	Section 5.3.4.1 Figure 5-2 Section 8.1

11 Environmental Overview

11.1 Introduction

The CFI facility is located on the south western portion of Ellice Island in the western portion of the outer Mackenzie Delta. This area is characterized by the numerous channels, lakes, ponds and islands which dominate the terrain. This area is the active portion of the Mackenzie Delta and is subject to frequent disturbance by inundation, sedimentation, sea ice scour and storm surges. The Project area is continually shaped by a range of geological and fluvial processes, including: isostatic rebound; marine effects from the Beaufort Sea; flooding from the Mackenzie River; and the influence of underlying permafrost. This section provides an overview of environmental components of importance in the Project area, including:

- air quality
- terrain, soils and permafrost
- hydrology and water quality
- aquatic resources
- vegetation
- wildlife
- cultural resources

All advance barging/staging locations and on-ice access roads have been previously assessed, screened and approved by the EISC as described in the *MGM Energy Corp. 2007, 2008 and 2009 Summer Field Assessment and Advance Barge Project, Summer Field Assessment, Advance Barge and Staging Project: 2008-2011, MGM Energy Corp. Ellice, Langley and Olivier Drilling, Completion and Testing Project Winters 2007-2008, 2008-2009 and 2009-2010 and MGM Energy Corp. West Delta Winter Drilling, Completions and Testing Project 2008-2009*. This section will assess the CFI facility and associated operations.

11.2 Air Quality

Site-specific information on background air quality conditions in the Mackenzie Delta -Beaufort area is limited; however, short-term monitoring results near Inuvik and Richards Island (Slaney 1973a, 1973b) indicate that ambient sulphur dioxide (SO₂) and nitrogen dioxide (NO₂) levels are below method detection limits.

In 2003, the Government of the NWT installed an air quality monitoring station in Inuvik. The results of the monitoring for that year indicate sulphur dioxide (SO₂) levels are more than ten times lower than NWT Standards (GNWT 2003). The station recorded NO₂ levels that were well below Canadian National Ambient Air Quality Objectives (GNWT 2003). There are no NWT standards for NO₂. It is expected that background levels for SO₂ and NO₂ for the Project area would be similarly low because of the lack of current development and industrial activity in the region. Table 11-3 identifies ambient air quality standards for the NWT.

Table 11-3 Northwest Territories Ambient Air Quality Standards

Parameter	Standard (in $\mu\text{g}/\text{m}^3$) ¹	Standard (in ppb _v) ²
Sulphur Dioxide (SO₂)		
1-hour average	450	172
24-hour average	150	57
Annual arithmetic mean	30	11
Ground Level Ozone		
8-hour running average	127	65
Total Suspended Particulate		
24-hour average	120	N/A
Annual geometric mean	60	N/A
Fine Particulate Matter (PM_{2.5})		
24-hour average	30	N/A
NOTES: ¹ Micrograms per cubic metre ² Parts per billion by volume		
SOURCE: GNWT (2003)		

11.3 Terrain, Soils and Permafrost

The terrain of Ellice Island is low-lying with elevations generally close to sea levels with few areas above 20 m in elevation. The area is generally flat to gently sloping, and is composed primarily of recent river sediments.

Soils in the outer delta vary in relation to permafrost depth, drainage and frequency of inundation. Where permafrost is deeper than 1 m and soils are not frequently flooded (i.e., less than annually), orthic regosol soils have developed (Heginbottom 2000). Where permafrost is found within 1 m of the surface, brunisolic, regosolic or glyesolic static cryosol soils have developed (Heginbottom 2000). Much of the Project footprint exhibits wetland characteristics, frequently showing organic cryosol soil development. Wetlands are typically composed of moderately decomposed fen peat, and polygonal peat bogs. Areas of recent deltaic deposition show little or no soil development, with deposits exhibiting sandy loam texture.

Permafrost in the outer delta is discontinuous. The presence, temperature and depth of permafrost vary regionally over the outer delta. Depending on the location, between 35 % and 65% of the land surface may be underlain by permafrost (Heginbottom 2000). Permafrost on outer delta tends to be thinner than the surrounding region, especially compared to areas further to the east. Permafrost depths for the outer delta range between 74 m and 90 m (Taylor et al. 1982). Permafrost is absent or lies very deep beneath larger, deeper lakes and channels that do not freeze to bed level in winter. In areas of continuous permafrost, features known as taliks are areas of unfrozen ground, often associated with waterbodies. The active layer that experiences seasonal thaw may extend to approximately 1 m below the ground surface, but may be much shallower.

11.4 Hydrology and Water Quality

The Project will be accessed from frozen channels, other suitable waterbodies, and/or overland routes in Mackenzie Delta. Spring flooding is the most important hydrologic process in the area (Bigras 1990). Peak water levels typically occur from late May to early June and are influenced by ice jams up-river in the main channels of the Delta (Bigras 1990; Marsh et al. 1999). After spring floods, water levels recede over the summer months, with the exception of the occasional rise in water levels because of rainstorms upstream of the Delta (Marsh et al. 1999). The Mackenzie River waters are characterized by high concentrations of fine sediments which diminish along with the river discharge values themselves, through the fall, winter and early spring periods (Carmack and Macdonald 2002).

The hydrology of lakes in the outer Delta is determined primarily by their elevation relative to water levels of the nearby Mackenzie River channels (Marsh et al. 1999). The hydrology of lakes is also influenced by snow melt and surface runoff from the surrounding area. Larger lakes may provide overwintering habitat for fish.

The Project area is underlain with permafrost. Permafrost prevents the downward movement of water. Water, from rain or snowmelt, flows horizontally through the ground above the permafrost which contributes to the hydrology of the numerous lakes across the landscape.

Small and shallow lakes, typically less than 10 hectares and not deeper than 4 m, are common on Ellice Island. During winter, lakes with water depths of 2 m or less typically freeze to the bottom. There are some larger lakes on Ellice Island that do not freeze to the bottom.

Across the Mackenzie Delta, evaporation is greater than summer precipitation and similar or greater than annual precipitation (Bigras 1990).

Storm surges from storm events on the Beaufort Sea can cause flow reversals in channels, which can extend tens of kilometres upstream, and can affect lake outlets on Ellice Island. These flow reversals replace warm fresh water in the affected channels with colder more saline water. Storm surges can also cause flooding of low-lying areas typical of the Project footprint, which can result in saline water on land and in lakes of affected areas for an indeterminate period.

Temperature, turbidity and the presence of metals result in fair to marginal water quality for potability and general human uses in the lower Mackenzie Delta (Health Canada 2004). Water quality is considered excellent to good under guidelines for protecting aquatic life (CCME 2003).

11.5 Aquatic Resources

The Mackenzie Delta and estuary support a diversity of marine, anadromous and freshwater fish species. They provides critical habitat for spawning, migration and overwintering for a variety of species (ACCP 2000; Sekerak et al. 1992). In many cases, overwintering habitat is a limiting factor for fish populations (Sekerak et al. 1992). The overwintering capability of aquatic habitats in the region is dependent on depth, temperature, salinity and dissolved oxygen. Of these, temperature and salinity are likely the most critical and limiting (Sekerak et al. 1992).

The greater Project area includes a variety of aquatic environments and fish habitat. It is probable that most species are resident in the region throughout the year, although they may move between habitats on a seasonal basis. In general, little scientific information on localized fish distributions and fish habitat of Reindeer Channel exists for the Project footprint. Limited information was provided by Slaney (1976), who noted that 27 species of fish were caught in 1972 and 1974 summer surveys conducted in eastern Mackenzie Bay, an area outside the Project footprint.

Ellice Island lies within the Central Mackenzie Estuary (Special Management Area 718D in the Aklavik, Inuvik and Tuktoyaktuk Community Conservation Plans (ACCP/ICCP/TCCP 2000)). Some of the more important species likely to be found in the Project footprint are the coregonids (inconnu, arctic cisco, least cisco, broad whitefish and lake whitefish), burbot and northern pike (Stewart et al. 1993, Crawford 1989). These are of concern because of their importance to the domestic fishery, which accounts for the majority of the harvesting in the Mackenzie Delta region (Crawford 1989). Lake trout may be found in deeper lakes in the area.

Some marine or estuarine fish species may be present in outer Mackenzie Delta channels, especially at the mouths of these channels or when wind pushes marine water up the channels. Species surrounding the outer extents of Ellice Island could include the saltwater fourhorn sculpin, rainbow smelt, and arctic and starry flounder.

Mackenzie River channels, such as Arvoknar and Reindeer, provide important migratory corridors for coregonids between coastal feeding areas and upstream spawning locations. During break-up, young-of-the-year coregonids are flushed into the outer delta and coast through these channels (Evans et. al 2002). In summer, adult spawners move up Middle and other channels to spawning areas further upstream (Evans et. al 2002). In late fall spent adults move back down into the outer delta area for overwintering (Evans et. al 2002).

Not all lakes, streams and delta channels provide year round habitat. Shallower lakes and small streams in proximity to the Project footprint may provide summer feeding or rearing habitat for freshwater fish, while lakes greater than 4 m depth (Slaney 1976) may provide overwintering habitat.

11.5.1 Species with Special Conservation Status

Table 11-1 provides information on the conservation status rankings for fish species in the Project area. The freshwater form of the fourhorn sculpin, *Myoxocephalus quadricornis*, is found as a landlocked relic in deep, cold lakes (COSEWIC 2003a). In the NWT they have only been found along Tuktoyaktuk Peninsula (COSEWIC 2003a) but may exist elsewhere. In Canada they have also been found in Nunavut and Newfoundland-Labrador. Globally populations of four horn sculpin have been recorded in the United States, Russia, Finland, Norway and Sweden. The freshwater form should not be confused with the saltwater form, which is known to be widely distributed in estuarine and coastal environments in the region. Saltwater fourhorn sculpin likely overwinters in bays in the Project area (Slaney 1976; Lawrence et al. 1984). The saltwater form is easily distinguished from the freshwater form by its larger size and the prominence of fourhorn-like structures on the top of its head. The freshwater form is small, and the fourhorn-like structures are either absent or poorly developed (COSEWIC 2003a).

Table 11-1 Fish Species with Special Conservation Status

Species	ENR ¹	COSEWIC ²	SARA ³
Fourhorn sculpin (freshwater)	Not listed	Data deficient (formerly Special Concern)	Not listed
Pighead prickleback	Not listed	Data deficient (formerly Special Concern)	Not listed
NOTES: ¹ Environment and Natural Resources, Government of Northwest Territories ² Committee on the Status of Endangered Wildlife in Canada (COSEWIC) ³ Species at Risk Act (SARA)			

In Canada, the pighead (formerly blackline) prickleback (*Acantholumpenus mackayi*) has only been found in the Western Arctic coastal waters. Pighead prickleback have been captured at Phillips Bay (Bond and Erickson 1989), Liverpool Bay (Bond and Erickson 1993), Tuktoyaktuk Harbour (Hopky and Ratynski 1983), and Kugmallit and Hutchinson Bays (COSEWIC 2003b). The number of individual populations of pighead prickleback and their abundance is unknown. Outside Canada, pighead prickleback have been captured in the Okhotsk Sea in Japan, and the Chukchi Sea, as well as Norton Sound and Bristol Bay, Alaska (COSEWIC 2003b).

11.6 Vegetation

The majority of Ellice Island is composed of flat, low-lying terrain at or near sea level. Vegetation communities colonizing recent delta deposits are dominated by wet sedge and cotton-grass species, commonly including water sedge (*Carex aquatilis*), narrow-leaved cotton-grass (*Eriophorum angustifolium*) and fisher dupontia (*Dupontia fisheri*). Slightly more stable areas of the active delta support more successional-developed vegetation communities characterized by short willows with a sedge understory. These communities typically colonize the slightly more raised habitats and channel levees (created by increased sedimentation of fine sand and silt) and intersperse the wet sedge community type. Characteristic species include felt-leaf willow (*Salix alaxensis*), Richardson's willow (*Salix richardsonii*), horsetail (*Equisetum* species) and narrow-leaved cotton-grass (*Eriophorum angustifolium*). Low centered polygons dominated by sedges, cotton-grasses and sphagnum mosses may also develop.

Survey work conducted in the summer of 2007 found that the Aput site is characterized by a complex of three distinct vegetation cover types that are locally common. The first and most dominant is a thick herbaceous cover of water sedge interspersed with forbs. In some locations the water sedge cover grades into short shrubs, mainly blue-green willow and Richardson willow, within the standing water zone. At this location much of the willow cover is dead. Local information indicates that this die-off occurred several years ago – possibly due to a storm surge, but this is unproven. The least dominant vegetation cover type is sedge and willow community containing patches of standing water. Some aquatic species occur in the standing water including northern bur reed (*Sparganium hyboreum*) and spiked water milfoil (*Myriophyllum sibiricum*). Overall the species diversity of plants is low (Figure 11-1). No rare plants or communities were found during the 2007 summer survey.



Figure 11-1 **Vegetation at the Aput C-43 Site**

11.7 Wildlife

Wildlife species which are anticipated to be present within the Project footprint provide an important subsistence harvest resource for communities, as identified in Section 9. The habitat types within the Project footprint support a number of wildlife species of special conservation status, both territorially and federally. These species are listed in Table 11-2.

11.7.1 Species of Conservation Concern

Species status rankings are prepared based on the best available scientific information. There is a legal requirement to prevent or mitigate effects on species listed under the *Species at Risk Act* (SARA). Several categories or schedules are listed in the Act. Schedule 1 species are classed as being at risk (extirpated, endangered, threatened) according to up-to-date COSEWIC assessments. These species and their residences are protected on Federal lands as of June 5, 2004. Schedule 2 species have a similar status ranking, but are due for reassessment. Once reassessed, species may be placed on Schedule 1 if they continue to be at risk. The status of Schedule 3 species will be reassessed by COSEWIC (no specific timeline) at the request of the minister responsible for such legislation.

The grizzly bear (northwest population) and short-eared owl are two species that are currently being reassessed, and which may be reassigned to Schedule 1 pending results of public consultation and final ministerial approval (SARA 2008, internet site). The polar bear (Southern Beaufort Sea population) completed a reassessment in 2008 and remains a species of Special Concern (COSEWIC 2008).

The Eskimo curlew, listed under Schedule 1 of the SARA, historically occurred in the Project area but may now be extinct. Other sensitive bird species will not be present during most of the Project activities. These species are listed in Table 11-4.

Table 11-2 Selected Wildlife Species with Special Conservation Status in or Adjacent to the Project Footprint

Species	NWT/ENR ¹	COSEWIC ²	SARA ³
Marine Mammals			
Polar bear	• Sensitive	• Special Concern	Not Listed
Terrestrial Mammals			
Grizzly bear	• Sensitive	• Special Concern	Not Listed ⁴
Wolverine	• Sensitive	• Special Concern	Not Listed ⁴
Migratory Birds			
Eskimo curlew	• At Risk	Endangered	Schedule 1
Peregrine falcon (<i>tundrius</i> subspecies)	May Be At Risk	Special Concern	Schedule 3
Rusty blackbird	May Be At Risk	Special Concern	Not Listed ⁴
Northern pintail	Sensitive	Not Listed	Not Listed
Lesser scaup	Sensitive	Not Listed	Not Listed
Common eider	Sensitive	Not Listed	Not Listed
King eider	Sensitive	Not Listed	Not Listed
Long-tailed duck	Sensitive	Not Listed	Not Listed
Harlequin duck	Sensitive	Not Listed	Not Listed

Table 11-2 Selected Wildlife Species with Special Conservation Status in or Adjacent to the Project Footprint (cont'd)

Species	NWT/ENR ¹	COSEWIC ²	SARA ³
Black scoter	Sensitive	Not Listed	Not Listed
Surf scoter	Sensitive	Not Listed	Not Listed
White-winged scoter	Sensitive	Not Listed	Not Listed
Arctic tern	Sensitive	Not Listed	Not Listed
Least sandpiper	Sensitive	Not Listed	Not Listed
Semi-palmated sandpiper	Sensitive	Not Listed	Not Listed
Hudsonian godwit	Sensitive	Not Listed	Not Listed
Red phalarope	Sensitive	Not Listed	Not Listed
Whimbrel	Sensitive	Not Listed	Not Listed
Common snipe	Sensitive	Not Listed	Not Listed
American golden plover	Sensitive	Not Listed	Not Listed
Short-eared owl	Sensitive	Special Concern	Schedule 3
<p>NOTES:</p> <p>¹ Environment and Natural Resources, Government of the Northwest Territories (ENR)</p> <p>² Committee on the Status of Endangered Wildlife in Canada</p> <p>³ <i>Species at Risk Act</i></p> <p>⁴ Species currently being evaluated for inclusion under SARA Schedule 1.</p>			

A wildlife habitat assessment of the Aput C-43 site conducted in summer 2007 revealed little habitat of value for grizzly bear, barren-ground caribou, or moose. Lowland sedge dominated habitat and patches of open water provide excellent breeding and foraging habitat for a variety of breeding waterbirds, including greater white-fronted geese, snow geese, tundra swans, and greater scaup. However, no wildlife or wildlife sign were observed at the Aput C-43 site.

11.7.2 Migratory Birds

The Mackenzie Delta provides key migratory bird habitat for a variety of shorebird and waterfowl species. The Project occurs in the Central Mackenzie Delta with the Kendall Island Bird Sanctuary in close proximity. These areas are of particular importance to migratory birds (Figure 4-1). Waterfowl (e.g., geese, ducks, swans) prefer habitat in marshy lowland areas with sedge, grass and horsetail vegetation. Shorebirds (e.g., sandpipers) congregate along areas with wet sedge, patterned ground and moist tundra in close proximity to water. Areas of higher elevation provide suitable habitat for species such as passerines, owls, raptors and grouse. Federally and territorially-listed bird species with potential to be found in the Project area are listed in Table 11-2.

Shorebirds, waterfowl and other migratory bird species are particularly sensitive to disturbances through the critical stages of nesting, brood-rearing, moulting and staging (Latour et al. 2006). Migratory birds arrive in the Mackenzie Delta starting in early May and return to southern over-wintering sites beginning in late August. The Project footprint contains both nesting and staging habitat for shorebirds and waterfowl. However, the timing of Project activities does not overlap with either of these life stages.

In general, the Project footprint supports little raptor habitat, although Project activities might overlap with the distributions of snowy owl, short-eared owl, peregrine falcon (tundrius subspecies), bald eagle, golden eagle, gyrfalcon, rough-legged hawk, northern harrier, sharp-shinned hawk, and merlin. However, most raptors generally nest in drier upland areas, in trees or on cliffs.

Willow ptarmigan and hoary redpolls are the only bird species known to over-winter in the Project area. These species are likely to be found on higher ground with shrub vegetation suitable for nesting and cover and therefore not in the immediate vicinity of the Project footprint.

11.7.3 Polar Bears

The Southern Beaufort Sea population of Polar bears occurs within the proposed Project area and has a population estimate of between 1500 bears (Schliebe et. al. 2006) and 1800 bears (Stirling and Taylor 1999), which is believed by local hunters to be increasing (Regehr et al. 2006).

Polar bear movements and habitat use are dictated mainly by the type and distribution of sea ice, and the density and distribution of seals, their primary food source (Stirling and Taylor 1999). Polar bear populations in the Beaufort Sea have a low reproductive rate because females become sexually mature at five years of age, and breed only every three or four years (Stirling and Taylor 1999, TCCP 2000); consequently, populations may be slow to recover in response to disturbance or disruption (Stirling 1990). Persistent pack ice in the Beaufort Sea means that polar bears are seldom found in the Mackenzie Delta during open water season (Martell et al. 1984). However they are known to maintain denning sites along the coastline from Kay Point to Kugmallit Bay (Special Management Area 323C Mainland Coastal Polar Bear Denning Areas, TCCP 2000), which overlap with the Project footprint.

Mating occurs in April and May, denning begins in early November, and young are born in December and January. Typical polar bear litters consist of one or two cubs. Most dens are established where relief structures promote the accumulation of snow such as large snow drifts on land, multiyear pack ice and rubble fields within landfast ice (Lentfer and Hensel 1980, Stirling and Taylor 1999). Maternity dens have been mapped along the outer Mackenzie Delta including sites in close proximity to northern Langley Island near the Project area (Stirling et al. 2005, internet site) and females bears show site fidelity to denning areas (Lentfer and Hensel 1980). The female and cubs leave the den in March or April (Stirling 1990).

Male bears may also den for short periods in the harshest part of winter. However, they are present for most of the winter outside of the Project area, feeding along the shear zone between pack ice and the leading edge of annual ice in the Beaufort Sea (COSEWIC 2002, internet site).

A portion of the Southern Beaufort Sea population of polar bears will over-summer in terrestrial dens located on the outermost extent of the Mackenzie Delta (Schliebe et. al. 2006) which may overlap with final site clean-up and reclamation activities.

The polar bear is considered sensitive in the NWT, and is listed as a species of Special Concern by COSEWIC (Table 11-4).

11.8 Cultural and Heritage Resources

11.8.1 Background

Portions of the Mackenzie Delta were available for occupation by approximately 9,000 B.C., after glacial ice had receded from the area. However, fluctuation of water and land levels during the Holocene, potentially affected human movement and accessibility of the landscape for human use. Remains of mammoth and large horned bison have been recovered from the Mackenzie Delta, confirming that at least part of the delta was suitable habitat for animal species that may have been hunted by early human occupants. Yukon wild ass and woolly mammoth remains have been recovered from the area of Tununuk Point. Although the presence of these faunal species suggests that the region was habitable for wildlife, the earliest evidence for human activity in the Mackenzie Delta dates to approximately 2,000 B.C.

11.8.2 Previous Archaeological Studies

There is little evidence of pre-contact period occupation of the proposed Project area. Although several archaeological studies have been undertaken in the Mackenzie Delta since the early 1970s, most of the research has focused on the eastern outer Delta and portions of Richards Island.

While there are no known archeological sites in close proximity to the CFI facility site, four known sites are located in the vicinity of the Project. NhTu 1 and HhTu 2 are indigenous historic sites consisting of a grave and ice cellar and a campsite. Site NhTux 1, located on Ellice Island, also contains a burial. One additional site, NiTw 3, consisting of the remains of a traditional campsite, is located on Gary Island.

Archaeological visibility or assessments in the region have resulted in a small database of known archaeological locations in the vicinity of the Project area, there are numerous examples of more modern Aboriginal use of the region. Gordon (1973) conducted a boat survey of *...where the Main Channel exits via Shallow Bay...* observed several trapping and fishing campsites belonging to the residents of Aklavik and Inuvik. Earlier than this, both Alexander Mackenzie and John Franklin explored the area, and provided evidence of its use.

11.8.3 Assessment of Archaeological Potential and Recommendations

The Aput location was investigated during the MGM Energy 2007 Summer Field Assessment Program. The Aput C-43 site was investigated for historical resources through pedestrian traverse, with visual surface examination. One shovel test was excavated in the area of the drill pad. It was found to contain water-saturated silty and heavy clays to depths of at least 30 centimetres below ground surface. No cultural materials were identified either in surface or subsurface contexts.

The presence of waterlogged deposits on an active alluvial floodplain indicates low archaeological potential. No archaeological, historic or traditional land use sites are in conflict with the Aput C-43 site. The Prince of Wales Northern Heritage Centre granted clearance to MGM Energy Corp. for the development of the Aput C-43 well location in 2007 under Northwest Territories Class 2 Permit #2007-013.

12 Proposed Mitigation and Anticipated Environmental Effects

12.1 Overview

This section describes the potential effects of Project activities on Valued Components (VCs), mitigation measures to reduce, control or eliminate these potential effects, and the implications of residual effects.

Potential environmental effects were identified through public consultation, review of the previous work conducted by MGM (including past field reconnaissance surveys conducted in proximity to the Project area; KAVIK-AXYS 2008), and review of existing scientific literature, maps, the Inuvialuit CCPs and the Inuvialuit Harvest Study (Joint Secretariat 2003).

The Project will be confined to the CFI facility site. Furthermore, all activities will be conducted during winter, avoiding key periods for wildlife and traditional harvesting activities. The Project is proposed in support of MGM drilling programs and activities will follow INAC's *Environmental Operating Guidelines: Hydrocarbon Wellsites in Northern Canada* (INAC 1986) and best management practices established by the drilling industry.

It is anticipated that these factors, along with the implementation of the proposed mitigation measures, will result in negligible residual effect on the VCs and that Project activities will not contribute measurably to cumulative effects in the area (Section 13).

12.2 Spatial and Temporal Scope

The spatial scope of the assessment included the Project footprint, consisting of the Aput C-43 site. Water withdrawal for ice pad development and for use in the slurry of drill cuttings will be taken from channels or other suitable waterbodies of the Mackenzie Delta. Where necessary, to assess the effects of the Project on wide-ranging environmental components (e.g., water and air quality, wildlife), a larger study area was used (Project area).

The temporal scope of the assessment mirrors the Project schedule (Section 6). Effects potentially lasting beyond the Project schedule were considered. However, since ground disturbance is not anticipated, the potential for long term effects are limited to the effects of accidents and malfunctions, or residual effects of sensory disturbance.

12.3 Valued Components

A VC is defined as an environmental, social, economic or cultural component that is considered important by the proponent, local communities, technical specialists and/or government. The assessment of Project effects on VCs provides an indication of Project effects on broader environmental and social conditions. Similarly, mitigation measures for Project effects on VCs provide protection for the broader environmental and social systems they represent.

Candidate VCs in the Project area were selected based on:

- sensitivity to Project effects
- importance to local communities and resource users
- territorial, national or international importance (including status under the SARA)
- value as an indicator of effects on related resources and broader systems

Candidate VCs were identified for the Project area based on the environmental overview and community consultation. Candidate VCs were screened to select final VCs based on their potential to be affected by Project activities. In this study, candidate VCs were excluded if they did not overlap temporally or spatially with the Project, or if there is no, or negligible, potential for the Project to affect them. Selected VCs and the rationale for selection are provided in Table 12-1. The selected VCs are the subject of further assessment and mitigation planning in Section 12.4.

Table 12-1 Candidate and Selected Valued Components in the Project Area and Rationale for Selection

Candidate VC	Selected VC	Selection Rationale
Air quality	No	<ul style="list-style-type: none"> Emissions will result from a number of continuous and intermittent sources such as the rig engine, CFI Facility, generators, vehicles. Most emission sources are diesel-powered engines. Emissions are temporary in nature will be rapidly dispersed, and are not expected to exceed NWT Air Quality Guidelines (Table 11-3).
Terrain, soil and permafrost	Yes	<ul style="list-style-type: none"> Activities on land may cause rutting, compression or surface disturbance. Spills may cause local effects to surface soil and permafrost.
Hydrology	No	<ul style="list-style-type: none"> Water supplies will be withdrawn from channels or other suitable waterbodies of the Mackenzie Delta. There will be no measurable effect on flows or water levels as a result of water withdrawal for the Project.
Water quality	Yes	<ul style="list-style-type: none"> Water quality may be affected by potential hydrocarbon and untreated wastewater spills or other accidental releases of deleterious substances.
Fish and fish habitat	Yes	<ul style="list-style-type: none"> Potential water quality effects from spills could affect fish and fish habitat.
Vegetation communities, including rare plants	Yes Vegetation Communities	<ul style="list-style-type: none"> Localized disturbance and loss of vegetation resulting from Project activities.
	No Rare Plants	<ul style="list-style-type: none"> No rare plants were found at the C-43 site during a summer field survey conducted in 2007.
Migratory birds and habitat	No	<ul style="list-style-type: none"> Proposed activities will take place during the winter when birds are not present Project activities will occur on the Aput C-43 site which was utilized in the winter of 2007-2008
Terrestrial mammals and habitat	No <ul style="list-style-type: none"> Barren ground caribou Moose Wolverine Grizzly Bear 	<ul style="list-style-type: none"> No suitable terrestrial mammal habitat was found at the C-43 site during a summer field survey conducted in 2007.
Marine mammals and habitat	Yes <ul style="list-style-type: none"> Polar bear 	<ul style="list-style-type: none"> Coastal polar bears may be denning or foraging in Project area.

Table 12-1 Candidate and Selected Valued Components in the Project Area and Rationale for Selection (cont'd)

Candidate VC	Selected VC	Selection Rationale
Traditional camp area	No	<ul style="list-style-type: none"> Archaeological surveys conducted in the summer of 2007 found no evidence of traditional camp areas at the Aput C-43 site
Beluga hunting	No	<ul style="list-style-type: none"> Project activities will occur outside of the Beluga Management Zone 1A.
Polar bear hunting	No	<ul style="list-style-type: none"> No polar bear hunting occurs in the Project area.
Fishing	No	<ul style="list-style-type: none"> Past community consultation indicated that the area is not used for winter fishing.
Bird hunting	No	<ul style="list-style-type: none"> Minimal temporal and spatial overlap of Project with spring goose hunting. No specific concerns raised during community consultation.
Archaeological sites	No	<ul style="list-style-type: none"> Archaeological surveys conducted in the summer of 2007 found no evidence of archaeological sites at the Aput C-43 site

12.4 Impact Assessment and Mitigation

The following mitigation measures will be implemented for the protection of the VCs selected in Table 12-1. There are two components for mitigation of effects:

- additional baseline data collection and site evaluations will be undertaken as part of the Summer Project field program prior to Project activities (Table 12-2). A field assessment for barge landing/staging sites and wellsites was submitted to the EISC in June 2007 and approved. Please see "MGM Energy Corp 2007, 2008 and 2009 Summer Field Assessment and Advance Barging Project" submitted under separate cover.
- mitigation measures for VCs implemented construction, operation and demobilization (Table 12-3). Appendix D contains a comprehensive list of environmental protection measures.

Table 12-2 Additional Data Collection and Site Evaluations

Potential Effects to Valued Component	Data Collection/Site Evaluation
Wildlife	
<ul style="list-style-type: none"> Potential disturbance to denning bears 	<ul style="list-style-type: none"> ENR to provide location of historic grizzly and polar bear den locations and/or conduct a survey prior to Project start-up

Table 12-3 Potential Effects and Mitigations for Valued Components

Potential Effects on Valued Components	Mitigation
Terrain, Soil and Permafrost	
Shoreline/lowland disturbance and erosion <ul style="list-style-type: none"> CFI facility has potential to disturb underlying soils through vehicle and equipment use. 	<ul style="list-style-type: none"> Ice pads will be constructed using low ground pressure vehicles. Only low ground pressure equipment will be used if there is less than 15 cm of snow. Other vehicles and equipment will only be used on constructed ice pads a minimum of 15 cm thick Rutting will be avoided. Vehicle movements will be suspended if rutting occurs. Mushroom shoes or boots will be used on bladed equipment.
Reduced permafrost integrity <ul style="list-style-type: none"> Spills. 	<ul style="list-style-type: none"> If ground disturbance is unavoidable (e.g., in the course of spill clean-up), the surface will be immediately reinsulated using uncontaminated cut vegetation and disturbed soil.
Water Quality	
Potential effects to surface water quality <ul style="list-style-type: none"> Surface disturbance and erosion Hydrocarbon spills 	<ul style="list-style-type: none"> All terrestrial Project activities (CFI facility) will take place on constructed ice pads which will facilitate thorough clean up of any accidental spills and protect soils from erosion and contamination, which could subsequently affect surface water quality. Fuel containment and handling procedures (Section 5.3.2.2, 5.4) will minimize the risk of fuel spills. Ice pads at the CFI facility will facilitate containment and effective clean-up of any accidental spills of deleterious materials. In the event of accidental spills, MGM's Emergency Response and Spill Contingency Plan (Section 14 and Appendix E) will ensure containment, thorough clean-up and proper disposal of absorbent materials and contaminated snow and ice. Prior to site abandonment, all working areas will be inspected for contaminant residues and cleaned up as required.
<ul style="list-style-type: none"> Drill cuttings and fluid spills 	<ul style="list-style-type: none"> Drill cuttings and fluids will be trucked to the CFI facility. A bermed storage ice pad will be developed at the CFI facility for material storage prior to injection. The site will be capable of holding 110% of the largest volume of liquid material stored.
<ul style="list-style-type: none"> Untreated wastewater releases 	<ul style="list-style-type: none"> All wastewater will be treated in approved facilities designed for proper containment and treatment. Treated wastewater will be disposed of in accordance with permit requirements. Ice pad at the CFI facility will facilitate containment and effective clean-up of any accidental spills of untreated wastewater.

Table 12-3 Potential Effects and Mitigations for Valued Components (cont'd)

Potential Effects on Valued Components	Mitigation
Fish and Fish Habitat	
Potential fish entrainment and mortality <ul style="list-style-type: none"> Water withdrawal using pumps and hoses (necessary to make ice pads) may result in fish kills 	<ul style="list-style-type: none"> Suction hoses and screens used for water withdrawal will be designed and operated in accordance with DFO <i>Freshwater Intake End-of-pipe Fish Screen Guidelines</i> (DFO 1995). Regular inspection of water trucks to ensure compliance. Mitigation for water quality listed above will protect fish and fish habitat.
Vegetation Communities (Including Rare Plants)	
Localized loss or damage of vegetation <ul style="list-style-type: none"> Damage to vegetation from ground disturbance Damage to vegetation from accidental spills Compaction and effects of delayed melting associated with ice pad 	<ul style="list-style-type: none"> Operations on land will be confined to winter (frozen ground) conditions. No rare plants or communities were identified at the site. Where vegetation removal or damage is necessary, e.g., in the case of spill clean-up, the area will be reinsulated with cut organic matter to prevent possible melting of permafrost and facilitate re-vegetation during final site clean-up and reclamation. The areal extent of on-land ice pad footprints will be minimized.
Polar Bears	
Disturbance of denning bears <ul style="list-style-type: none"> Direct disturbance during construction and operations Sensory disturbance during construction and operations 	<ul style="list-style-type: none"> MGM will incorporate the results of ENR identified den location information into the Project. IGC and CWS air traffic guidelines will be followed, where possible. Wildlife monitors will be present and consulted during activities.
Disturbance of foraging bears <ul style="list-style-type: none"> Sensory disturbance during construction and operations Sensory disturbance from reconnaissance flights 	<ul style="list-style-type: none"> Bear overflight guidelines will be determined through consultation with ENR. Wildlife monitors will be employed and consulted during activities.
Bear-human interactions <ul style="list-style-type: none"> Attractants from camps and worksites Safety 	<ul style="list-style-type: none"> ENR <i>Bear Encounter Response Guidelines for Oil and Gas Programs</i> will be followed (ENR 2005; Appendix F). MGM has also developed a Bear Protocol to mitigate bear-human interactions, including training, garbage management and monitoring. Wildlife monitors will be used to monitor bear activity, and to manage bear encounters. Bears will not be harassed.

12.5 Residual Effects of the Project on the Environment

Assessments of potential residual environmental effects of the Project after mitigation (Table 12-3) were based on the criteria presented in Table 12-4.

Table 12-4 Assessment Criteria for Potential Residual Environmental Effects

Criteria	Potential Outcomes			
Duration	Short-Term: Effect lasts for duration of Project	Medium-Term: Effect lasts for up to 5 years after activity ceases	Long-Term: Effect lasts greater than 5 years after activity ceases	
Frequency	Once: Effect occurs once	Intermittent: Effect occurs intermittently	Continuous: Effect occurs continuously	
Seasonal Timing	Season-Specific Effect is restricted to a particular season or season(s)		Non Season-Specific Effect could occur year round	
Geographic Extent	Project Footprint, Project Area or Regional			
Reversibility	Reversible or Irreversible			
Magnitude of effect change relative to VC benchmark (KAVIK-AXYS 2002)	None/negligible	Low (< 1%) – Class 3 Effect ¹	Moderate (1-10% of VC) – Class 2 Effect ²	High (>10%) – Class 1 Effect ³
NOTES: ¹ Class 3 Effect: The predicted trend in the measurable parameter under projected levels of development may result in a decline in the VC in the study area during the life of the project, but VC levels should recover to baseline after project closure. ² Class 2 Effect: The predicted trend in the measurable parameter under projected levels of development will likely result in a decline in the VC to lower than baseline, but stable levels in the study area after project closure and into the foreseeable future. ³ Class 1 Effect: The predicted trend in the measurable parameter under projected levels of development could threaten the sustainability of the VC in the study area, and should be considered of management concern.				

Existing technical information (including information presented in Section 12 and technical appendices), Traditional Knowledge, professional judgment and knowledge of the Project area were used to assess residual environmental effects and their significance. Wherever possible, thresholds and guidelines (e.g., water quality management objectives) were referenced when determining significance.

Potential residual effects of the Project after implementation of mitigation are discussed in Sections 12.5.1-12.5.5 and summarized in Table 12-5.

Table 12-5 Summary of Residual Project Effects

Valued Component	Potential Residual Effects	Significance
Terrain, Soil and Permafrost	Medium to long term, confined to footprint, reversible and negligible in magnitude	Not Significant
Vegetation Communities	Medium to long term, confined to footprint, reversible and negligible in magnitude	Not Significant
Water Quality	Short term, localized, reversible and negligible in magnitude	Not Significant
Fish and Fish Habitat	Short term, localized, reversible and negligible in magnitude	Not Significant
Polar Bear	Short term, localized, reversible and negligible in magnitude	Not Significant

12.5.1 Terrain, Soil and Permafrost

Ground disturbance will be mitigated by measures to be implemented during the Project. Residual effects on terrain, soil and permafrost were rated as medium to long term, confined to footprint, reversible and negligible in magnitude.

12.5.2 Water Quality

Potential effects on water quality relate mainly to fuel leaks and spills, and uncontrolled accidental wastewater releases. Measures to avoid, contain and remediate leaks, spills and other accidental releases to waterbodies are described in Table 12.3.

Water withdrawals for Project use will occur from channels or other suitable waterbodies of the Mackenzie River in proximity to the Project footprint. Potential effects to water quality will be negligible where sufficient depth and flow is present to ensure sufficient flow is maintained during water withdrawals.

The potential effects of the Project on water quality were rated as short term, localized, reversible and negligible in magnitude.

12.5.3 Fish and Fish Habitat

Mitigation to address terrain, soil and water quality concerns also provides protection for fish and fish habitat. Suction hoses and screens used for water withdrawal will be designed and operated in accordance with DFO Freshwater Intake End-of-pipe Fish Screen Guidelines (DFO 1995).

The potential effects of the Project on fish and fish habitat were rated as short term, localized, reversible and negligible in magnitude.

12.5.4 Vegetation

Vegetation may potentially be affected by vehicles, ice pad development and spills. Effects of ice pads on wet tundra typical of the Project area, based on observational studies, are virtually undetectable, even during the first growing season (McKendrick 2000). During the 2007 summer field survey, no rare plants or communities were found at the Aput C-43 site and concerns for vegetation were raised for the site. Effects on vegetation by low ground pressure vehicles used to build the ice pad should be minimal provided adequate snow and ice cover is maintained. Taller shrubs will be walked down or trimmed, depending on which results in the least disturbance. Residual effects on vegetation were rated as medium term to long term, confined to footprint, reversible and negligible in magnitude.

12.5.5 Polar Bears

Polar bears are wide-ranging species that may be present in the Project area during winter operations. The Project covers the coastline along the western edge of Ellice and has potential to cause disturbance to the species.

Although the Project is proposed at the southern extent of the Southern Beaufort Sea population, polar bears may be denning in coastal snow banks in the Project area. Denning bears (particularly pregnant females and young of the year) are vulnerable if they abandon a den in mid-winter. Once disturbed, denning bears are unlikely to return to the den, and may abandon cubs, or may begin traveling with cubs before they are mature enough to leave the den.

Active bears may stray into the Project area, possibly as a result of attractants at camps and other facilities.

Given the mitigation measures outlined in Table 12-3, such as consultation with ENR, management of attractants and use of Wildlife Monitors, potential effects of the Project on polar bears are rated as short term, localized, reversible and negligible in magnitude.

12.6 Effects of the Environment on the Project

Potential effects of the environment on the Project include severe weather and late ice formation or early break-up. In the event that environmental effects of the Project result in emergency conditions, MGM will implement emergency response measures as detailed in their ERP.

12.6.1 Severe Weather

Storm events may potentially affect winter travel (aircraft and ice roads) with consequential effects on safety and provision of supplies. MGM will rely on consultants and contractors with experience conducting Projects in the Arctic during all seasons, and will employ journey management protocols to ensure safe travel during Project activities. Winter storms could delay aircraft and ice road travel for up to several days. Any delays in provision of supplies due to storms, which are typically of limited duration, can be readily accommodated within the overall Project schedule and storage capacity onsite. No significant effects of weather on the Project are anticipated.

12.6.2 Late Ice Formation/Early Break-up

The timing of the formation or break-up of ice cover on the Mackenzie River could affect the construction and demobilization schedule. Frozen conditions are necessary for construction and operation of ice roads and ice pads. MGM can adapt the Project to suit conditions.

12.7 Effects of Accidents and Malfunctions

Accidents and malfunctions may affect safety and productivity on the Project, and may also negatively affect the environment. Strict adherence to environmental, health and safety policies and procedures will be enforced to reduce the likelihood of an incident. Should an incident occur, guidelines in the MGM Emergency Response and Spill Contingency Plan will be followed.

All incidents will be reported and each incident report will be reviewed to identify measures to avoid future similar incidents. Significant incidents and near-misses will be formally investigated by a trained investigation team.

Based on past performance of other programs in the region, incidents and malfunctions that may occur during the Project include hydraulic oil leaks and fuel/fluid leaks or spills. These potential issues are

described below, along with an indication of the likelihood of occurrence and the techniques used to minimize the effects of an accident.

12.7.1 Hydraulic Oil Leak

Hydraulic systems are widely used on mobile equipment and at the CFI facility. On occasion a hose or fitting may crack or leak, and fluid could spill onto the ice pad. Monitoring equipment and associated hoses, fittings and packing will verify the equipment's integrity and identify components with potential to leak. Preventative maintenance and regular equipment inspections will be conducted routinely during this type of operation to minimize the occurrence of these incidents.

In the event that a spill or leak does occur, MGM will implement their spill clean-up procedures. Any spilled material will be contained with absorbent materials from the Spill Kit and placed in a plastic lined bin, along with any contaminated snow or ice that is removed for disposal. The spill will be reported as required by regulatory guidelines to the NWT 24-Hour Spill Report Line (867 920 8130).

12.7.2 Fuel/Fluid Leaks or Spills

There are potential sources of leaks and spills associated with the CFI facility project. Hydraulic systems, vehicles, and fuel and waste storage containers are some of the potential sources. Incidents ranging from cracking of a hose or fitting can lead to fuel or fluid leaks or spills. Prevention, monitoring, inspection and maintenance measures will be employed to reduce the risk of spills or leaks. It is anticipated that by following these procedures, no detrimental effects on the environment will result.

Fuel tanks will either be double walled or have bermed secondary containment with 110% of the capacity of the largest tank. All vehicles will have drip pans placed underneath when stationary for more than 2 hours (Section 5.3.3.2, 5.4). The likelihood of any spill exceeding the capacity of the secondary containment structure is unlikely. The Mackenzie Delta Spill Response Corporation spill containment equipment containers will be used in support of the Project such that all equipment will be easily accessible in the event of a spill. The Mackenzie Delta Spill Response Corporation has additional spill equipment and trained personnel locally available if required.

13 Cumulative Effects

13.1 Assessment Approach

The assessment of potential cumulative effects is based on the following four steps (adapted from KAVIK-AXYS 2002):

1. Is the Project likely to have negative residual effects on VCs?
2. If so, are the residual Project effects (i.e., effects that remain after mitigation) considered low, moderate or high and will they act in a cumulative fashion with the effects of other projects, past, present, or future?
3. What is the significance of cumulative effects on the VC and what is the proportional contribution of the Project to these effects?
4. If the Project, in combination with other projects in the area, is likely to create a "significant negative cumulative effect," are there further mitigation measures that could reduce or eliminate the Project's contribution to these effects so that the cumulative effect is not significant?

13.2 Scope of Cumulative Effects Assessment

The spatial boundary for the cumulative effects assessment is defined approximately as the outer delta, extending from the Reindeer Channel at the west extent, to the East Channel of the Mackenzie River in the east (Figure 13-1). Justification for this spatial boundary is based on the need to include the following:

- the Project area including winter access roads and barge routes
- the distribution of recent, present and planned industrial projects in the western outer delta
- habitat similar to that found within the Project area, including low-lying habitat typical of the western outer delta

The temporal boundary of the cumulative effects assessment was based upon the likelihood of effects from past, other current projects and reasonably foreseeable projects to combine with similar effects from the proposed Project on environmental resources or resource harvesting. Projects included within the temporal scope of the cumulative effects assessment include:

- projects that have occurred one year prior to the proposed Project (fall 2007 to summer 2008) within the spatial boundaries defined above
- projects occurring at the same time as the proposed Project (fall/winter 2008-2009 through to fall/winter of 2010/2011) within the spatial boundaries defined above
- projects that are known of and have a reasonably foreseeable chance of occurring in the year following the Project (2009-2012) within the spatial boundaries defined above

The project inclusion list is outlined in Table 13-1. This table lists only those projects within the defined cumulative effects assessment study area that could have the potential to interact with any residual project effects of the Project. There may be a number of other projects planned but not disclosed at the time of writing.

Table 13-1 Cumulative Effects Assessment Project Inclusion List

Project Status	Proponent	Location	Type of Activity	Overlap
Past				
Summers and Fall 2007, 2008, 2009	MGM Energy Corp.	Langley, Ellice and Richards Island	2007, 2008 & 2009 Summer Field Assessment and Advance Barging Project. Sump monitoring (three sumps on Richards Island) and re-vegetation investigation (including agreements with Chevron and EnCana).	Temporal and spatial overlap; may use same access routes
Summer (ongoing)	Aurora Research Institute	Richards Island	Mallik long-term sump monitoring. Sump integrity and revegetation monitoring	Spatial and temporal overlap
Winter 2007-2008	Aurora Research Institute	Richards Island	Mallik Gas Hydrate Drilling Program (2006 – 2008) Testing of 1 well	No temporal or spatial overlap
Summer 2008 - 2010	Chevron	Langley and Olivier Islands	Long term sump monitoring (Langley I-48, Olivier H-01 and North Langley K-30)	No temporal or spatial overlap
Present/Approved (at same time as Project under review)				
Spring 2007 – 2009	Canadian Hydraulics Centre	Beaufort Sea	Ice rubble investigation surrounding abandoned drill platforms in the Beaufort Sea	Temporal and spatial overlap of helicopter flights over the Mackenzie Delta
Winter 2007-2008, or 2008-2009, or 2009-2010	MGM Energy Corp.	Ellice, Langley and Olivier Islands	Ellice and Olivier 3D Seismic Projects	Temporal and spatial overlap; may use same access routes and barge landing sites
Winter 2007 - 2008, or 2008-2009, or 2009-2010	MGM Energy Corp.	Ellice, Langley and Olivier Islands	Ellice, Langley and Olivier Drilling, Testing and Completion Project.	Temporal and spatial overlap; may use same access routes and barge landing sites
Summer 2008 -2009, or 2009-2010, or 2010-2011	MGM Energy Corp.	Ellice, Langley and Olivier Islands	Summer Field Assessment and Advance Barge Project	Spatial overlap; may use same access routes and barge landing sites
Winter 2008 - 2009, or 2009-2010, or 2010-2011	MGM Energy Corp	Ellice, Langley and Olivier Islands	West Delta Drilling, Testing and Completion Project.	Temporal and spatial overlap; may use same access routes and barge landing sites

Table 13-1 Cumulative Effects Assessment Project Inclusion List (cont'd)

Project Status	Proponent	Location	Type of Activity	Overlap
Winter 2008-2009; or 2009-2010; or 2010-2011	MGM Energy Corp.	Richards Island	Umiak Seismic Project	Temporal and spatial overlap; may use same access routes and barge landing sites
Winter 2008 - 2009, or 2009-2010, or 2010-2011	MGM Energy Corp	Richards Island	Umiak Drilling, Testing and Completion Project.	Temporal and spatial overlap; may use same access routes and barge landing sites
Reasonably Foreseeable				
Winter 2008-2009	MGM Energy Corp.	Beaufort Sea; North of Langley Island	West Langley drilling program. Single winter drilling program	Temporal and spatial overlap, may use same access routes and barge landing sites
Winter 2009-2010, or 2010-2011	MGM Energy Corp.	Inuvik Blocks	Ogruknang drilling, testing and completion project.	Temporal and spatial overlap; may use same access routes and barge landing sites
Winter 2009-2010, or 2010-2011	MGM Energy Corp.	Atik	3D Seismic Program	Temporal and spatial overlap, may use same access routes and barge landing sites
Winter 2009-2010, or 2010-2011	MGM Energy Corp.	Inuvik Block	2D Seismic Program	Temporal and spatial overlap, may use same access routes and barge landing sites
Summer 2008 onwards	MGP Environmental Field Studies	Niglintgak and Taglu.	Reconnaissance biophysical and historical resource surveys for siting of drilling, barge landings and access road	Potential spatial and temporal overlap.
Winter 2008-2011	MGM Energy Corp.	Mackenzie Delta	Cuttings and fluid injection facility	Temporal and spatial overlap, may use same access routes and barge landing sites

13.3 Screening of Residual Project Effects

Residual Project-specific effects were found to be negligible, once mitigation measures were considered, for all VC's for this VC, Project-specific effects were predicted to be **negligible** (Section 12.5).

13.4 Significance of Cumulative Effects

The potential cumulative effects of the projects identified in Table 13-1 must be considered in the context of both their spatial and temporal overlap with the proposed Project. For many VCs, measurable effects of each project will be local and temporary, lasting only for the duration of the Project and occurring close to or within the Project area.

The projects listed in Table 13-1 and the Project are not likely to act cumulatively on most VCs. Past projects are not considered as they lack both temporal overlap and proximity with the Project. A minimum of one drilling program and possibly a number of additional programs may take place on land in winter at the same time as the Project between 2008 and 2011:

- MGM – Ellice and Olivier 3D Seismic Project
- MGM – Ellice, Langley and Olivier Drilling Testing and Completion Project
- MGM – Umiak Drilling, Testing and Completion Project
- MGM – Umiak Seismic Project
- MGM – West Wells Drilling Project

Common components of these projects include; access routes; barge routes; and helicopter and aircraft routes.

All remaining onshore projects listed in Table 13-1 are summer data gathering projects, with limited potential to affect most environmental components or Inuvialuit harvesting. The two offshore projects, the Canadian Hydraulics Centre program and Imperial marine seismic program are not expected to contribute to cumulative effects with the proposed activities.

Multiple projects on the outer delta in winter have the potential to act cumulatively to affect polar bears. Although, not expected to all occur in over the same season, the potential, MGM – Ellice and Olivier 3D Seismic, MGM – Ellice, Langley and Olivier Drilling Testing and Completion, MGM – Umiak Drilling, Testing and Completion, MGM – Umiak Seismic, MGM – West Wells Drilling, MGM – West Langley Drilling Projects occur within known polar bear denning habitat. High industrial activity levels over a large area could result in displacement and sensory disturbance to polar bears. This increased disturbance could result in bears abandoning dens or moving to areas of less suitable habitat. Conversely, the presence of multiple seismic, drilling and testing camps throughout the outer delta could act as attractants for bears if not effectively managed. MGM will work with ENR to determine locations of active dens and subsequently to minimize disturbances in close vicinity of the roads, CFI facility and camp site during the winter injection period.

13.5 Mitigation of Cumulative Effects on Polar Bear

Though not considered to be a residual Project-specific effect after mitigation is implemented, it is important to recognise that the Project has potential to affect polar bears, and that multiple projects may occur in the same season within polar bear denning habitat. Collaborative mitigation efforts will be required between MGM's drilling and seismic projects, and with other industrial operators. The mitigation measures described below are intended to minimize the effect of multiple proposed developments on polar bears:

- work with ENR to identify existing known denning areas/sites that may be located within the Project area.
- MGM will employ wildlife monitors during winter operations to advise on wildlife issues or concerns where required, and to manage polar bear encounters
- MGM will adhere to ENR's Bear Encounter Response Guidelines for Oil and Gas Programs (ENR 2005; Appendix F)
- MGM will ensure ENR and other industrial operators are informed of any bear-human interactions to ensure these issues are monitored in a regional context

14 Emergency Response Plans

MGM has developed an ERP to be used for winter activities. A copy of the ERP is provided in Appendix E.

15 Cleanup, Reclamation, Disposal and/or Decommissioning Plan

Details of final decommissioning and waste clean-up and disposal at the Project site are provided in Section 5, Development Summary.

16 Other Environmental Assessments

Related PDs have been successfully screened by the EISC, entitled:

- Archaeological Investigations Chevron Canada Resources Archaeological Impact Assessment: 2004-2006 Ellice/Taktuk Drilling Program (Unfreed 2004)
- Project Description of the Proposed North Ellice and Olivier 3D Seismic Programs (IMG-Golder 2005)
- Chevron Canada Limited Proposed Garry/Langley Geotechnical Program. (KAVIK-AXYS 2005a)
- Chevron Canada Limited Proposed 2005 Summer Field Assessment Program. (KAVIK-AXYS 2005b)
- Chevron Canada Limited Proposed 2006/2007 Summer Field Assessment Program (KAVIK-AXYS 2006a)
- Chevron Canada Limited Taktuk, Langley and Farewell Drilling Program: Winter 2006-2008 (KAVIK-AXYS 2006c).
- MGM Energy Corp. 2007, 2008 and 2009 Summer Field Assessment and Advance Barge Project (KAVIK-AXYS, 2007)
- MGM Energy Corp. Ellice, Langley and Olivier Drilling, Completion and Testing Project Winters 2007-2008, 2008-2009 and 2009-2010 (KAVIK-AXYS, 2007)
- MGM Energy Corp. North Ellice and Olivier 3D Seismic Project Winter 2007-2008, 2008-2009 or 2009-2010 (IMG-Golder, 2007)
- MGM Energy Corp. Ogruknang 2D Seismic Program 2007-2008, 2008-2009 or 2009-2010 (IMG-Golder, 2007)
- MGM Energy Corp. Summer Field Assessment and Advance Barging and Staging Project 2008-2011 (KAVIK-AXYS, 2008)
- MGM Energy Corp. West Delta Winter Drilling, Completions and Testing Project 2008-2011 (KAVIK-AXYS, 2008)

Related PDs currently under review by the EISC submitted under separate cover and include:

- MGM Energy Corp. Umiak Winter Drilling, Completions and Testing Project 2008-2011 (KAVIK-AXYS, 2008)
- MGM Energy Corp. Umiak Seismic Program 2008-2011 (IMG-Golder, 2008)

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Appendix A Summary of IGC 2002 Overflight Guidelines

Table A-1 Summary of Advice Received by EISC from the Co-Management Groups for Recommended Environmentally Acceptable Minimum Flight Altitudes

Aircraft Type	Species/Situation	Recommended Altitude	Source
Not specified	Over areas likely to have birds	>650 m (2100 ft)	CWS [Wildlife Management Advisory Council (NWT)]
Not specified	Over areas where birds are known to concentrate (sanctuaries, colonies, moulting areas)	>1100 m (3500 ft)	CWS [Wildlife Management Advisory Council (NWT)]
Subsonic Aircraft	Over large mammals during ferry flights	>300 m (975 ft)	Department of Resources, Wildlife and Economic Development [Wildlife Management Advisory Council (NWT)]
Subsonic Aircraft	During wildlife surveys	>100 m (325 ft)	Department of Resources, Wildlife and Economic Development [Wildlife Management Advisory Council (NWT)]
Subsonic Aircraft	Aeromagnetic surveys in areas with large mammals	Timing should be restricted rather than altitude	Department of Resources, Wildlife and Economic Development [Wildlife Management Advisory Council (NWT)]
Not specified	When flying point to point in vicinity of caribou and other wildlife species	>610 m (2000 ft)	Transport Canada [Wildlife Management Advisory Council (NS)]
Not specified	Over parks, reserves, and refuges	>610 m (2000 ft)	Transport Canada

A.1 General Advice

- Minimise the number of flights whenever possible
- Fly at times when few birds are present (e.g., early spring, late fall, winter)
- Avoid large concentrations of birds (e.g., migratory bird sanctuary, breeding colonies, moulting areas)
- Avoid especially sensitive areas such as seabird colonies and raptor nesting sites
- Plan routes that minimise flights over habitats likely to have birds
- Use small aircraft rather than large aircraft whenever possible
- Use fixed wing aircraft rather than helicopters whenever possible
- Inform pilots of these recommendations in areas known to have birds
- Avoid hovering or circling because these activities may greatly increase disturbance
- Avoid caribou calving grounds whenever possible
- Aeromagnetic surveys should be controlled to prevent disturbance to large mammals by restricting the timing of the surveys rather than the elevation. These surveys should not take place near or on calving and post-calving areas during the period of May 25 to July 15. After July 15 they should avoid any areas known to have large aggregations of caribou
- Animals reactions will depend on a variety of situations including aircraft type, noise levels, speed of travel, overflight frequency, and animal activity (e.g., loafing, feeding, traveling) and its surroundings (water depth and clarity, substrate). The EISC may have to consider the circumstances of the activity on a case by case basis.
- DFO often recommends a minimum altitude of 400 m (1200 ft) for flights over marine mammal habitat in this region. Recommended or required minimum altitudes may be higher in areas of particularly intense aircraft activity, and in cases where flights are over marine mammal concentration areas, or at particularly sensitive times of their life cycle.

Exceptions to these recommendations may be warranted for scientific studies (e.g., wildlife surveys) in which the benefits for conservation clearly outweigh the risks and should be evaluated on a case by case basis.

Appendix B Waste Water Treatment Specifications



Edson, Alberta
 Grande Prairie, Ab.
 Fort St. John, BC.
 Fort Nelson, BC.
 TOLL FREE

780-712-8500
 780-933-8500
 250-785-8500
 250-774-8500
 866-785-8500

Wellco Energy Services wishes to take a moment to introduce you to the most advanced technology available in a package Waste Water Treatment System in Canada today.

PERMITTING

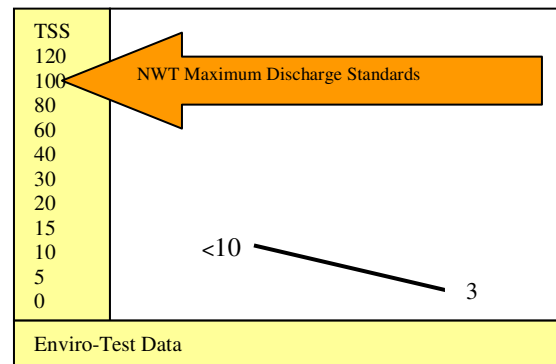
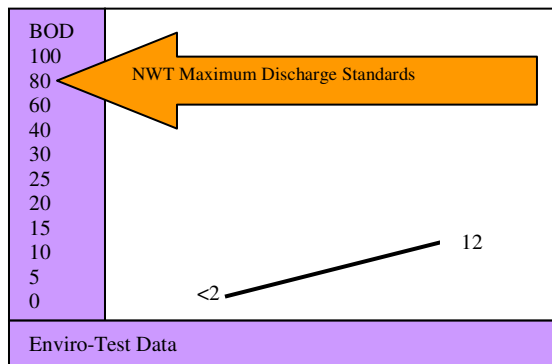
The permitting for a Waste Water Treatment System is very easy for our offices. The process requires we apply for a permit to construct a sewage disposal system with the local Health Authority office. In most cases the application is approved within a few days. In some extreme cases it has taken several weeks.



While area dependant, Wellco has received authority to reuse the discharged water for drilling fluids down hole. This has been approved on a per site basis only, but holds exciting potential for our industry as water supplies continue to diminish in many areas.

TESTING

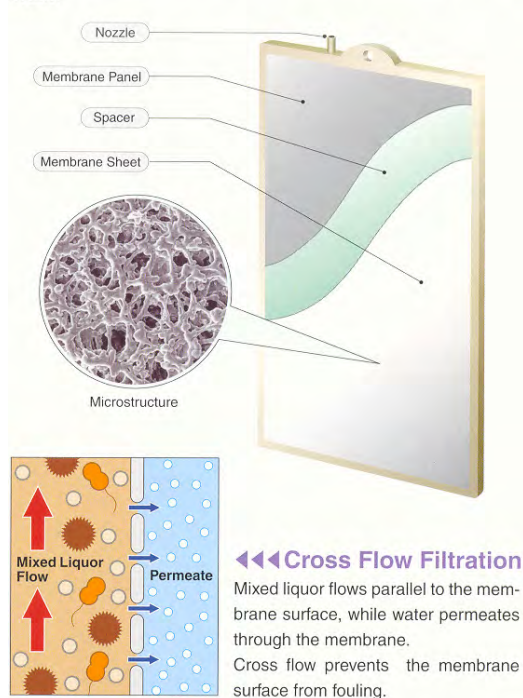
The new technology that we boast of has been field tested since 2003 and resulted in most all samples came back with outstanding data results. The criteria(s) for the Northwest Territories require the BOD₅ (Biochemical Oxygen Demand) to be less than 80 mg/L and TSS (Total Suspended Solids) to be less than 100mg/L. Having test data come back around 25/25 is usually achievable. Exceptional results are 10/10, but this and anything lower has been unachievable in a package treatment plant on a consistent basis.



THE MEMBRANE SYSTEM

Sewage is collected in above ground transfer stations and moved into a holding tank. There it is pumped to the treatment system and settling occurs in Primary Settling Tank #1. Oxygen is injected to this tank to begin the aeration process and eliminate any odors from the effluent. The sewage then runs to Settling Tank #2 where grease and most all solids separate. Gravity allows effluent flow from tank #2 through a fine screen to the flow equalization tank. Floats monitor the fluid level in this tank and a pump moves the fluid to the Anoxic tank. It is here where the aeration process is performed and the BOD5 is reduced to as little as possible. Floats again monitor the level of this tank, and it is finally pumped to the membrane tank.

Membrane sheets are ultrasonic-welded on both surfaces of membrane panel. They are made from chlorinated polyethylene with nominal $0.4\mu\text{m}$ pores. Permeated water goes through spacers and comes out by the nozzle.

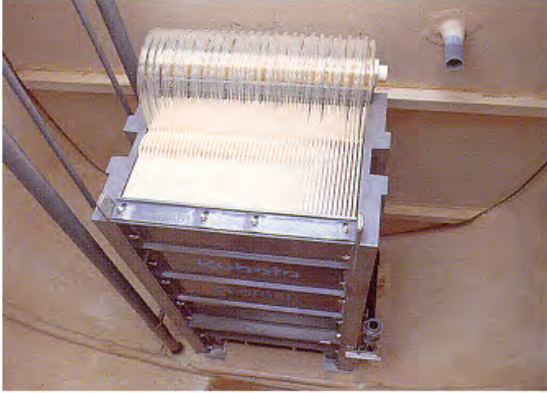


The membrane tank is where the final touches are put on the discharged effluent. In this tank the TSS is built up between 10,000 & 20,000mg/l. This thick “chocolate shake” looking liquor contains the bacteria and all Coli-forms from the sewage and treatment process. The bacteria are moved back into the Anoxic tank to continue consuming the sewage. The membrane which is best compared to a Reverse Osmosis filter is fine enough to remove virtually all suspended solids, Fecal & Total Coli-forms, and some discoloration.

This process is done by means of a vacuum pump sucking the effluent through the membrane, and ultimately discharging it through an irrigation field (wood chip field). Turbulent air is pumped across the bottom of the membrane which eliminates any plugging off of the pores on the surface.

A few times a month we will be traveling to the location, checking the system and collecting a sample for testing. Testing is required every two months, but we prefer to collect samples more often as it helps us build a better graph to show what the system is capable of. This information may also prove very useful in the future for other drilling programs in “sensitive areas”. Approximately every four weeks we will be performing a cleaning which involves taking the system off line for about three hours. This will not affect the daily operation of the plant.

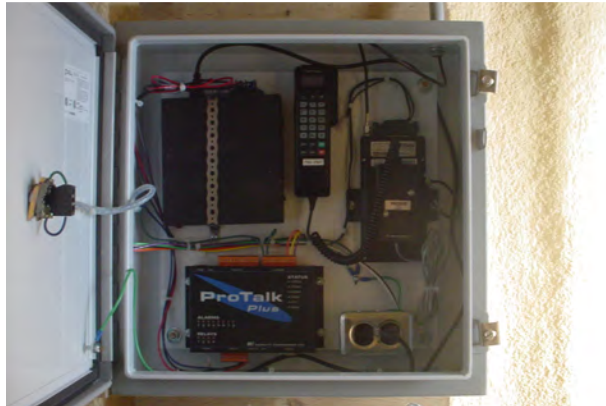
When the effluent is being discharged it travels through a flow totalizer and volumes are sent back to the PLC (Pro-logic Controller) to continue calculating daily flow. The PLC organizes and monitors all pump & compressor running times.



The picture to the left shows a membrane installed in a Waste Water Treatment System in a similar application to how our system is set up. The membrane consists of twenty-five individual plates, each about 8mm thick and together totaling about 90m² of area. When in operation, all you can see of the membrane system is the tops of the vacuum tubes, as it is submerged in the “chocolate shake/liquor”.

COMMUNICATIONS

With the operation of a treatment system like Wellco's, problems can arise from day to day operations. Because this is a temporary camp site, we rely on (or deal with) generator power, soft ground conditions and large volume fluctuations. Since having a full time sewage technician on site every day is not possible without significant costs, Wellco has found a way to automate our systems to tell us before we have a problem. Equipped with a cell phone interface and 6m antenna, our treatment system will call and alert us of high level or low level fluid alarms, and under voltage problems with the generator on site. In short, sewage does not leave our treatment system unless it has been treated. In the event of a problem, we know and can alert the camp staff before there is an environmental issue.



In the event of cellular communications not being possible from the site, we can equip the Waste Water Treatment Plant with a Satellite interface system to establish communications directly with our office.

*Please feel free to call our office at any time and ask any questions that you may have. We can be reached toll free through out Canada by calling **866-785-8500**. Our corporate sales office is located at #2300, 500-4th Ave Calgary, Alberta T2P2V6*

Appendix C Community Consultation

C.1 Overview

Consultations were conducted from February 12-18, 2008 in Tuktoyaktuk, Inuvik and Aklavik. In addition to these consultations, a further update to MGM operations including the proposed *Cuttings and Fluids Injection Facility* was conducted April 16-30, 2008. The purpose of the consultation meetings and the update meetings was to discuss Project plans, community concerns and proposed mitigations. Communities and local organizations were notified of the proposed Projects, schedules, and the technical details.

Community members and leaders were invited to participate in the evening information sharing and formal presentation session through advertisements posted on community bulletin boards. Emails and facsimiles were also sent to organized groups. The advertising was in place for one week prior to the consultation meetings. In addition, radio ads were transmitted locally prior to the meetings.

Separate meetings were held with the HTC's in each community, and a combined meeting was held in each community with community corporations, elders committees and the general public. Table 10-1 presents the meeting schedule and the number of attendees at each location.

For the meetings conducted in February, four MGM representatives attended the meetings with the HTC's and the community sessions. For the meetings conducted in April, there were two MGM representatives in attendance. The formal presentations consisted of a PowerPoint presentation with specific information on the proposed projects. Paper copies of the presentation were made available. The committees and community members asked questions during and after the presentation.

C.2 Meeting Schedule

Table C-1 below outlines the schedule of meetings conducted in February and April 2008.

Table C-1 Community Consultation Meeting Schedule

Date	Group	# Attendees	Location
12 Feb. 2008	Meeting with Inuvik Hunters and Trappers Committee	6 members	Hunters and Trappers Office, Inuvik
12 Feb. 2008	Joint Meeting with: Inuvik Community Corporation Inuvik Elders Committee Public	0 members 1 members 2 members	Ingamo Hall, Inuvik
13 Feb. 2008	Meeting with Aklavik Hunters and Trappers Committee	4 members	Hunters and Trappers Office, Aklavik
13 Feb. 2008	Joint meeting with: Aklavik Community Corporation Aklavik Elders Committee Public	3 members 1 members 3 members	Hamlet Office, Aklavik
18 Feb. 2008	Meeting with Tuktoyaktuk Hunters and Trappers Committee	3 members	Hunters and Trappers Board Room, Tuktoyaktuk
18 Feb. 2008	Joint meeting with: Tuktoyaktuk Community Corporation Tuktoyaktuk Elders Committee Public	0 members 0 members 0 members	Kitti Hall, Tuktoyaktuk

Table C-1 Community Consultation Meeting Schedule (cont'd)

16 April 2008	Inuvik Hunters and Trappers Committee	2 members	Hunters and Trappers Office, Inuvik
17 April 2008	Inuvik Hunters and Trappers Committee	5 members	Hunters and Trappers Office, Inuvik
17 April 2008	Tuktoyaktuk Hunters and Trappers Committee	5 members	Hunters and Trappers Board Room, Tuktoyaktuk
17 April 2008	Joint meeting with:		School Gym, Tuktoyaktuk
	Tuktoyaktuk Community Corporation	0 members	
	Tuktoyaktuk Elders Committee	0 members	
	Public	0 members	
28 April 2008	Joint Meeting with:		Ingamo Hall, Inuvik
	Inuvik Community Corporation	0 members	
	Inuvik Elders Committee	0 members	
	Public	0 members	
29 April 2008	Joint meeting with:		Hamlet Office, Aklavik
	Aklavik Community Corporation	0 members	
	Aklavik Elders Committee	1 member	
	Public	2 members	
30 April 2008	Aklavik Hunters and Trappers Committee	5 members	Hunters and Trappers Office, Aklavik

C.3 Issues and Responses

Discussions with communities have been captured as accurately as possible. To help provide context, in some cases the wording in the document may differ slightly from actual discussions with individual stakeholders and groups.

Table C-2 Consultation Concerns and Responses

Concern	Responses
Are all the access routes shown on the map going to be used?	No- this map is showing all possible access routes. We may use the same or different access routes for our various programs over the three seasons.
Barges could pose a safety hazard for people riding snowmobiles. Barges should have fences.	Thank you for this information. This will be addressed in our safety plan.
Local knowledge is very important. The Middle Channel will have very heavy ice flow during breakup- dangerous for barges- the side channels will be better.	Thanks for the information. Comment noted.
How many lakes will you take water from (Umiak)? There are lake trout and too much withdrawal will harm them.	We have to follow strict guidelines as to which lakes and how much water can be withdrawn from lakes, etc. e.g. DFO guidelines.
Where will the 5 th line on the Ogruknang 2D seismic be relocated to?	We don't know at this time if it will be relocated or where the 5 th 2D line may be relocated to. However it will be within the area outlined on the consultation map shown to you today.
What are you going to do with the trees from the 2D lines?	We plan on using a mulcher for the willows and small trees. For larger trees we will cut, deck and GPS the decking sites.
Will you avoid trees?	The seismic lines will meander around bigger trees, we plan to use mulchers on smaller trees and willows– these machines do less damage to the trees as they leave the roots intact unlike dozers. Dozer blades are kept off the ground by using “mushroom shoes”.
Make sure your crews are aware of the ice depth as your crews could fall in.	Thanks for the information. Comment noted.
Will you let the cabin and trapline owners know where the seismic lines are going if they are close by cabins.	As we did in our past programs, we plan on talking to the cabin owners if we are operating in close proximity to their cabins.
Are the wells going to be on land in the Umiak area?	They will most likely be on land.
Are there any overland access routes?	We try to build access roads on river channels as much as possible, however there are times that the shortest and safest route is overland to the drilling sites and seismic programs.
Who owns the manmade island?	We are presently confirming the ownership.

Table C-2 Consultation Concerns and Responses (cont'd)

Concern	Responses
Are you going to redredge to build up the island?	Restoration and repairs will be made to the existing island to make it suitable for a drilling site. This may include earthwork.
How do you abandon a well on a manmade island?	The casing would be filled with cement to plug the wellbore and then cut at an appropriate depth, likely just below river/sea bed depth. Standard procedures have been developed by the National Energy Board to permanently abandon wells
Will the manmade island well be a winter program?	Our plan is for it to be a winter program.
What is the water depth near the man made island?	We believe the water depth is 4 to 8 feet.
Who owns the barges?	NTCL and Horizon.
Our community has concerns about industry tying up barges needed to get supplies to the community before freeze-up. Shortage of tug boats is also a concern. However, this is NTCL's responsibility and as they are Inuvialuit owned they should service their communities first. The communities need to set up a meeting with NTCL to address this. There has thus far been plenty of discussion and cooperation with industry on this and none from NTCL.	Thanks for the information. Comment noted.
What inspections do you do while the fuel barges are staged and you are not actively working from the barges?	We do biweekly inspections – fly over by helicopter and look for problems and signs of leakage. We may or may not land the helicopter if all looks okay from above. If there was something that caught our attention, i.e. snowmobile or human tracks, we may land and perform a more thorough inspection.
What is the steel thickness of the fuel barges	We will find out from the barge suppliers and provide this information to the Aklavik HTC.
What is the age and conditions of the barges? When were they last inspected?	We will find out from barge suppliers and provide this information to the Aklavik HTC.
How much fuel does a barge hold?	It varies due to size. There are also compartments within the barge.
How fast do you use the fuel?	The amount of fuel staged for the drilling program should be enough to complete a program, therefore fuel would be onsite from the date the barges were staged to the end of a drilling program. The seismic programs have barges with fuel as well although it is likely that additional fuel will have to be trucked from Inuvik to complete the program. Fuel will be stored at the seismic staging area. A minimal amount of fuel will remain in the storage tanks of the barges and will remain onsite until NTCL / Horizon move the barges in the spring/summer.

Table C-2 Consultation Concerns and Responses (cont'd)

Concern	Responses
What precautions do you take when staging fuel barges? Do you use double hulled barges?	We only fill the inside tanks of the fuel barges thereby creating a “double” hull with the empty outside tanks providing a certain amount of protection should damage to the side walls of the barge occur. However, the floor of the barge would still be a single hull – we try to mitigate the risk of damage to the bottom hull by carefully selecting staging areas. We look for sandy bottoms that are free of rocks to stage barges. Even though double-hulled barges would provide better protection against spills – there are no double-hulled barges available to us – they do not exist.
If the ice is frozen under a fuel barge and there is a leak, can you see it and would the fuel escape?	If there is any water present under the barge and a small leak was present, the water would tend to leak inward keeping the fuel in the tank – fuel is lighter than water. If there was all ice under the barge then that ice may form a barrier and help prevent the fuel from escaping but there is some risk that the fuel could leak and we could not see it under the ice. We try to mitigate this by staging the barges on sandy areas as discussed in previous question.
Can you use something other than barges, e.g. enviro tanks?	It would take a lot of enviro tanks to store the fuel required. These enviro tanks would have to be stored on the deck of the barges - we would likely need more barges to accommodate them. There may also be more risk hauling/storing fuel on the deck of a barge i.e. easier access for anyone going by, more hauling/handling of very heavy loads if we move the tanks off the barge decks.
Would you consider hauling half the diesel after roads allow?	It would not be a preferred option. There is likely more risk to transporting large amounts of fuel – more traffic on the ice road, heavy loads on the ice road – small chance of going through ice causing a spill, etc.
Why not have security on site to check fuel etc?	For the short period between mooring the barges and when the crews move in, there is a safety issue as we cannot have just one or two security people working in a remote location. We do have inspections from the air.
What are your cleanup capabilities? How much could you clean up? Are all people on site trained in spill response? Who is?	We have spill containment on board. Not all staff are trained in spill response however, we have trained personnel on site. We have the ability and capability to bring in additional staff and equipment on short notice.
Do you fly over the land looking for dens, plants, etc.	Yes, there are archaeological and biophysical studies done during the spring/summer/fall to identify rare plants, gravesites, etc. Marsha Branigan (GNWT) flies over the proposed access routes and project areas to identify any bear dens.
Can you notify the HTC's prior to flying helicopters, scouting, etc. so we can answer questions from cabin owners, etc?	Yes. We have in the past season and it seems to work well.

Table C-2 Consultation Concerns and Responses (cont'd)

Concern	Responses
The summer ice pad for storing a rig over the summer (Umiak)- has anyone proved it will work? What happens if rig tilts? Could you provide more information on the summer ice pad – the Aklavik HTC would prefer we do not run an experiment?	There is history that it worked in Alaska.
Alaska is different with different rules and climates.	Once we have a plan and design finalized we can discuss it with the Aklavik and Tuktoyaktuk HTCs if so desired.
Did Encana try it? Was that an Encana design?	As part of our planning and design, we will be checking where else it was tried and by who.
There is no proof that summer ice pads will work	If we feel that ice pads will not work we would not contemplate using them.
Wood chips are sometimes also used as insulation on the tundra.	Thanks for the information. Comment noted.
Can you take pictures before and after of the drilling site?	We will endeavour to have pictures of drilling sites (before and after) as part of our presentations.
Can the HTC attend an inspection of the drilling site after we are finished?	This should not be a problem provided all the safety and regulatory requirements are met and there is room in the transport equipment.
Are you using biodegradable grease in the water pumping process?	We will find out and provide this information to the Aklavik HTC.
Will you use berms for storage of fuel on land?	We would likely use Envirotanks for fuel storage on land.
Can the drilling mud be dealt with in the Delta? Will it come to the surface such as a lake, far away from the well it is injected into?	The methods used in the past and in other areas regarding pumping back down the well or using old dry holes was discussed. The material would be injected into formations that are far below any lakes, etc. The formations selected will provide a permanent seal and keep the material trapped. There are strict regulations governing injecting drilling mud and cuttings down a hole.
When you build ice roads the extra ice - may reduce water flow and affect fish. The DFO may have studied this before. The E channel usually gets good whitefish migration- would they be effected?	We will check with the DFO but it seems unlikely as the Inuvik to Aklavik/Tuk ice roads are probably the thickest and there have been no adverse effects noted.
Are you treating sewage- often it doesn't pass specs?	We are treating our sewage. If it does not pass it is trucked to the Inuvik Lagoon. We do not spray to land if it does not pass specification.
Are all the programs shown planned for next year?	What we are showing are all the new proposed programs we may want to do over the next three seasons.
What kind of explosives will you be using for seismic?	We may be using explosives and/or vibrosis depending on terrain, equipment availability, etc. Typical dynamite charges would be 1 -3 kg at 12 – 15 m in depth.

Table C-2 Consultation Concerns and Responses (cont'd)

Concern	Responses
What are you doing to prevent harming or killing fish with dynamite seismic?	If required, we will conduct pressure testing per DFO requirements. This is currently being done on North Ellice 3D with excellent results.
You must have clean stream / creek crossings free of willows, branches, twigs and other debris as this impedes the flow of fish.	We will continue to reinforce this point with our operators in the field.
Where you propose to store your rig (Umiak), the ground is high and not prone to flooding.	Thank you for this information.
What kind of vehicles will be travelling on the ice?	Tracked vehicles, pick up trucks and perhaps semis on main access routes.
What are the crosshatched areas on the map?	These are protected areas.
When will we see maps showing actual drill hole locations?	Additional and more detailed information will be in the Project Descriptions. Clarification – actual drill locations will not be available until after the summer field assessment is complete
You should know there is a lot of gravel in your proposed "Area 4". (Umiak)	Thank you for this information.
Industry is good and bad up here. Jobs are good, MGM is responsive to needs & concerns of community.	Thank you.
Be advised, according to the Screening Committee, PD's are to be sent directly to the HTC offices. Please provide Tuktoyaktuk HTC with 7 copies.	Thanks for the information. Comment noted.
Do you monitor and record the amount of cuttings and fluid that is pumped down an injection well?	Yes, the amount of cuttings and fluid injected will be recorded.
How much mud and cuttings come out of a well?	Each well is different (depth, rock type, drill size, hardness of the rock, etc.) a rough number would be round 2000 cubic metres.
Can you just pump it (cuttings and mud) down the hole?	Yes, either back down the wellbore into a formation or down another wellbore into a formation. Again, this depends on the underground rock formation, equipment, geology, regulatory requirements, etc.
How deep is the permafrost?	We are not sure as it varies in depth. We drill through the permafrost and set casing at a proper depth as determined by engineering and regulatory requirements.

Table C-2 Consultation Concerns and Responses (cont'd)

Have you heard of any cuttings or fluids coming back up to the surface in other places?	Not to our knowledge. The formations (soft rocks) into which the cuttings and fluids are pumped are a long way below surface and the formations are selected based on their ability to accept and store cuttings and fluids. There are regulations that need to be followed in order to inject cuttings and fluids.
Would you use an existing well or drill a new well for fluid and cuttings injection?	We would have to look at a lot of different factors such as proximity to our drilling program, access, well ownership, type of formations downhole, etc. Our preference would be to use an existing well.
How much cuttings and mud (number of wells) can you put into an injection well?	Preliminary studies show it is possible to inject more than one well and potentially up to approx. 100 wells worth of cuttings and mud into a dedicated injection well.
How much time does it take to get an injection well operational?	It depends on the regulatory approval process, availability of equipment, access to the well site, etc. We are hopeful that we could have an injection well in place for this coming drilling season.
You talk about an injection well. Any studies on if it works here? We are concerned about making our land a dumping site.	I don't know if injection has been used here. It is common practice round the world to use injection wells. The cuttings and mud are from wells on Inuvialuit land and will be injected back into wells on Inuvialuit land.
What is the material that goes down the hole?	Cuttings and fluid from a drilling operation.
You have drilled five wells and trucked the cuttings south from the last three. Aklavik HTC would like more information before injection would be okay with us. We would like to see more studies and clarification and more consultation on injection wells. Maybe you should have the NEB here with you. We probably won't be able to have another HTC meeting (quorum) until August as we lost one member and everyone is out traveling.	MGM will submit a Project Description for an injection well, and continue to work with the Aklavik HTC to further inform them on the injection process. MGM understands that it will be difficult for the Aklavik HTC to have a quorum at their meetings in the near future, so MGM will provide the Aklavik HTC with additional public information on the injection process including general cuttings and fluid data via your office for distribution to your committee members.
Injection beats the heck out of sumps anyways.	Thank you for your comment.

Appendix D Environmental Protection Plan

D.1 General Measures

- MGM and contractors will adhere to all mitigation proposed in regulatory applications and all project approval conditions.
- All permits, licenses and approvals and key operating plans, including spill and emergency response plans will be retained on site for the duration of the Project.
- MGM will attempt to adhere to the project schedule, or will contact regulatory authorities if a significant change in schedule is necessary.
- MGM will utilize wildlife and environmental monitors. Monitors will report issues/incidents to the Drilling, Construction and CFI Supervisors.
- Consultation with regulators, Hunters & Trappers Committees and Community Corporations will continue as necessary throughout the Project.
- A project kick-off meeting will be conducted with MGM representatives, contractors, regulators and construction and operational personnel. The meeting will review environmental information and expected mitigation measures. These measures will again be reinforced during the onsite Orientation presentations.
- There will be ongoing communication of environmental concerns to team members.

D.2 Working Practices

- Operations will be confined to areas for which a permit has been issued.
- The working area will be kept clean and tidy, and all debris, machinery, parts, etc will be removed at the end of the Project.
- All project activities on land will occur under frozen ground conditions to protect vegetation and underlying permafrost from disturbance.

D.3 Communication

- A meeting will be held with Indian and Northern Affairs Canada (INAC) in Inuvik at least 48 hours before the start of construction.
- INAC will be provided with contact details for the Project managers and alternates.
- Weekly progress reports will be filed with INAC.
- At least 10 days prior to completion, INAC will be advised of plans for removal of equipment and materials, and final cleanup and restoration.

D.4 Disturbance to Soil

- Ice pad thickness at the CFI facility will be a minimum of 15 cm, unless activity is occurring on pre-existing pads.
- Taller vegetation will be walked down using low ground pressure vehicles, or be trimmed if walking down is not feasible or would result in unacceptable breakage/damage of vegetation.
- Rutting will be avoided. Vehicle movements will be suspended if rutting occurs.
- Mushroom shoes or boots will be used on bladed equipment.
- Equipment will be unloaded using steel ramps or packed snow and ice ramps which will protect channel banks.

D.5 Disturbance to Permafrost

- If clearing of surface layers takes place (e.g., following a spill), the surface will be immediately reinsulated using uncontaminated cut vegetation and soil.

D.6 Abandonment and Reclamation

- Upon completion of the injection operation, the well will be capped and temporarily suspended as per National Energy Board regulations.
- Upon decommissioning, the camp and CFI facility will be inspected for contamination and documented.
- All equipment, survey stakes and construction debris will be removed.
- Assessment and remedial work will be carried out on disturbed areas as necessary.
- The project area will be inspected in summer.
- Where vegetation is removed or effected, a native seed mix that is consistent with localized naturally-occurring vegetation may be applied to enhance reclamation

D.7 Fuel Storage and Handling

- The use of hydrocarbon-based fluids (e.g., fuel, anti-freeze) will be monitored and related wastes will be disposed of in an approved facility.
- Specifically trained individuals will be tasked with refuelling during the construction and drilling operations in order to ensure consistency of refuelling procedures and to minimize potential spills.
- All vehicles will require a drip pan when being fuelled or when stationary for more than two hours.
- Fuel storage areas will be clearly marked.
- All outlets on containers will be sealed except for the one in use, with the exception of the vents.
- Storage containers will be regularly inspected for leaks, and any leaks will be repaired immediately.
- Spill kits and drip pans will be available at all refuelling points.

D.8 Accidental Spills

- MGM will have a dedicated Emergency Response and Spill Contingency Plan in place and will conduct emergency drills and exercises throughout the Project to ensure preparedness in the unlikely event of an incident.
- Any leaks or spills will be cleaned up immediately, be recorded and/or reported if considered reportable under legislation or permit conditions, the cause of leak corrected, and any required remedial actions undertaken.
- In the event of a major fuel spill, MGM will implement its Emergency Response and Spill Contingency Plan (Section 14). Both MGM and the Mackenzie Delta Spill Response Corporation have personnel trained in spill response that can be mobilized in the event of an incident.

D.9 Wastewater Handling and Disposal

- Wastewater from the sewage treatment facility will be discharged upon meeting regulatory discharge criteria to an approved location.
- No floating solids, garbage, grease, free oil or foam will be discharged.
- Wastewater that cannot meet approved discharge criteria will be hauled to Inuvik Wastewater Treatment Facility, upon receiving prior authorization from the Town of Inuvik or a wastewater treatment facility at another camp for treatment and disposal.

D.10 Additional Conditions

- The wells will not be constructed within 100 m of a permanent waterbody.
- All vehicles and equipment parked for more than two hours must have a drip tray, haz-mat or be 'diapered'.

D.11 Water Withdrawal

- Daily water use will not exceed 1500 m³.
- Water will be withdrawn from Mackenzie River channels.
- All water intake hoses will be equipped with a screen mesh size of 2.54 mm. Alternative mesh sizes will only be used if they comply with calculations outlined in DFO's Freshwater Intake End of Pipe Fish Screen Guidelines.
- The suction hose will be suspended in the water column to avoid disturbing bottom sediments.

D.12 Disturbance to and Protection of Wildlife

- Wildlife and Environmental Monitors will be utilized and are expected to bring relevant issues to the attention of the CFI facility supervisors.
- Air traffic will be minimized, and will be confined to periods specified in project description, applications and approvals. Further, air traffic will comply with protocols and flight guidelines developed for the Inuvialuit Settlement Region.
- Wildlife will not be harassed.
- MGM will comply with ENR's 2005 Bear Encounter Response Guidelines (Appendix F) and its own Wildlife Protocol, which incorporates specific recommendations from the Department of Environment and Natural Resources and Industry best practices.

D.13 Disturbance of Grizzly Bears and Polar Bears

- MGM will work closely with ENR to identify active denning sites in advance of operations commencement, and avoid these areas.
- Wildlife and environmental monitors will be employed
- Bear Protocols, including ENR's 2005 Bear Encounter Response Guidelines (Appendix F) will be implemented.
- Camps and facilities containing potential attractants such as food or petroleum products will be bear proof.

D.14 Disturbance to Migratory Birds

- Areas with high concentrations of nesting, brood-rearing, moulting or staging birds (including the lesser snow goose nesting colony) will be avoided.

D.15 Protection of Heritage and Traditional Land Use Sites

- Any sites identified during the Project will be recorded, and will be avoided by project personnel and equipment. Undocumented sites will be registered with the Prince of Wales Northern Heritage Centre Registry.
- An archaeological assessment of the proposed Project area was undertaken in 2007 and no cultural or archaeological significance was found.
- If archaeological or traditional use sites are uncovered, work will be suspended in this immediate area, and the appropriate regulatory agency notified.

D.16 Solid Waste Disposal

- An onsite waste segregation system will be used for the storage of metals, plastics, refined oils and oily waste.
- Separated recyclable materials and plastics will be hauled to an appropriate handling facility for recycling or disposal upon Project completion.
- The camp will have an incinerator for disposal of combustibles and food wastes. Garbage and debris will be burned daily.
- Camp incinerator ash will be trucked out and disposed of at an appropriate disposal facility. Waste oil will be recycled.
- An evaporator will likely be used for the management of contaminated snow and ice, and rags and absorbent pads.

D.17 Waste Management - General

- Waste, drill cuttings, drill fluids, sewage and wastewater will be stored at least 100 m from any water body, and be bermed or otherwise contained.
- No waste, silt or soil will be left on the ice where it may enter the water after spring break up.
- A Waste Management Plan will be tailored for the Project to identify wastes, handling and storage practices, preferred management and disposal options as well as approved disposal facility contact information.

D.18 Drilling Waste Management

- Drilling waste and cuttings fluids may be stored in the temporary storage area until ready for injection.

Appendix E Emergency Response Plan



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MACKENZIE DELTA EMERGENCY RESPONSE PLAN

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INTRODUCTION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

PURPOSE OF THIS PLAN

PURPOSE

This Emergency Response Plan (ERP) documents the procedures and processes for the initial and ongoing response to an emergency that might occur during construction, drilling, seismic operations, and logistics activities associated with MGM Energy Corp.'s (MGM Energy) work in the Mackenzie Delta area.

OBJECTIVES

The objective of this plan is to prepare MGM Energy's employees, consultants, and contractors, to respond promptly to emergencies that might arise during the course of their field work, particularly during the company's drilling and seismic programs.

The objectives of the specific emergency response plans that have been developed for MGM Energy's activities in the Mackenzie Delta are to:

- ensure the safety of personnel directly involved with the operation and the response
- assist personnel in assessing the level of threat posed by potential or actual emergencies, and to take prompt action to protect themselves, others, and the environment
- communicate with MGM Energy's management, contractors, local communities, regulators, government agencies and the other interested parties in a timely manner

SCOPE OF THIS PLAN

The plan:

- links to the planned work programs and activities expected to be undertaken by MGM Energy in the Mackenzie Delta Region – as further described in the MGM Energy Corp. Project Descriptions.
- identifies the types of emergencies that might arise in the course of the work

INTRODUCTION**PURPOSE OF THIS PLAN**

SCOPE OF THIS PLAN (cont'd)

- describes how emergencies are assessed and categorized according to their expected severity
- outlines the emergency response organization and the roles of key team members
- provides step-by-step procedures for responding to emergencies
- outlines the support services provided to those involved in an emergency
- identifies the requirements for notifying, reporting, and following up emergencies with corporate and external parties

MGM POLICIES

Worker Health, Safety and Environmental Stewardship are integral components of MGM Energy's values and business strategies. Figure 1-1 shows MGM Energy's Health and Safety Policy and Figure 1-2 shows the Environmental Stewardship Policy.

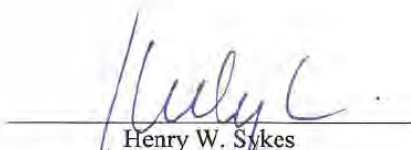



HEALTH & SAFETY POLICY

Safety is an integral part of the business of MGM Energy Corp. Prevention of all incidents that may cause death, bodily harm, illness, or property loss is of the highest importance to MGM Energy.

To fulfill this principle, the leadership of MGM Energy believes that:

- No job is so urgent that it may be undertaken without identifying and controlling hazards and taking the precautions reasonable and practical under the circumstances, to manage operational risk and prevent injury or occupational illness.
- All work activities undertaken at the direction of or on behalf of MGM Energy will comply with all applicable Federal, Territorial, local laws and regulations.
- All workers, contractors, consultants, and suppliers engaged in activities on behalf of MGM Energy will do everything reasonable and practical to protect the health and safety of all individuals present at the work-site.
- To ensure a safe, productive and respectful work environment at all work-sites and for those doing work for MGM Energy off-site, the use, sale, transfer or possession of alcohol, illegal drugs or other substances, including non-prescription and prescription medications for uses other than the intended use, is strictly prohibited.
- To ensure a respectful and productive work place environment, harassment of any form will not be tolerated.
- MGM Energy's health, safety, and environmental management system provides a basis for the protection of all workers, visitors and members of the public at MGM Energy's work-sites. MGM Energy's HSE management system is aligned with the Petroleum Industry Guiding Principles for Worker Safety and flows through to MGM Energy's approved safe work procedures and codes of practice.


Henry W. Sykes
President


Gary L. Bunio
Vice-President, Chief Operating Officer

March 6, 2007

Figure 1-1: MGM Energy's Health and Safety Policy

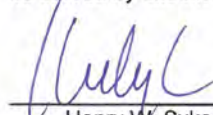



ENVIRONMENTAL STEWARDSHIP POLICY

Environmental stewardship is a key component of MGM Energy Corp's. ("MGM") values and business strategy. Environmental Stewardship means being responsible for the exploration and development of natural resources to ensure they are sustainably managed for current and future generations. MGM will strive to manage and minimize the impact of its operations on the environment and will:

- Make environmental stewardship a significant component of the corporate decision making process.
- Provide leadership and resources to allow employees and contractors to meet MGM's commitment to environmental stewardship.
- Develop and implement HSE Management Systems with supporting programs and practices that are built on the concept of sustainable development.
- Work cooperatively and in consultation with all stakeholders to develop plans and operations that reflect our commitment to environmental stewardship.
- Apply economically viable, best proven technology and management practices to advance environmental stewardship in our work.
- Design, construct, operate, decommission and reclaim projects and facilities in compliance with applicable legislation and in a manner consistent with our commitment to environmental stewardship.
- Respond promptly and effectively to emergencies to minimize adverse impacts.
- Measure, audit and report annually to MGM senior management on the company's environmental performance.

MGM believes that our interests, and those of the communities in which we operate, will best be served by effective stewardship of our shared environment.


Henry W. Sykes
President


Gary L. Bunio
Vice-President, Chief Operating Officer

August 15, 2007

Figure 1-2: MGM Energy's Environmental Stewardship Policy



INTRODUCTION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

PROGRAM SUMMARY

PROPOSED PROGRAMS

Scope of Programs

MGM Energy is actively exploring for hydrocarbons in the Mackenzie Delta Region. All exploration seismic and drilling operations in the Delta are covered within the scope of this Emergency Response Plan (ERP). The planned programs are further described in the MGM Project Description documents. Activities covered under this ERP include:

- Summer Field Assessment and Advance Barge and Staging Projects
- West Delta Drilling, Completion and Testing Project 2008-2011
- Cuttings & Fluids Injection Facility at Aput C-43
- Drilling, Completions and Testing Projects at prospective locations;
- Seismic Programs on prospective lands in the Mackenzie Delta Region.

Program Schedule

Regulatory agencies and communities will be informed of the extent of the work, the schedule and the logistics plans before any planned activity in any given year begins. Figure 1-3 outlines the project areas.

Figure 1-4 shows a typical drill site schematic.



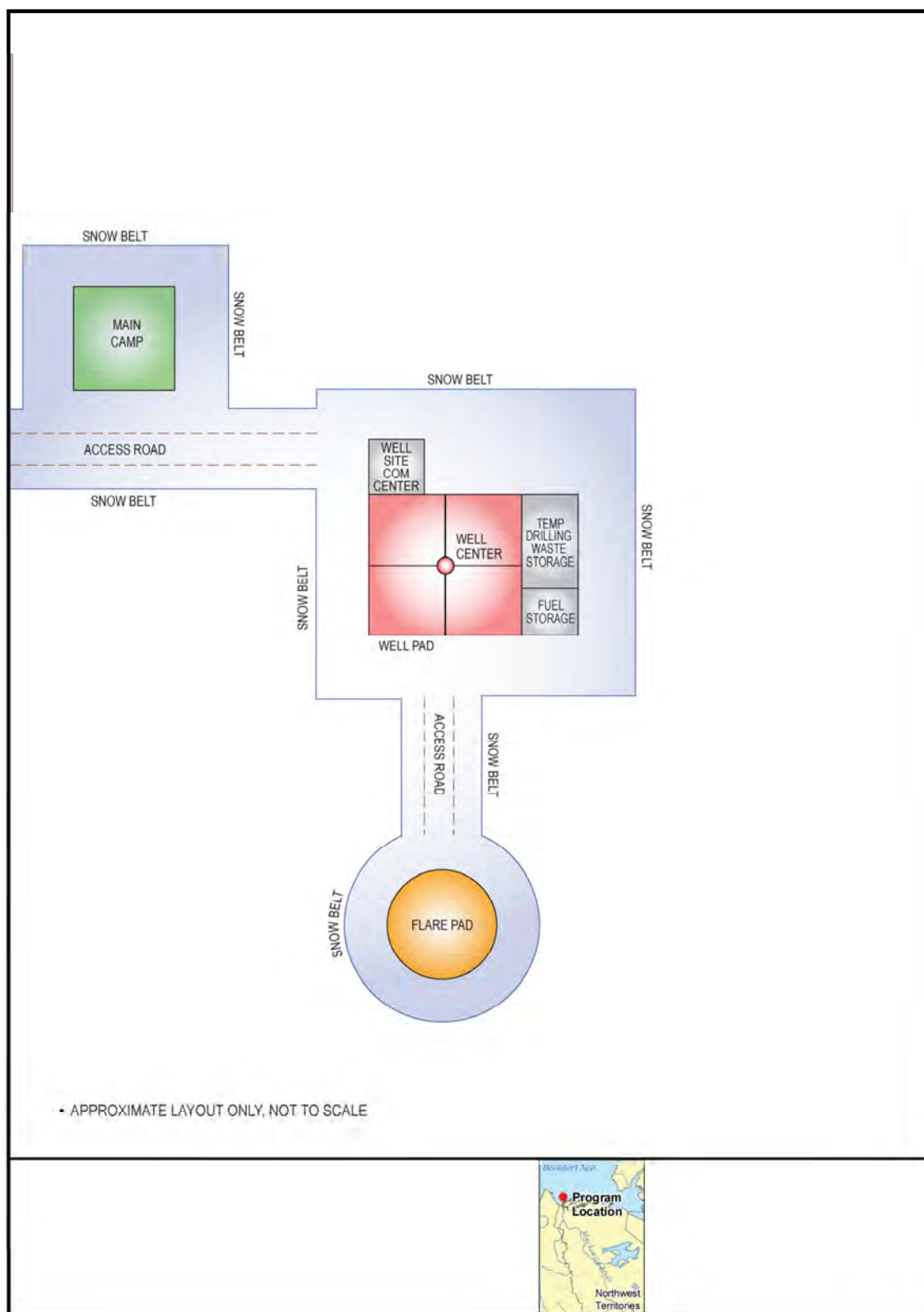


Figure 1-4: Typical Drill Site Schematic



EMERGENCY ASSESSMENT

MACKENZIE DELTA
EMERGENCY RESPONSE PLAN

LEVELS OF EMERGENCY

SCOPE

An emergency is a sudden unplanned physical situation or event with actual, or the potential for, human injury, damage to the environment, equipment or property, or a combination of these. An emergency requires immediate action to control and to mitigate the negative consequences of the event, to the extent possible.

CATEGORIES OF EMERGENCIES

Emergencies are categorized using **Table 2 -1**. Each level defines the escalating severity and requirements of the response, including indicating the:

- severity of the situation and the potential hazard to workers, responders and others
- ability of the operator to respond and control the situation with on-site resources
- requirement for off-site supplemental response resources, both internal and external
- requirement for internal and external notifications and reporting
- requirement for public communications

EMERGENCY DECISION PROCESS

Figure 2 -1 summarizes the major decisions made for each level of emergency, and the major steps taken to control the emergency. For further information on the response taken for specific emergencies, see Section 5: Emergency Response Procedures and Section 6: Spill Prevention and Response.

EMERGENCY ASSESSMENT

LEVELS OF EMERGENCY

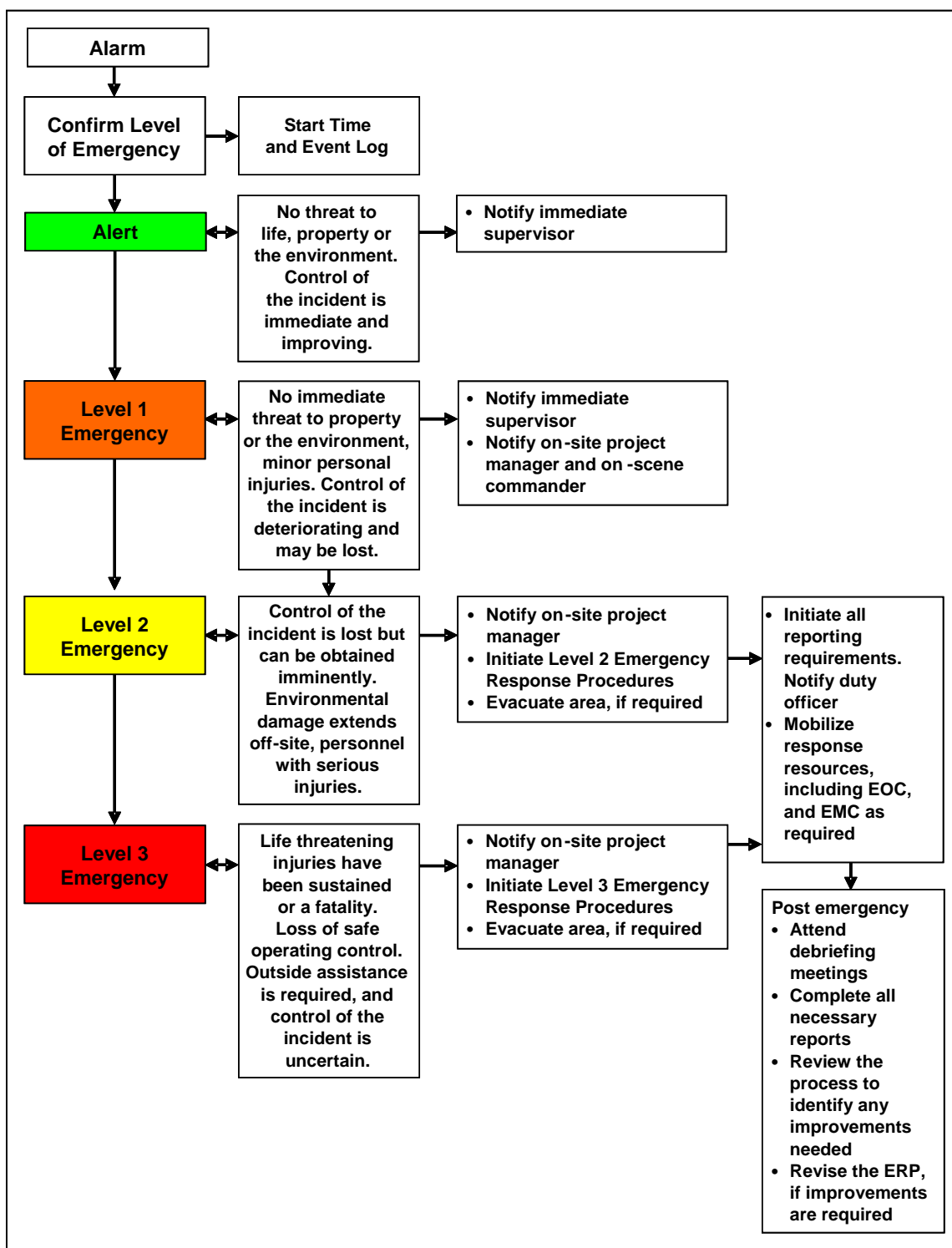


Figure 2-1: Emergency Decision Flowchart

Table 2-1: Levels of Emergency

Under all circumstances, ensure the protection of life safety, follow the response & internal / external notification actions as outlined in your regional emergency plan, and document your activities.

Level	Definition / Criteria	Examples (serve as examples only and may not reflect regional or hazard-specific risks or threats)	Typical Internal Notification / Initial Activation (is a minimum example of notification types & communications)
ALERT	On-site incidents where immediate control of the hazard is achieved through the application of normal operating procedures which result in the progressive resolution of the situation. Meets all of the following: <ul style="list-style-type: none">immediate control of the hazard is established using on-site resourcesinjuries to on-site personnel that are of a minor naturepublic safety is not threatenedenvironmental impacts are confined to the siteall control and relief systems and equipment are functioning normally	<ul style="list-style-type: none">any controlled situation, outside of normal operating conditions, which has the potential to impact well, pipeline, or facility operations, and has the potential to escalate in severityminor injuries to personnel requiring first aid treatments onlysmall volume spills and releases (<100 L) which are confined to the sitepublic concern, inquiry, complaint or observation of an incident that does not require or result in the escalation of the incident beyond an alert level such as noise, dust, and odour complaintswildlife encounters – wildlife in the vicinity, no threat posedpreliminary (early warning) weather reports that may threaten operations	Notification: Site MGM Supervisor Plan / Team Activated: Regional Emergency Response Plan * Internal Incident report is generated. * <i>discretionary activation by Local Supervisor or Incident Commander dependent on type and magnitude</i>
LEVEL 1	Onsite incidents where control of the hazard has been obtained but the potential exists for the imminent loss of control if conditions deteriorate. Meets any of the following: <ul style="list-style-type: none">immediate control of the hazard has been established using available resources; however, conditions are not improving and / or resources are being depletedinjuries to on-site personnel are of a minor naturepublic safety is not threatened; however there is, or may be, a public perception of moderate risk to human health or the environmentenvironmental impacts are confined to the site and have limited potential to impact off-siteall control and relief systems are functioning normally	<ul style="list-style-type: none">any controlled situation, outside of normal operation conditions, where the ability to maintain control using on-site resources is in question or off-site resources are required to maintain control ,such as a fire or explosion where imminent control of the fire is probableinjuries to personnel requiring on-site medical attentionreportable spills and releases (>100 L) that are contained onsite, but have the potential to extend off-site / off platform. Also includes spills >20 L on ice surfaces (off lease)any incident requiring the advisory notification of the public of a non-routine, on-site occurrenceescalating weather threats which may threaten personnel and operationsoverdue vehicles,minor motor vehicle incidents – without injuries requiring evacuation, damage <\$10,000Marine Vessel on board emergency brought under control immediatelyWildlife encounters – animals adjacent to site showing threatening behaviorpotential social / political unrest, labour disputes	Notification: Site MGM Supervisor Duty Officer - Incident Commander Corporate Emergency Manager* Plan / Team Activated: Regional Emergency Response Plan Incident Command Team * <i>discretionary notification & activation by Incident Commander to Emergency Manager based on type and magnitude of incident and if regulatory, public or media contact has been made within 24 hours</i>
LEVEL 2	An incident where control of the hazard has been lost but where imminent and / or intermittent control of the hazard is possible. Meets any of the following: <ul style="list-style-type: none">control of the hazard has been lost; however, through the application of available resources intermittent control is being obtained or hazard control is imminentinjuries to on-site personnel are of a Serious naturepublic safety is not threatened, however, there is or may be a public perception of significant risk to human health or the environmentenvironmental effects extend offsite and are resulting in minor or short-term detrimental impactssome control and relief systems are not operational	<ul style="list-style-type: none">any uncontrolled hazard where the ability to regain control using available resources is imminent or intermittent control is being achieved using available resources such as pipeline integrity failureinjuries to personnel which have resulted in, or are likely to result in, a lost time (beyond the day of the occurrence) injury or short term health impact.Illness or injury requiring medical evacuation to external treatment centerspills or releases extend off-site and are, or will, result in minor or short-term detrimental impactsany incident requiring the notification of the public of a potential or imminent threat to human health or the environment, such as a pipeline rupturesome control and / or relief systems are not operationalvehicle or equipment damage >\$10,000 - <\$100,000wildlife encounters – aggressive behavior demonstrated, or attack occursimminent security threats, social / political unrest, and labour disputes, verbal or written threatssevere weather which threatens personnel and / or operations (>12 hours)overdue charter aircraft, or emergency landingmarine vessel in distress	Notification: Site MGM Supervisor Duty Officer - Incident Commander Corporate Emergency Manager Public / Media Plan / Team Activated: Regional Emergency Response Plan Incident Command Team Emergency Management Team * * <i>discretionary notification & activation by Emergency Manager to Executive Lead based on type and magnitude of incident</i>
LEVEL 3	An incident where control of the hazard has been lost, imminent control is not possible and public safety is, or has the potential, to be threatened. Meets any of the following: <ul style="list-style-type: none">control of the hazard has been lost and regaining control is not imminently possibleon-site personnel have sustained injuries with a Major (or catastrophic))public safety is, or has the imminent potential to be, jeopardizedenvironmental impacts are significant, extend off-site and have the potential to result in long-term environmental degradationkey control and relief functions have failed and are not operating correctly	<ul style="list-style-type: none">any situation where control of a hazard has been lost and regaining control is not imminently possible; includes loss of well control or failure of essential well control equipmentinjuries to personnel which have or are likely to result in permanent disability, long term health impacts, or death, immediate evacuation for treatment requiredany incident requiring the evacuation or sheltering of public such as or a catastrophic facility fire or loss of well control, or fire involving critical equipment such as camps, camp generators, fuel tank farmsspills or releases extending off-site which are, or are likely to, result in significant and substantial detrimental impact to the environmentkey control and relief systems are not operationalact of terrorism, violence, threats of war, social / political unrestsevere weather impacting personnel and / or operations for >48 hoursmissing or downed aircraft (confirmed), missing personmarine vessel declares “may day” emergency	Notification: Site MGM Supervisor Duty Officer - Incident Commander Corporate Emergency Manager Public / Media Sr. Management Team Plan / Team Activated: Regional Emergency Response Plan Incident Command Team Emergency Management Team



EMERGENCY ASSESSMENT

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

NOTIFICATION

RESPONSIBILITY

In all emergencies, anyone noticing the emergency is required to notify their supervisor or on-site contact immediately. The supervisor, in collaboration with MGM Energy's on-scene commander, will:

- assess the severity of the emergency
- initiate or escalate response actions
- implement required internal and external notifications

External notification and reporting requirements are listed in the specific emergency procedures, see Section 5, Emergency Response Procedures and Section 6, Spill Prevention and Response.

INTERNAL NOTIFICATION REQUIREMENTS

The first person observing the emergency must notify the supervisor promptly. If the person or alternate being contacted is not available at the time contact is attempted, the next person up the chain of contact should be contacted.

On-site supervisors may, at their discretion, escalate the contact process for Level 2 emergencies if they believe that the situation will probably worsen. Use the incident report forms and log sheets in the form section of this document.

Figure 2-2 summarizes the notifications for level 1, 2 and 3 emergencies.

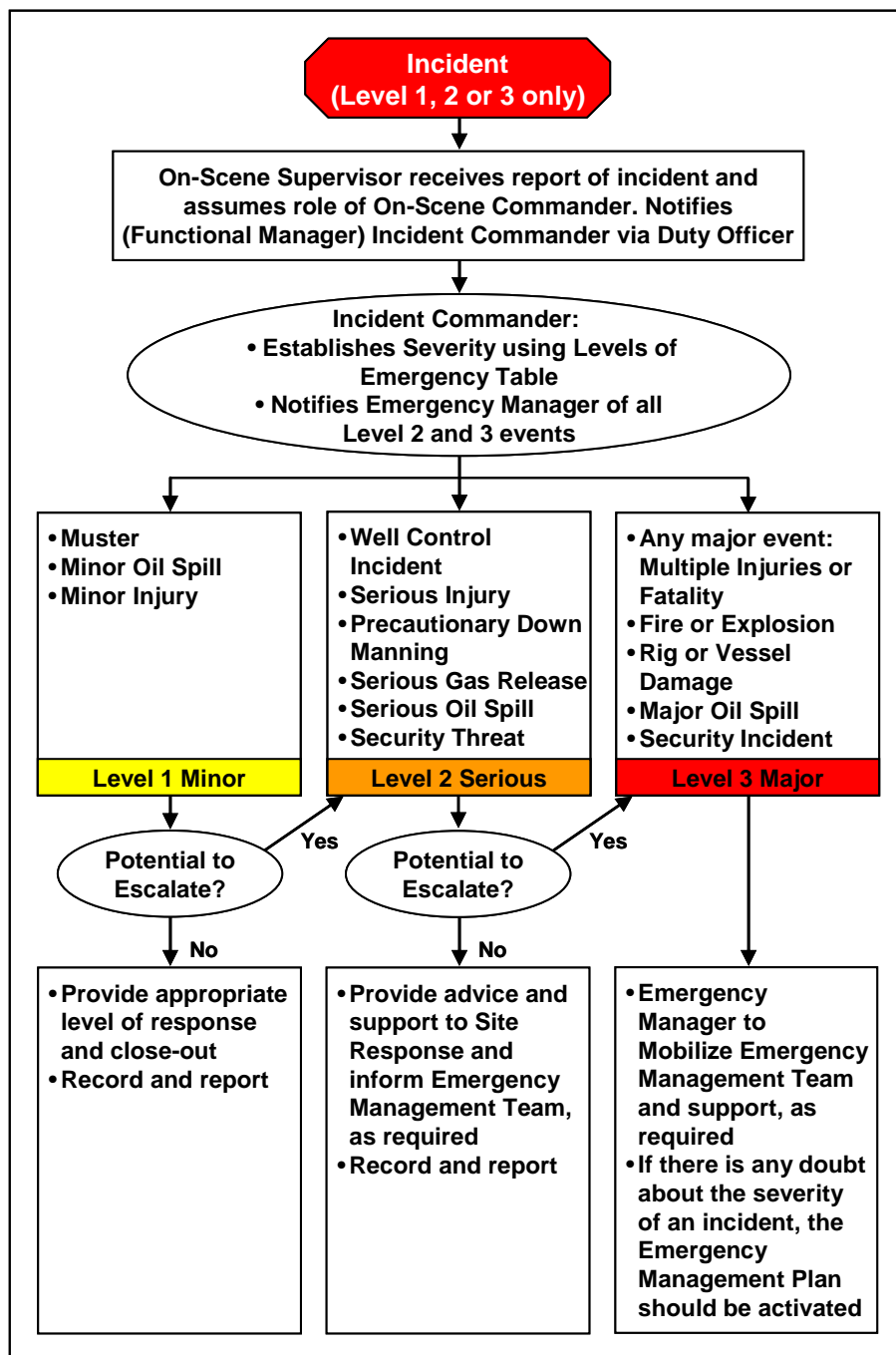


Figure 2-2: Incident Notification Flowchart



Section 3.1 EMERGENCY RESPONSE ORGANIZATION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE TEAM

SCOPE

MGM Energy's emergency response team (ERT) provides emergency response services from two locations:

- an off-site Calgary emergency management team (CEMT), operating from the Emergency Management Centre in the Calgary office, provides support services to the on-site team during an emergency
- an on-site emergency response team (OERT), operating from the Emergency Operations Centre, provides on-site response services

The Emergency Operations Centre (EOC) for construction and drilling operations will initially be at the construction base camp until drilling operations begin. Afterwards, the EOC will remain at the drilling lease offices for construction, drilling and testing operations.

The EOC for seismic operations will be at the seismic base camp or Aguila's offices in Inuvik, depending on the nature of the emergency.

Figure 3-1 shows the organization of MGM Energy's emergency response team. For the roles of the CEMT, see Section 3.2. For the roles of the OERT members, see Section 3.3.

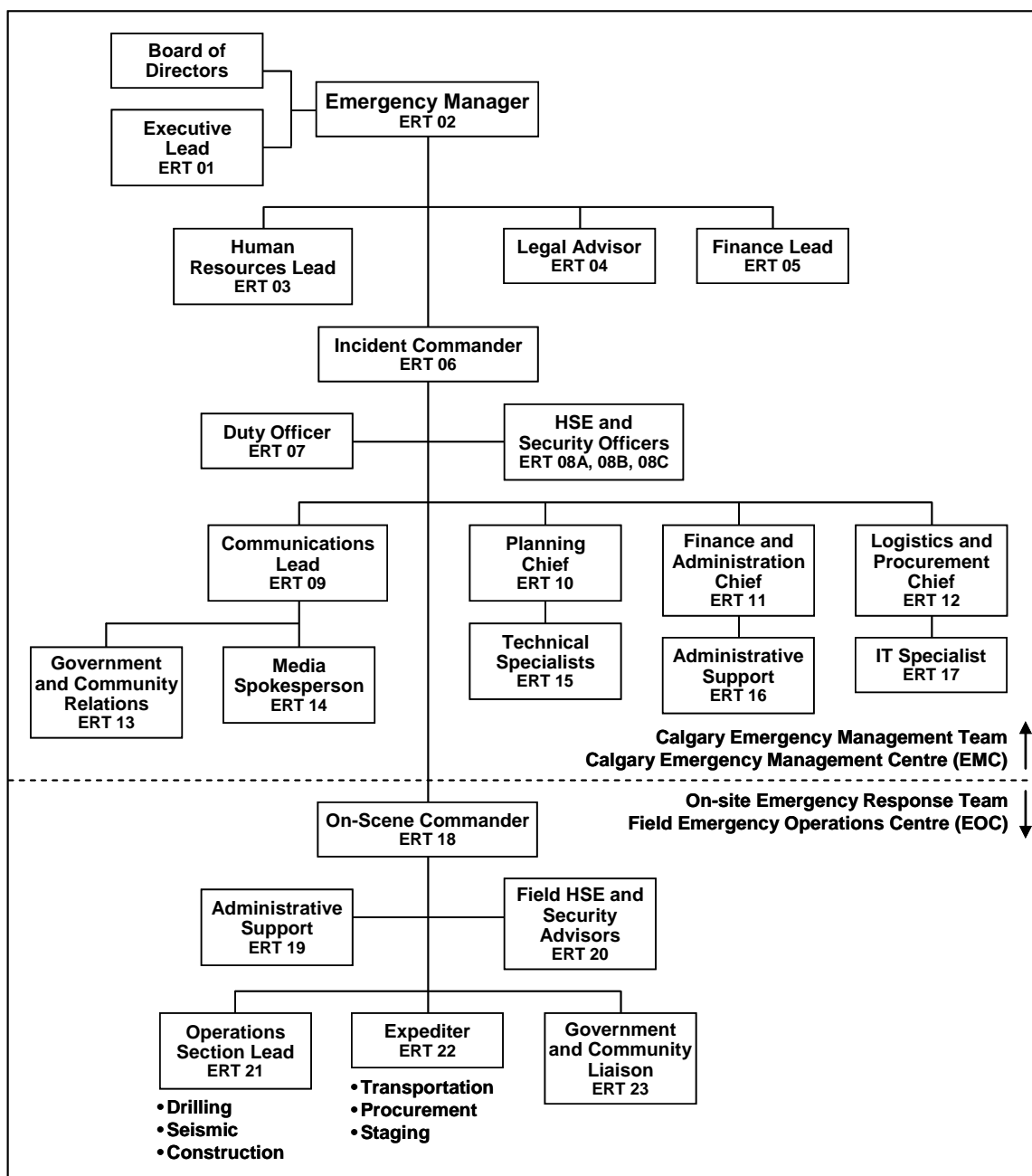


Figure 3-1: Emergency Response Team



Section 3.2 EMERGENCY RESPONSE ORGANIZATION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

CALGARY EMERGENCY MANAGEMENT TEAM

EXECUTIVE LEAD – ERT 01

Role

The executive lead is the senior management representative on the ERT.

Duties

The executive lead:

- decides the extent and method of senior management notification, as required
- notifies and provides briefings to the senior management team and board of directors
- addresses company policy issues, as needed
- approves major capital financial support, as required
- provides advice and support to the emergency manager
- participates in the initial risk assessment
- provides advice and support to the emergency manager
- provides overall policy direction and final decision authority, as required

Initial Action

As initial actions, the executive lead:

- goes to the Emergency Management Centre, as requested by the emergency manager
- participates in risk assessment and identification of potential consequences
- provides the emergency manager with immediate evaluation regarding:
 - risk and potential impacts to short and long-term exposures

Initial Action (cont'd)

- required corporate involvement and ERT functions, and resources needed
- recommended course of action

Support

To provide support in an emergency, the executive lead:

- provides briefings to the senior management and the board of directors, as required
- addresses the company policy issues, as needed
- approves major capital financial support, as required
- provides advice and support to the emergency manager
- ensures interfaces with external stakeholders are being managed effectively
- arranges for an executive lead backup, if required

Post Incident

The executive lead:

- gives the emergency manager approval to stand down the ERT once the status of corporate risks has been addressed and the go-forward issues, tasks and responsibilities have been clarified
- assists demobilization and post-incident activities, as determined by the ERT, as required

EMERGENCY MANAGER – ERT 02**Role**

The emergency manager possesses ultimate decision-making authority of the ERT, and:

- manages the corporate response and supports the ERT
- reviews all tactical decisions of other operating members of the ERT
- works in liaison with the executive lead
- provides advice and support to the CEMT
- assesses current and potential risks to the company
- coordinates the corporate staff and resources

Initial Action

As initial actions, the emergency manager:

- verifies the event and clarifies information
- makes contact with the executive lead
- identifies and mobilizes the support required, commensurate with the level of emergency
- verifies the event
- identifies corporate risks and potential consequences, and the company's position regarding liabilities. Consults with additional ERT members to assist in the assessment.
- goes to the Emergency Management Centre
- ensures switchboard personnel and appropriate building reception personnel are kept apprised of the situation, i.e., where to direct subsequent calls. This task might be undertaken by the communications lead.

Support

To provide support in an emergency, the emergency manager:

- holds an initial briefing with the ERT members
- solicits immediate evaluations from each of the ERT members regarding:
 - risk and potential impacts to the company's short and long term exposures

Support (cont'd)

- required corporate involvement and additional ERT functions and resources needed

- recommended course of action
- maintains ongoing communications with the ERT, and ensures support is provided
- establishes goals and objectives, and delegates responsibilities for task completions
- develops a 12-hour action plan, including provisions for relieving and rotating personnel. The period might be reduced, but not extended, depending on the scale of the incident.
- meets regularly with ERT members to clarify the incident status and continually addresses strategic issues
- determines, in conjunction with the executive lead, the representatives who are required to travel to the site or travel to government agencies
- arranges for an emergency manager backup, if required

Post Incident

The emergency manager:

- stands down the ERT, as directed by the executive lead
- directs demobilization and post-incident activities of the ERT
- ensures critical post-incident services are provided for employees, first responders, families, members of the public and next of kin

HUMAN RESOURCES LEAD – ERT 03**Role**

The human resources lead is responsible for personnel issues and their well-being. For incidents involving MGM Energy personnel or contractors, the human resources lead is responsible for:

- providing assistance in dealing with the family
- ensuring the family's material well-being
- managing critical incident stress debriefing (CISD) assessment and resources for all affected parties

Duties

This position will generally be filled by an on-call delegate from human resources, who:

- liaises with health providers, such as hospitals and doctors
- supports or provides Worker's Compensation Board (WCB) notification, as required
- coordinates human resources (HR) support, such as notifying the next of kin and arranging CISD sessions
- administers benefit programs, if serious injury or a fatality occurs

Initial Action

As initial actions, the human resources lead:

- receives a briefing from the emergency manager
- initiates any HR programs or support services required, i.e., travel services and benefits support

Support

To provide support in an emergency, the human resources lead:

- conducts ongoing liaison with medical personnel and hospitals, as required
- provides support and guidance to those responsible for next of kin notifications
- liaises with Calgary travel services regarding arrangements for support personnel travelling to the incident
- gives approval to mobilize trained CISD counsellors
- determines the nature of HR support requirements to respond to, including:
 - serious injury or fatality of company or contract personnel

- employee benefits and compensation
 - next of kin notification and support
 - arrangements for travel and accommodations, ground transportation, expenses and counselling for families
 - provisions for involved but uninjured personnel (responders) and contacting their families
- arranges for a human resources lead backup, if required

Post Incident

The human resources lead assists with the demobilization and post-incident activities, as determined by the ERT and as required.

LEGAL ADVISOR – ERT 04**Role**

The legal advisor is responsible for protecting the company's interests by mitigating potential legal issues or defending the company in an action. The legal advisor is responsible for keeping a chronological record of the ERT's actions, and:

- coordinates legal support and provides counsel concerning the incident
- supports the communications lead in addressing legal issues inherent in external communications

Initial Action

As initial actions, the legal advisor:

- goes to the Emergency Management Centre, as directed by the emergency manager or the incident commander
- receives a briefing from the emergency manager

Support

To provide support in an emergency, the legal advisor:

- evaluates the situation and, in consultation with the emergency manager, determines the legal concerns and general counsel support requirements
- determines the facts, status, risks and potential impacts, such as:
 - incident time and location – such as the company worksite, jurisdiction, land use and environmental sensitivities
 - incident details – prime contractor, who was directing work, substance released and details on the cause
 - incident response – who is in charge, who is directing work, regulatory notification, response strategy and controversy internally or from external sources
 - incident investigation – investigation process, determination if the process is privileged, government investigation, who had control of pollutant before discharge, who owns the pollutant, determination if charges have been laid or are contemplated, and liability determination
- determines legal reporting requirements
- determines what contractual arrangements are in place, i.e., lease of land, products and sales agreements, mutual aid agreements, and transportation and charter party agreements
- determines if additional contracts are required

- protects the company from unnecessary admissions, i.e., liability, and prepares disclosures against company interest by reviewing press releases and reports to employees, using solicitor-client privilege for investigations and legal advice
- attends press and media briefings
- arranges for a legal advisor backup, if required

Post Incident

The legal advisor assists with the demobilization and post-incident activities, as determined by the ERT and as required.

FINANCE LEAD – ERT 05**Role**

The finance lead is responsible for finance and other administrative issues. In the case of security-related incidents, the finance lead is responsible for liaison with banking institutions.

Duties

This position will generally be filled by a delegate from corporate finance, who coordinates and supervises the representatives of business functions, such as insurance, accounting and treasury.

Initial Action

As an initial action, the finance lead identifies, with the emergency manager, the current and potential financial and business support requirements.

Support

To provide support in an emergency, the finance lead:

- mobilizes, briefs and supervises additional business support staff, as required
- ensures the involvement of the finance and business section is adequate to support the response
- tracks the resources required and ordered
- clarifies and assigns tasks to support staff and ensures they provide:
 - an estimated time to complete the required task
 - where they need to be to complete the task
 - how often, and the method they intend to use, to notify the finance lead of progress and or obstacles
- ensures funding for incident response activities is in place and that complete accounting records are prepared and collected
- provides support and advice on insurance and accounting issues
- participates in planning meetings to ensure an understanding of overall strategy and to provide input on financial and cost analysis matters
- arranges for a finance lead backup, if required

Post Incident

The finance lead assists with the demobilization and post-incident activities, as determined by the ERT and as required.

INCIDENT COMMANDER – ERT 06**Role**

The incident commander is responsible for overall management of incident activities, including building a command structure that matches the organizational needs to achieve the determined tactical priorities to mitigate escalation of the incident and assist in recovery to normal operations. The incident commander has the responsibility to perform the duties associated with the command staff positions until the incident commander appoints someone to fill the positions.

Duties

The incident commander:

- obtains an initial situation briefing from the duty officer and appoints an operations section lead for ongoing communications with the on-scene commander, if not already acting in this capacity
- assesses the incident situation to define key issues and determines the appropriate level of response
- mobilizes the CEMT and develops the appropriate organizational structure based on the incident command system to effectively manage issues and resources, assign tasks and brief personnel
- activates the Calgary Emergency Management Centre
- implements the Emergency Response Plan
- notifies the Calgary emergency manager of an emergency
- serves as primary contact to the emergency manager and updates the status of the emergency on a regular basis throughout the incident
- determines strategic goals and tactical objectives for managing the incident
- develops and approves the Incident Action Plan with input from other personnel within the CEMT
- ensures that updates are provided to the CEMT
- sets a predetermined schedule to meet as a team for updates from all parties
- ensures that a time and event log (see Section 8, Forms) is completed for the duration of the event
- notifies relevant government agencies
- restricts the CEMT to five to seven individuals (maximum span of control). If the CEMT becomes too large, the incident commander reassigns officers to the planning section, such as to administrative support, HSE and security officers, and to the logistics section, such as security officer.

- coordinates CEMT activity
- prepares to act as initial information officer to release information to the media
- reviews the overall emergency operations on a continuous basis to identify further issues related to the emergency, and determines any additional resource or personnel required, approving requests for additional resources or release of resources
- approves the plan for demobilization
- ensures a post-incident meeting is conducted after the emergency is over to review emergency activities and identify any corrective action or follow-up that might be required

DUTY OFFICER – ERT 07**Role**

The duty officer, as the primary contact for the on-site personnel, contacts the incident commander to initiate the Emergency Response Plan.

Duties

The duty officer:

- records the details and the nature of the emergency, and completes an Initial Emergency Incident Fact Sheet, and if a spill or dangerous or hazardous release occurs, completes a Spill and Dangerous/Hazardous Goods Incident Report form (see Section 8, Forms)
- notes the phone number where the on-scene responders can be reached and arranges a specified time for the incident commander to communicate situation updates
- contacts the incident commander immediately to apprise the situation, and relays the details collected on the Initial Emergency Incident Fact Sheet, and, if required, The Spill and Dangerous/Hazardous Goods Incident Report

HSE AND SECURITY OFFICERS – ERT 08A, ERT 08B AND ERT 08C**Role**

The HSE and security officers, appointed by and reporting to the incident commander, are responsible for ensuring environmental issues resulting from the incident are identified and mitigated. Also, the HSE and security officers are responsible for ensuring emergency response activities are conducted in a manner that minimizes additional environmental impacts.

Personnel filling these positions should be environmental specialists familiar with emergency operations and environmental issues and impacts related to emergencies. Also, personnel should be familiar with company environmental procedures and appropriate environmental legislation.

Duties

HSE and security officers:

- obtain a briefing from incident commander about the incident and potential environmental concerns
- establish contact with government or other agencies with environmental jurisdiction, to identify concerns or issues related to the incident, where appropriate
- conduct an environmental incident assessment to identify potential environmental issues or concerns, through a review of site environmental sensitivity information, site reconnaissance and liaison with government officials, where appropriate
- identify short and long-term environmental issues, and recommend appropriate environmental procedures to the incident commander for minimizing or mitigating environmental impacts at the site
- coordinate environmental sampling, protection and clean up efforts, as required at the site
- advise personnel and contractors on environmental concerns or constraints related to site activities
- maintain a chronological log of incident activities and issues related to the environment
- coordinate post-emergency site assessment and development of a site-specific remediation plan

Tips

Tips for the HSE and security officers include:

- identify the lead environmental regulatory agency and department with which to communicate

- secure the services of an environmental laboratory for water, soil and air monitoring and analysis
- ensure that before and after photos are taken of any land for which issues might arise
- ensure that all claims for environmental damages are routed through the appropriate channels
- document all actions taken

COMMUNICATIONS LEAD – ERT 09**Role**

The communications lead provides advice on dealings with all internal or external communications, including media, investor, public and community, and employee communications. The communications lead might designate an alternate to be present at, or perform, any internal or external briefings. The communications lead will also be responsible for establishing and leading a public media inquiry room, as required.

Duties

This position will generally be filled by the VP legal and regulatory, who:

- reports to the incident commander and participates in the initial corporate risk assessment
- coordinates the strategic response actions to effectively manage media issues, general public inquiries and employee communications
- prepares to act as media spokesperson, until that position is assigned
- mobilizes and coordinates the activities of additional communications support staff, as required

Initial Action

As initial actions, the communications lead:

- identifies and provides support, as required by the emergency manager
- goes to the Emergency Operations Center, as directed by the incident commander
- participates in the corporate risk assessment and identifies potential consequences
- provides immediate evaluation regarding:
 - risk and potential impacts on MGM Energy, including short and long-term exposures
 - required corporate involvement and additional ERT resources needed
 - recommended course of action
- determines and clarifies the details of any media or public contact made to this point, and develops a communications plan for all stakeholders, including employees
- fulfills the role as initial media spokesperson and determines the role assignment, as required

Support

To provide support in an emergency, the communications lead:

- mobilizes additional communication functions, based on the incident and potential implications and as required, leading the media spokesperson, and liaises with the in-country incident commander on media and government relations matters
- ensures that Calgary staff and building reception personnel know where to direct subsequent calls regarding the incident
- decides whether a public media inquiry room is needed to process inbound calls. If, needed, the communications lead regularly confers with the public media inquiry room supervisor and clarifies the basic information that can be released, and where to transfer which type of calls
- continues to lead the communications section and supports the spokesperson role and the government and community relations role
- ensures that linkages between the Calgary-based media spokesperson and the field government and community liaison are maintained
- ensures clear lines of communications between groups, such as the media, public, community, government, employee and investor relations
- ensures that all releases are reviewed and approved by the legal advisor, incident commander and emergency manager
- participates in the status update briefings regarding completed tasks and issues, priorities, resource and staff requirements
- arranges for a communications lead backup, if required

Post Incident

The communications lead:

- prepares and sends out a closing briefing note regarding the incident
- assists with the demobilization and post-incident activities, as determined by the ERT and as required

PLANNING CHIEF – ERT 10**Role**

The planning chief, appointed by, and reporting to, the incident commander, is responsible for collecting, displaying and distributing information in support of emergency operations. The planning chief is also responsible for analyzing and evaluating information related to the incident, including the status of resources and planning for future events (the Incident Action Plan). The planning chief is also responsible for managing technical specialists.

Duties

The planning chief:

- obtains a situation briefing from the incident commander
- assesses the situation
- identifies the planning requirements and need for any specialty (on site) technical support
- analyzes the situation as it progresses by recording and evaluating information
- obtains specialized information, i.e., weather reports, in support of emergency operations
- establishes information requirements and reporting schedules for all ICS organizational elements for use in preparing the Incident Action Plan
- ensures that important information related to the incident is provided to the appropriate personnel within the emergency organization
- appoints appropriate staff, as necessary
- supervises planning sections and technical specialists, as required
- consults and collaborates with the operations section lead and logistics chief
- gathers and stores information related to the incident, such as photos, video and documentation, and ensures a log of emergency activities is kept
- maintains an inventory of on-site resources, as required, at the request of the incident commander
- meets with the incident commander and other key staff to update the incident status, and sets objectives and plans for future activities
- ensures that status updates from the incident site are put on display in the Calgary EMC
- supervises the preparation of the Incident Action Plan
- identifies the need for using specialized resources

- provides periodic predictions on incident potential
- ensures that normal agency information collection and reporting requirements are met
- maintains records of resources committed to the incident
- maintains and records activities

Tips

Tips for the planning chief include:

- obtain briefings from the incident commander
- use a white board, flip chart, overhead projector or LCD projector to communicate the action plan to the CEMT
- acquire maps, alignment sheets, photographic and video information, as needed
- look at the probable course of events based on the situation at hand and suggest alternative strategies, as required
- ensure that all forms are available and filled out, as required
- develop a required environmental assessment and obtain necessary permits
- profile and plan waste disposal with assistance from the HSE and security officers
- evaluate the status of the facility or equipment involved in the incident
- maintain a time and event log
- document all actions

FINANCE AND ADMINISTRATION CHIEF – ERT 11**Role**

The finance and administration chief, appointed by and reporting to the incident commander, is responsible for monitoring and tracking all costs and financial aspects of the incident, including:

- time records of personnel involved in the response
- equipment and rental supply contracts
- compensation claims and records
- cost information and cost estimates

Duties

The finance and administration chief:

- obtains a situation briefing from incident commander
- attends planning meetings to gather information
- identifies and orders supply and support needs for the finance section
- develops an operating plan for the finance function
- provides input in all planning sessions on financial and cost analysis matters
- participates in demobilization planning
- ensures that all obligation documents initiated are properly prepared and completed
- briefs personnel of all incident-related business management issues needing attention and follows up before the incident is de-classified
- maintains documentation

LOGISTICS AND PROCUREMENT CHIEF – ERT 12**Role**

The logistics and procurement chief, appointed by, and reporting to, the incident commander, is responsible for acquiring personnel, equipment, facilities, supplies and services to support emergency operations, and as requested by the incident commander.

Duties

The logistics and procurement chief:

- obtains a situation briefing from the incident commander, including any operational or logistical issues
- assesses the situation
- plans the organization of the logistics section, and appoints additional personnel, as required, to adequately manage logistical concerns or issues
- works closely with the incident commander to assess resources required, ordering and maintaining supplies or services in support of emergency operations
- coordinates activities with the staging officer on site, if a staging area is in place on site
- assigns work locations and preliminary tasks to personnel in the section
- participates in preparing the Incident Action Plan
- monitors site operations and meets with the incident commander or operations section lead to anticipate logistical needs to support present and planned incident operations
- ensures, at the request of the incident commander, the following:
 - to arrange accommodations and food for CEMT members and for site work crews
 - to arrange fuelling and equipment repair, and contract additional personnel or special resources
 - to maintain on-site communications systems and arrange for additional communications support
- reviews the Incident Action Plan and estimates the section needs for the operational period
- advises on current service and support capabilities
- maintains a record of resources received and controls the resource inventory, as appropriate

- prepares service and support elements of the Incident Action Plan
- reviews and releases unit resources to conform with the demobilization plan, when the planning section releases the demobilization plan
- ensures the general welfare of personnel involved in logistical activities

Tips

Tips for the logistics and procurement chief include:

- request additional support, depending on the size of the incident
- document all actions taken
- track the status of ordered resources and the estimated time of arrival on a Resource Summary form (see Section 8, Forms)
- keep the incident commander informed of any major logistical hurdles encountered
- ensure that accurate cost control measures are in place to avoid overruns

GOVERNMENT AND COMMUNITY RELATIONS – ERT 13**Role**

The government relations officer is appointed by, and reports to, the incident commander, and is responsible for notifying and communicating with government and regulatory agencies, as appropriate. This person might also act as a point of contact for assisting and cooperating agencies.

Personnel filling this position should be familiar with governmental departments and structure.

Duties

The government and community relations officer:

- obtains a status briefing from the incident commander
- identifies government and other agencies with jurisdiction related to the incident
- notifies and communicates the situation status to local government organizations
- liaises with local organizations, at an operational and technical level
- coordinates meetings between government agencies and company personnel, as required
- meets with the incident commander and other key staff to update the incident status, and sets objectives and plans for future activities

MEDIA SPOKESPERSON – ERT 14**Role**

The media spokesperson provides advice, through the communications lead, on dealings with the media. The media spokesperson might designate an alternate to brief the press in some instances, to prevent the accidental release of sensitive information to which the media spokesperson is privy.

This position will generally be filled by an investor relations person or a trained member of management team, who:

- manages media issues effectively
- liaises with the field-based government and community liaison spokesperson

Initial Action

As initial actions, the media spokesperson:

- obtains a status briefing from the communications lead
- determines and clarifies details of any media or public contact and assists the communications lead in implementing the communications plan

Support

To provide support in an emergency, the media spokesperson:

- confers with the communications lead regarding the need for additional communications staff, based on the incident and potential implications and as required
- maintains liaison with, and supports the field-based government and community liaison spokesperson
- determines what the media concerns are and what reports have been released to date
- ensures that all media releases are reviewed and approved through proper channels. (The communications lead will ensure that media releases are approved by the legal advisor, executive lead and the emergency manager, as appropriate.)
- ensures that the public media inquiry room supervisor understands how the media spokesperson wants media calls to be processed, documented or transferred, if the communications lead has activated the public media inquiry room
- communicates regularly with the communications lead to update basic incident information that can be released for:
 - general public enquiries received, corporately or at the field level

- media enquiries, in person or via telephone, corporately and at the field level
- investor relations
- employee relations
- determines, with the communications lead, if a senior company spokesperson is warranted, and if so, prepares the executive lead or other senior management staff to speak to the media or public
- arranges for a media spokesperson backup, if required

Post Incident

The media spokesperson:

- assists with the demobilization and post-incident activities, as determined by the ERT and as required
- refers to the post incident procedures, see Section 5, Response Procedures

TECHNICAL SPECIALISTS – ERT 15**Role**

Technical specialists are appointed by, and report to, the planning chief, as required to provide relevant support during the response to an incident. Depending on the needs of the response, the technical specialists might also be assigned to other sections in the CEMT.

Technical specialists are generally subject matter experts and might be resourced internally, or from external agencies or organizations.

ADMINISTRATIVE SUPPORT – ERT 16**Role**

The administrative support person, appointed by, and reporting to, the emergency manager, is responsible for keeping detailed logs of information in support of emergency operations.

Initial Action

As initial actions, the administrative support:

- ensures the availability of a note pad, flip charts and writing instruments
- ensures that phones are available and working in the Emergency Management Centre

Support

To provide support in an emergency, the administrative support:

- keeps a running list of high-level details on a flip chart or white board in the Emergency Management Centre
- locates critical phone numbers and places any calls required on behalf of, and at the request of, the emergency manager
- answers the phones for the ERT, if they are in critical meetings
- asks for clarification of such things as phone numbers and persons called
- ensures that all names are spelled correctly
- records only the information pertinent to the administrative support position
- ensures that all critical information from the EMT is documented for the ERT
- submits all forms and records to the emergency manager

Post Incident

The administrative support participates in the post-incident debriefing.

IT SPECIALIST – ERT 17

The information technology (IT) specialist:

- advises on technical support requirements, such as for the telecommunications networks (voice, data and fax)
- liaises with suppliers to implement network expansions, as required
- sources and supports procurement's efforts to locate and acquire special or incremental IT equipment, such as satellite phones and proprietary radio network equipment
- liaises with federal telecommunications regulators, if required



Section 3.3 EMERGENCY RESPONSE ORGANIZATION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

ON-SITE EMERGENCY RESPONSE TEAM

ON-SCENE COMMANDER – ERT 18

Role

The on-scene commander is usually the highest-ranking MGM Energy responder until relieved by more senior personnel on site. The individual in this position ensures that the Incident Action Plan is carried out and works with MGM Energy and contractor personnel on site to manage emergency response activities.

Duties

The on-scene commander:

- ensures that command is established on site
- protects life and property
- ensures that initial notification is made to the incident commander via the duty officer and declares an initial emergency level of 1, 2 or 3
- ensures that all on-site personnel are accounted for
- ensures that a command post is established in a safe area
- works closely with the contractor, where applicable, to monitor the contractor response and to provide support and resources to control the incident
- maintains close communication with the operations section lead, provides updates on the status of emergency operational activities, and works together with the operations section lead to define future operational objectives and activities
- conducts meetings with key on-site staff, including any other on-site MGM Energy senior personnel and key on-site contractor personnel, reviews the action plan and assesses on-site communications and safety
- determines the need for immediate and expected resources, and works with the operations section lead to request and mobilize necessary internal and external personnel and resources to undertake operational activities

Duties (cont'd)

- reviews operational activities on a continuous basis to determine that all equipment, supplies and materials are available to allow operational activities to be undertaken in a safe, efficient and effective manner, and determines the need for additional operational personnel or resources, as required
- communicates changes in operational conditions to the operations section lead
- maintains control of all on-site operations
- implements the Incident Action Plan
- maintains accountability for responder and public safety
- acts as the on-site MGM Energy liaison to outside agencies, where required

ADMINISTRATIVE SUPPORT – ERT 19**Role**

The administrative support, appointed by, and reporting to, the incident commander, is responsible for keeping detailed logs of information in support of emergency operations. The administrative support will normally be assigned to support the incident commander and the operations section lead.

Duties

The administrative support:

- ensures that all critical information is documented from both the incident commander and the operations section lead
- locates critical phone numbers and places any calls required on behalf of, and at the request of, the incident commander or operations section lead
- answers the phones for the incident commander or operations section lead, if they are in critical meetings
- submits all forms and records to the incident commander
- participates in the post-incident debriefing

Tips

Tips for the administrative support include:

- ensure the availability of a note pad, flip charts and writing instruments
- ensure that phones are available and working in the ICC
- ask for clarification of such things as phone numbers and persons called
- ensure that all names are spelled correctly
- record only the information pertinent to the administrative support position
- keep a running list of high-level details on a flip chart or white board in the ICC

FIELD HSE AND SECURITY ADVISORS – ERT 20**Role**

The field HSE and security advisors are responsible for supporting the on-scene commander and the OERT on all HSE issues and providing accurate analyses of environmental, health and safety issues.

These positions are filled by the on-site HSE field advisors, who:

- report to the emergency manager
- coordinate and supervise representatives of HSE

Initial Action

As initial actions, the field HSE and security advisors:

- identify, along with the on-scene commander, a course of action and develop an HSE plan for addressing the incident
- assist in displaying and tracking incident information and support the risk and priority-setting process
- implement the Spill Response Plan, if applicable to the emergency

Support

To provide support in an emergency, the field and HSE security advisors:

- mobilize additional HSE support personnel, based on the incident and potential implications, and as required
- provide information regarding safety and environmental conditions related to the incident, as requested by the on-scene commander
- participate in the status update meetings regarding:
 - current status
 - completed tasks and issues
 - go forward priorities and additional staff requirements
- assist, participate and, as required, facilitate ongoing regular risk assessments
- arrange for HSE and security advisor backups, if required

Post Incident

The field and HSE security advisors assist with the demobilization and post-incident activities, as determined by the ERT and as required.

OPERATIONS SECTION LEAD – ERT 21**Role**

The operations section lead appointed by, and reporting to, the on-scene commander, is responsible for direct management of all incident tactical activities and priorities, and the safety and welfare of personnel in the operations section. The operations section lead directs all resources to accomplish the goals and objectives developed by the ERT, and ensures that resources at the scene perform the tactical priorities to mitigate escalation and recovery from the incident.

The operations section lead is responsible for ensuring all operational activities are carried out consistent with company policy and government regulations, taking into account the concerns of all affected agencies or individuals.

Personnel filling this position must be familiar with company operational and safety procedures.

Duties

The operations section lead:

- obtains an initial situation briefing from the on-scene commander
- consults and collaborates with the on-scene commander to assess the situation
- works in conjunction with the on-scene commander to provide updates and information to the incident commander
- assists the on-scene commander in developing strategic goals and tactical objectives for the incident response
- consults with the incident commander about the overall Incident Action Plan
- develops the tactical operations portion of the Incident Action Plan
- consults and collaborates with the logistics and planning chiefs
- keeps the incident commander informed of any special conditions, activities and resource status within response operations
- assembles and disassembles tactical response teams, as necessary
- requests periodic progress reports from the on-scene commander
- recommends demobilization of resources
- maintains record of activities

EXPEDITER – ERT 22**Role**

The expediter is a key position for MGM Energy's remote operations. The expediter works with the field-based OERT and is responsible for arranging procurement and transportation services to facilitate mitigating any emergency incident.

Duties

The expediter:

- obtains an initial situation briefing from the on-scene commander or incident commander, depending on the location of the expediter
- consults and collaborates with the on-scene commander to assess the situation
- works in conjunction with the on-scene commander and the operations section lead to ensure that goods, materials, equipment and personnel are available and in the right place to support the incident response
- assists the on-scene commander to coordinate flights and logistics for response support
- works in cooperation with the logistics and procurement chief to ensure delivery of required resources, supplies and services in support of emergency operations
- ensures, at the request of the on-scene commander, the following:
 - to arrange accommodations and food for OERT members and for site work crews
 - to arrange fuelling and equipment repairs
 - to maintain on-site communications systems and arrange for additional communications support

GOVERNMENT AND COMMUNITY LIAISON – ERT 23**Role**

The government and community liaison officer reports to the on-scene commander and is responsible for notifying and communicating with government and local communities and stakeholders, as appropriate, and at the direction of the communications lead and their command staff in the Emergency Management Centre.

Personnel filling this position should be familiar with governmental departments and local communities.

Duties

The government and community relations officer:

- obtains an initial situation briefing from the on-scene commander, or communications lead, depending on the location of the government and community liaison person
- identifies local communities and organizations that might be affected by the incident
- communicates the situation status to local government organizations and communities, under the direction of the communications lead
- liaises with local organizations, at an operational and technical level
- coordinates meetings between local communities, government agencies and company personnel, as required
- meets with the on-scene commander and other key staff to update the incident status, and sets objectives and plans for future activities
- completes and presents a preliminary media statement, if required (see Section 8, Forms)
- selects community representatives to participate in local media briefings

**EMERGENCY CONTACTS****MACKENZIE DELTA
EMERGENCY RESPONSE PLAN****MGM ENERGY EMERGENCY CONTACTS**

EMERGENCY RESPONSE TEAM**General Contact Information**

General contact information for MGM Energy Corp. is:

MGM Energy Corp.
4100, 350 – 7th Avenue S.W.
Calgary, Alberta
T2P 3N9
main phone (403) 781-7800
main fax (403) 781-7801
www.mgmenergy.com

Emergency Contact Information

All MGM Emergency Calls are to go to the main phone number:

1-403-781-7800 (24 hour Emergency Number)

During Drilling Operations MGM Energy's duty officers are the first point of contact on the CEMT . Refer to Table 4-1 for Duty Officer Contacts:

Table 4-1: MGM Energy's Duty Officers (During Drilling Operations)

Position and position number	Name	Phone Number office (o) cell (c)	E-Mail Address*
Duty officer (ERT 07)	Dick Heenan	(403) 781-7819 (o) (403) 818-4408 (c)	Dick.Heenan@mgmenergy.com
Alternate Duty officer (ERT 07)	Marshall Melnechuk	(403) 781-7823 (o) (780) 554-4270 (c)	Marshall.Melnechuk@mgmenergy.com

Table 4-2 lists MGM Energy's emergency response team (ERT) contacts.

EMERGENCY CONTACTS

MGM EMERGENCY RESPONSE TEAM

Table 4-2: MGM Energy's Emergency Response Team Contacts

Position and position number	Name	Phone Number office (o) cell (c)	E-mail Address*
Calgary Emergency Management Team			
Executive lead (ERT 01)	Henry Sykes	(403) 781-7808 (o) (403) 860-5015 (c)	Henry.Sykes@mgmenergy.com
Emergency manager (ERT 02)	Gary Bunio	(403) 781-7806 (o) (403) 703-4602 (c)	Gary.Bunio@mgmenergy.com
Alternate emergency manager (ERT 02)	John Hogg	(403) 781-7820 (o) (403) 819-6096 (c)	John.Hogg@mgmenergy.com
Human resources lead (ERT 03)	Henry Sykes	(403) 781-7808 (o) (403) 860-5015 (c)	Henry.Sykes@mgmenergy.com
Legal advisor (ERT 04)	Nancy Dilts	(403) 781-7807 (o) (403) 519-2856 (c)	Nancy.Dilts@mgmenergy.com
Finance lead (ERT 05)	Rick Miller	(403) 781-7809 (o) (403) 519-7217 (c)	Rick.Miller@mgmenergy.com
Incident commander (ERT 06)	Dick Heenan	(403) 781-7819 (o) (403) 818-4408 (c)	Dick.Heenan@mgmenergy.com
Alternate incident commander (ERT 06)	Rob Carss	(403) 781-7813 (o) (403) 617-2195 (c)	Robert.Carss@mgmenergy.com
Alternate incident commander (ERT 06)	Ron Feschuk	(403) 781-7812 (o) (403) 815-4112 (c)	Ron.Feschuk@mgmenergy.com
Duty officer (day) (ERT 07)	Dick Heenan	(403) 781-7819 (o) (403) 818-4408 (c)	Dick.Heenan@mgmenergy.com
Duty officer (night) (ERT 07)	Marshall Melnechuk	(403) 781-7823 (o) (780) 554-4270 (c)	Marshall.Melnechuk@mgmenergy.com
HSE and security officer (ERT 08A,B,C)	Rob Carss	(403) 781-7813 (o) (403) 617-2195 (c)	Robert.Carss@mgmenergy.com
Alternate HSE & security officer (ERT 08A,B,C)	Ed Kustan	(403) 781-7822 (o) (403) 616-7207 (c)	Ed.Kustan@mgmenergy.com
Alternate HSE & security officer (ERT 08A,B,C)	Don Casey	(403) 781-7810 (o) (403) 470-1129 (c)	Don.Casey@mgmenergy.com
Communications lead (ERT 09)	Nancy Dilts	(403) 781-7807 (o) (403) 519-2856 (c)	Nancy.Dilts@mgmenergy.com
Planning chief (ERT 10)	John Ferris	(403) 781-7816 (o) (403) 620-5014 (c)	John.Ferris@mgmenergy.com
Finance and administration chief (ERT 11)	John Ferris	(403) 781-7816 (o) (403) 620-5014 (c)	John.Ferris@mgmenergy.com
Logistics and procurement chief (ERT 12)	Alistair Sim	(403) 281-7855 (o) (403) 650-9266 (c)	frontierlogistics@shaw.ca

EMERGENCY CONTACTS

MGM EMERGENCY RESPONSE TEAM

Table 4-2: MGM Energy's Emergency Response Team Contacts (cont'd)

Position and position number	Name	Phone Number office (o) cell (c)	E-mail Address*
Calgary Emergency Management Team (cont'd)			
Alternate logistics and procurement chief (ERT 12)	Dan Fensky	(403) 781-7815 (o) (403) 613-3641 (c)	Dan.Fensky@mgmenergy.com
Government and community relations (ERT 13)	Glenn Miller	(403) 781-7823 (o) (403) 554-4270 (c)	Glenn.miller@mgmenergy.com
Media spokesperson (ERT 14)	Nancy Dilts	(403) 781-7807 (o) (403) 519-2856 (c)	Nancy.Dilts@mgmenergy.com
Technical specialist – drilling (ERT 15)	Brad Scott	(403) 781-7826 (o) (403) 519-2856 (c)	Brad.Scott@mgmenergy.com
Technical Specialist – seismic (ERT 15)	Stewart Gall	(403) 366-2156 (o) (403) 540-4549 (c)	sgall@aguila.ca
Technical specialist – construction (ERT 15)	Jerry Bulman	(403) 269-3501 (o) (403) 831-7287 (c)	jerry@parkvalley.net
Administrative support (ERT 16)	Kristen Verberne	(403) 781-7826 (o) (403) 923-2310 (c)	Kristen.Verberne@mgmenergy.com
IT specialist (ERT 17)	Brian Cameron	(403) 969-2001 (c)	bc911@telus.net
On-site Emergency Response Team			
On-scene commander – construction (ERT 18)	Ron Krinke	(780) 985-2262 (c) (867) 678-8000 (o)	ron@parkvalley.net
	Kris Kobbero	(867) 678-8000 (o) (403) 322-2223 (c)	kris@parkvalley.net
On-scene commander – drilling (ERT 18)	John Williams	(867) 678-8010 (o) (780) 717-7252 (c)	john.williams@telus.net
	Fred Svenko	(867) 678-8010 (o) (250) 469-2260 (c)	Fredse@shaw.ca
On-scene commander – seismic (ERT 18)	Aguila Field Manager	(403) xxx-xxxx (c)	
On-scene commander – completions and testing (ERT 18)	TBD	(403) xxx-xxxx (o) (403) xxx-xxxx (c)	
Administrative support (ERT 19)	TBD	(403) xxx-xxxx (o) (403) xxx-xxxx (c)	

EMERGENCY CONTACTS

MGM EMERGENCY RESPONSE TEAM

Table 4-2: MGM Energy's Emergency Response Team Contacts (cont'd)

Position and position number	Name	Phone Number office (o) cell (c)	E-mail Address*
On-site Emergency Response Team (cont'd)			
Field HSE & security advisors – construction (ERT 20)	Monte DeMarco Darren Reilly	(867) 678-8001 (o) (403) 226-2905 (c) (867) 678-8001 (o) (780) 312-5700 (c)	hseconstruction@mgmenergy.com
Field HSE & security advisors –drilling (ERT 20)	Todd Resvick Barry Behan	(867) 678-8012 (o) (403) 399-0274 (c) (867) 678-8012 (o) (403) 370-5015 (c)	hsedrilling@mgmenergy.com
Field HSE & security advisors – testing (ERT 20)	Monte DeMarco Darren Reilly	(867) 678-8021 (o) (403) 226-2905 (c) (867) 678-8021 (o) (780) 312-5700 (c)	hsetesting@mgmenergy.com
Field HSE & security advisors – seismic (ERT 20)	TBD	(403) xxx-xxxx (o) (403) xxx-xxxx (c)	hseseismic@mgmenergy.com
Operations section lead – drilling (ERT 21)	Akita Rig Manager	(867) 678-8011 (o)	
Operations section lead – seismic (ERT 21)	Blaine Gervais	(403) 807-1935 (c)	
Operations section lead – construction (ERT 21)	Ron Krinke	(780) 985-2262 (c) (867) 678-8000 (o)	ron@parkvalley.net
Expediter -Inuvik (ERT 22)	Wayne Ross	(867) 777-3493 (o) (403) 818-5015 (c)	
Government and Community Liaison (ERT 23)	Wayne Ross	(867) 777-3493 (o) (403) 818-5015 (c)	
Note *: Primary means of emergency notification and contact is by phone. Use e-mail for follow-up reporting or where allowed by the emergency response procedures. TBD = to be determined when project staff are identified			

**EMERGENCY CONTACTS****MACKENZIE DELTA
EMERGENCY RESPONSE PLAN****EXTERNAL RESPONSE RESOURCE CONTACTS**

PUBLIC EMERGENCY SERVICES CONTACTS

Table 4-3 lists the contacts for public emergency services.

Table 4-3: Public Emergency Services Contact List

Position	Phone Number (Office)
Ambulance, Inuvik	(867) 777-4444
• Hospital Emergency	(867) 777-8161
• Hospital Main	(867) 777-2955
• Hospital Switchboard	(867) 777-8000
• Hospital Fax	(867) 777-8062
Fire, Inuvik	(867) 777-2222
Fire, Tuktoyaktuk	(867) 977-2222
NWT Forest Fire	(867) 777-3333
NWT Spill Response	(867) 920-8130
RCMP, Inuvik	(867) 777-1111
RCMP, Tuktoyaktuk	(867) 977-1111

EMERGENCY CONTRACTOR AND SUPPLIER SERVICES

Table 4-4 lists the emergency contacts for contractors' and suppliers' services. For heavy equipment contractor services, see Table 4-5.

Contact information for contractors identified from the Inuvialuit Business List, February 2007 may be subject to change. Contact the Inuvialuit Regional Corporation at (867) 777-2737 for updates.

Table 4-4: Response Resources and Contractor Contact List

Resource or Contractor	Phone Number (Office)
Camp Services (AOGS – Cliff MacDonald)	(867) 678-8007
Fuel Supply (Arctic Dove)	
Rig contractors Akita Drilling Ltd. (Dave Millar)	(867) 777-4903 (780) 717-0925
Seismic contractor Aguila (Stewart Gall)	(403) 366-2156
Spill Response Co-op	(867) 920-8130
Aviation Contractors	
Aklak Air (Fixed-wing medivac) Ken Dalton	(867) 777-3555
Bar XH Air	(403) 291-3227
Canadian Helicopters	(867) 777-2424
Highland North Helicopters	(867) 777-5151
North Caribou Air	(867) 777-4700 or (403) 717-1800
Sunwest Home Aviation	(403) 275-8121

Table 4-5: Heavy Equipment Contractor Contact Lists

Title	Name	Phone Number (Office)
Inuvik Contractors		
Allen Services	Brian McCarthy	(867) 777-4000
Arctic Star Contracting Ltd.	Frank Carmichael	(867) 777-2404
Beaufort Logistics	Kurt Wainmand	(867) 777-2426
Bob's Welding	Bob Guly	(867) 777-4174
David Storr & Sons Contracting Ltd.	Glenna Hansen	(867) 777-2673
Dowland Contracting Ltd.	Guy Pemberton	(867) 777-8500
Integrated Transportation Services Co-operation	Rob Adams	(780) 930-1453
Kila Enterprises	Johnny Lennie	(867) 678-2611
Lakes & Rivers Consulting	Moe Hansen	(867) 777-4037
Northern Oilfield Services	Rob Adams	(780) 232-6962
Northwind Industries Ltd.	Kurt Wainmand	(867) 777-2426

Table 4-5: Heavy Equipment Contractor Contact Lists (cont'd)

Title	Name	Phone Number (Office)
Inuvik Contractors (cont'd)		
Okeevik Energy Solutions LP	Bill Stamps	(867) 777-2673
Price Contracting Limited	Douglas Price	(867) 777-3015
Wolverine Rentals & Services Ltd.	Olaf Falsnes	(867) 777-3535
Tuktoyaktuk Contractors		
Heavy Equipment Contractors		
E. Gruben's Transport	Russell Newmark	(867) 977-7000
J & L Transport	Peter Louie	(867) 977-2304
Mackenzie Delta Integrated Oilfield Services	Russell Newmark	(867) 977-7000
Aklavik Contractors		
K & D Contracting	Dave McLeod	(867) 978-2792

EMERGENCY CONTACTS

EXTERNAL RESPONSE RESOURCE CONTACTS

**EMERGENCY CONTACTS****MACKENZIE DELTA
EMERGENCY RESPONSE PLAN****REGULATORY CONTACTS**

REGULATORY AGENCIES

Table 4-6 lists the regulatory agencies to be contacted in an emergency.

Table 4-6: Regulatory Agency Emergency Contact List

Agency and Person	Phone Number (Office)
NEB 24-hour emergency cellular	(403) 807-9473
GNWT, Energy and Natural Resources	(867) 777-7310
Civil Aviation Contingency Operations Division of Transport Canada	(613) 947-5140 *
Indian & Northern Affairs Canada	(867) 777-3361
National Energy Board	(403) 292-4800
NWT EMO, 24 hours	(867) 873-7554
NWT Workers' Compensation Board (24 hours)	(800) 661-0792
Operations Specialist, Safety and Conservation Officer – Rick Turner	(867) 299-3868
Petroleum Engineering Specialist, Safety and Conservation Officer – Chris Knoechel	(403) 299-3866
Professional Leader, Engineering Chief Safety Officer – Allan Murray	(403) 299-3903
Transport Canada – Aviation, Mike Gurbeau, John Burndett	(780) 495-2505
Note: * Monday to Friday 0700-1600 hours	

EMERGENCY CONTACTS

REGULATORY CONTACTS



EMERGENCY CONTACTS

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

MEDIA RELATIONS

PRIMARY SPOKESPERSON

MGM Energy believes it is important to communicate with the media and the public in an emergency. All communications with the media and public must be timely, accurate, and consistent.

The on-scene commander will be the primary MGM Energy spokesperson in the field, unless otherwise designated.

MAJOR COMMUNICATION ACTIVITIES

The on-scene commander will be assisted by personnel in MGM Energy's Calgary office. In some cases, additional media relations personnel will be added to the field emergency response team.

These personnel will assist with:

- responding to the media and questions from the public
- monitoring media coverage
- coordinating responses with government agencies

Communications could involve:

- an explanation of the emergency and the extent of its actual or potential impacts
- an announcement of public safety or environmental protection measures being taken
- an explanation of the status of the response, and planned actions
- a response to public concerns that may be voiced
- statements of what is being done, or will be done to prevent similar emergencies in the future
- contact details for sources of additional information

EMERGENCY CONTACTS

MEDIA RELATIONS



Section 5.1 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

INTRODUCTION

OBJECTIVES

This section identifies the emergency-specific first response procedures that have been developed for MGM Energy's field programs in the Mackenzie Delta. The objectives of these emergency response procedures are to:

- ensure the safety of workers, injured parties, responders and the public
- control hazards
- take initial measures to protect people, the environment, equipment and facilities
- notify and mobilize emergency response personnel and resources reporting to external agencies
- formulate preliminary communications with others who may be potentially affected

SITUATION APPRAISAL AND STRATEGY DEVELOPMENT

Following these initial steps, emergency response team members will fully assess the situation, identify issues, prioritize the issues, set objectives and develop resource situation-specific response strategies. These strategies will be implemented and their effectiveness evaluated and modified, as necessary.

For prolonged and complex emergency responses, such as marine spills and well-control situations, a unified command may be established with government agencies.



Section 5.2 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

FATALITY OR SERIOUS INJURY

APPROACH TO RESPONSE

Workers and visitors will be advised through work-site orientations, and pre-job and tailgate meetings that, regardless of the severity, all injuries must be reported promptly to their supervisor or, in the absence of their supervisor and for visitors, the MGM Energy's on-site representative. Injuries will be treated by the on-site medical staff. If more comprehensive medical treatment is required, arrangements will be made for a medivac.

Anyone who is involved in, discovers, or witnesses an incident that results in an injury, must report it to their supervisor, the MGM Energy on-site representative or the on-site medic.

In a Level 2 or 3 emergency, MGM Energy's on-site representative will assume the role of on-scene commander.

FIRST RESPONSE PROCEDURE

If an injury or fatality occurs:

1. All other workers on the site stop work immediately.
2. Call for help, from co-workers, others nearby, your supervisor and medical staff.

If it is safe to do so:

3. Remove the injured person to a safe location for treatment.

If it is unsafe to approach or move the injured person:

4. Develop a safety plan in order to proceed with the rescue.
5. Secure the site, including any sources of stored energy, to prevent anyone else from being injured and to preserve any evidence.
6. Notify your supervisor, if you have not already done so.
7. Assist the on-site emergency medical staff, as directed by them or your supervisor.

FIRST RESPONSE PROCEDURE (cont'd)

If the on-site medical staff decide that a medivac is required and when MGM Energy's air operations staff arrange for the appropriate aircraft:

8. Make the landing area at the evacuation site, and the route to the evacuation site, safe for use.

If the incident involves a disabling injury or a fatality:

9. Maintain the security of the site to allow for an investigation and site inspection – ensure evidence is preserved.

As soon as possible:

10. Notify MGM Energy's internal emergency contacts.

If the person injured or killed is a contractor:

11. Notify the relevant contractor's management as soon as possible.

If the incident involves a fatality:

12. Request management representatives from the worker's company to manage the expeditious and sensitive contact of the next of kin.

If the next of kin of the deceased cannot be reached:

13. Contact the RCMP and request assistance in notifying the next of kin.

If the deceased is a contractor's employee:

14. Request MGM Energy's management's assistance in providing support to the contractor.

EXTERNAL NOTIFICATION AND REPORTS

For medical treatment, restricted work, lost time injuries or fatalities, MGM Energy's on-site representative will ensure that the following external notifications and reports are made to the:

- RCMP
- NEB
- GNWT Workers' Compensation Board



Section 5.3 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

LOSS OF WELL CONTROL

APPROACH TO RESPONSE

If well control is lost, the safety of the rig crew and site personnel is the highest priority. Mitigating environmental damage and preserving the equipment to the extent possible is of secondary importance.

The drilling supervisor will act as the on-scene commander during a loss of well control and is authorized to direct the ignition of the well, if that is considered to be the appropriate course of action.

Well-specific control procedures are included in the well design and drilling program. Rig operations personnel are trained and certified in the appropriate well control techniques. Routine and planned well-control exercises and equipment checks are executed and logged.

Sour gas is not expected to be encountered in the Mackenzie Delta wells. However, if sour gas is expected during the well design process, this ERP will be revised to include appropriate sour gas emergency response procedures.

FIRST RESPONSE PROCEDURE

As soon as a loss of well control is identified:

1. Stop work immediately.
2. Sound the alarm.
3. Evacuate all non-essential personnel to the predetermined muster station.
4. Secure the site to prevent anyone from entering it.
5. Initiate well control procedures.
6. Initiate internal and external notifications, based on the severity, or potential severity, of the situation.

EXTERNAL NOTIFICATION AND REPORTS

For loss of well control, MGM Energy's on-site representative will ensure that the following external notification and reports are made to the:

- National Energy Board
- Inuvialuit Regional Corporation
- GNWT Department of the Environment and Natural Resources



Section 5.4 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

FIRE OR EXPLOSION

APPROACH TO RESPONSE

During the response to a fire or explosion, the safety of personnel and responders is of primary importance. Personnel should immediately sound the alarm and initiate an evacuation. A fire response might be attempted by personnel trained in the use of fire extinguishers if they are confident that they can safely contain or extinguish the fire with the available equipment. No one must ever try to begin fire-fighting alone.

For level 2 and 3 fires or explosions, MGM Energy's on-site representative will assume the role of on-scene commander. A competent and trained person, such as a contractor's senior on-site representative who has had fire-fighting and fire-rescue training, or a trained professional or volunteer fire-fighter, may be delegated as the fire response leader.

FIRST RESPONSE PROCEDURE

As soon as fire breaks out or an explosion occurs:

1. Stop work immediately.
2. Sound the alarm.
3. Evacuate all non-essential personnel from the area involved, or from the potentially affected area, to the predetermined muster stations.
4. Provide emergency medical attention to anyone injured.
5. Secure the site to prevent anyone from entering it.
6. Ensure that evacuees are safe and secure.
7. Take a head count of the evacuees.
8. Reconcile the evacuees' head count with the site roster to identify potential missing individuals.

If anyone is missing:

9. Develop a safe search plan to locate the missing individuals.

FIRST RESPONSE PROCEDURE (cont'd)

If required:

10. Mobilize transportation for evacuees to alternative sites.
11. Remove or control sources of fuel to the fire.
12. Assess the severity and potential severity of the fire or explosion.
13. Call for assistance, as required.
14. Develop a fire response strategy and safety plan.

If appropriate:

15. Mobilize heavy construction equipment to drag or push burning structures away from the fire.
16. Initiate a fire response with fire extinguishers and water trucks.
17. Initiate internal and external notifications.
18. Notify the owner of the camp, rig or equipment involved in the fire or explosion.

EXTERNAL NOTIFICATION AND REPORTS

For fires and explosions, MGM Energy's on-site representative will ensure that the following external notification and reports are made to the:

- National Energy Board
- RCMP
- GNWT Environment and Natural Resources



Section 5.5 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SHALLOW GAS ENCOUNTER DURING DRILLING

APPROACH TO RESPONSE

In responding to a shallow gas encounter during drilling, the safety of the rig crew and site personnel is the highest priority. The main concern regarding a shallow gas encounter during drilling is the potential for the gas to ignite, resulting in injuries to personnel or damaged or lost equipment. MGM Energy's on-site representative, or designated alternate, will assume the role of on-scene commander for level 2 and 3 shallow gas encounters.

FIRST RESPONSE PROCEDURE

As soon as shallow gas is encountered:

1. Close the diverter immediately.
2. Activate the igniter at the flare tanks.
3. Activate the emergency shutdown of the drilling equipment.
4. Sound the alarm.
5. Evacuate all non-essential personnel from the area, moving upwind of the leak or to the designated muster position.
6. Provide emergency medical attention to anyone injured.
7. Secure the site to prevent anyone from entering it.
8. Ensure that evacuees are safe and secure.
9. Take a head count of the evacuees.
10. Reconcile the evacuees' head count with the site roster to identify potential missing individuals.

If anyone is missing:

11. Develop a safe search plan for the missing individuals.

FIRST RESPONSE PROCEDURE (cont'd)

If required:

12. Call the MGM Energy base to assist the evacuees or to provide fire-fighting resources.
13. Initiate internal and external notifications, as required.
14. Allow gas to vent.
15. Monitor the gas flow from a safe distance.

When all audible and visible signs indicate that the gas flow has subsided:

16. Assess the area using a portable lower explosive limit (LEL) detector to determine if the work environment is safe.

If the work environment is unsafe:

17. Withdraw to a safe location.
18. Allow more time for venting.

When it is safe to return to the rig:

19. Check the rig thoroughly to identify any damage.

If the rig is not damaged:

20. Restart the rig.
21. Monitor the rig closely during start-up to identify any damage or malfunction.

EXTERNAL NOTIFICATION AND REPORTS

For shallow gas encounters, MGM Energy's on-site representative will ensure that the following external notification and reports are made to the:

- National Energy Board
- GNWT Environment and Natural Resources

If methane gas was involved in the release, a Spill Report will be submitted to the GNWT.



Section 5.6 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SHALLOW GAS ENCOUNTER DURING SEISMIC

APPROACH TO RESPONSE

In responding to a shallow gas encounter during a seismic program, the safety of the seismic crew and site personnel is the highest priority.

SYMPTOMS OF GAS POCKET ENCOUNTER

A gas pocket has been hit when:

- the Myno pump operation becomes laboured as a result of back pressure from gas
- gas blows and vents around the rotating drill pipe
- bubbles rise out of the water surrounding the drill casing or within the drill casing
- the engine on the drill unit suddenly accelerates
- gas monitors and alarms are activated
- gas vents out of the top of the drill stem when pulling the stem out of the slot hole
- an unusual odour is smelled when drilling or pulling out of the shot hole

FIRST RESPONSE PROCEDURE

Hitting a Gas Pocket

If a gas pocket is hit:

1. Shut down immediately, using the positive air shutdown safety feature, or by using the electrical master switch.
2. Evacuate the area by moving at least 100 m upwind of the rig, taking a handheld radio with you.

FIRST RESPONSE PROCEDURE (cont'd)

When you are in a safe location:

3. Radio the drill push and report the incident.
4. Keep away from the incident area until the gas has vented to atmosphere.
Possible scenarios that might be encountered include:
 - a whooshing or whistling sound
 - burbling or bubbling water
 - water spraying up the drill rig mast or control bank if a lot of pressure is causing the gas to vent
 - ice rising up and buckling or heaving

Recovery Operation

After releasing a gas pocket:

1. Wait until everyone involved has discussed and agreed on how to go about the recovery process.
2. Ensure that no one tries to remove the drill from the venting shot hole location.

When ready to implement the recovery procedure:

3. Obtain a multi-gas detector or monitor.
4. Check the multi-gas detector to make sure that it has been calibrated properly and is serviceable.
5. Ensure that the operator is:
 - trained in the use of the detector
 - wearing a flotation vest
 - tethered to a safety line
6. Assign the operator to start sweeping the area with the multi-gas detector or monitor from a crosswind direction.

When the area has been swept for gas, and before re-entering the work area:

7. Verify that the environment around the work area is safe to approach.
8. Check the surrounding and immediate area of the incident for ice thickness and quality.

9. Ensure that there are no areas on the rig in which gas might be trapped, such as the water tank
10. Ensure that all moving parts, such as tracks, are able to move freely.
11. Restart the drill.
12. Remove any remaining drill stem or casing from the ground.
13. Move the drilling rig to a safe location, well away from the incident site.
14. Abandon the shot hole.
15. Ensure that:
 - the shot hole is logged
 - the hazard area is marked properly
 - the information is placed on the hazard list or map
 - the information is communicated to all affected personnel in a timely manner



Section 5.7 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

ICE BREAKTHROUGH

APPROACH TO RESPONSE

The safety of personnel while working on, or travelling over, ice roads and ice platforms is a priority. Detailed ice management procedures are in place and will be followed throughout construction, drilling, seismic and logistic activities. Ice crossings must not be performed before the ice has been checked for thickness and evaluated for safe load-carrying capacity.

If a vehicle breaks through the ice, MGM Energy's on-site representative will assume the on-scene commander's role and will designate someone who is skilled and trained in safe ice management techniques to lead the rescue and recovery operations.

FIRST RESPONSE PROCEDURE

As soon as someone observes that a vehicle has broken through the ice:

1. Report the ice breakthrough and location to the MGM Energy base of operations.
2. Broadcast a traffic or work-site advisory, stopping all potential traffic or work in the immediate area, on the communication system.
3. Secure the area to prevent further traffic from entering the area.

If it is safe to do so:

4. Rescue the operator.
5. Have the operator cared for by those on site.

If specialized resources are required to attempt a rescue:

6. Mobilize rescue resources, including emergency medical staff, ice profiling personnel and equipment.
7. Develop a safety plan for the rescue.
8. Rescue the operator as quickly as possible.

EXTERNAL NOTIFICATION AND REPORTS

For ice breakthroughs, MGM Energy's on-site representative will ensure that the following external notification and reports are made to the:

- RCMP
- GNWT Department of Transportation
- Indian and Northern Affairs Canada
- NEB - Rick Turner



Section 5.8 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

MISSING OR OVERDUE PERSONS

APPROACH TO RESPONSE

The safety of people travelling to and from MGM Energy's work sites in the Mackenzie Delta is a priority. If the journey management protocol in the safety plan identifies that a vehicle or aircraft is overdue, the MGM Energy's on-site representative will assume leadership for implementing the response procedure.

FIRST RESPONSE PROCEDURE

As soon as a vehicle or aircraft is identified as being overdue:

1. Try to make radio or cellular telephone contact with the vehicle or aircraft.
2. Determine the last known location and time of the vehicle or aircraft, by estimating its last known location, direction of travel and estimated speed, and considering potential turnoff points.
3. Put search vehicles or aircraft on standby.

If a vehicle is missing:

4. Broadcast a message to all project-related vehicles and equipment and request all units to report any sightings or potential sightings immediately.
5. Advise the RCMP of the situation and actions being taken.
6. Request information from anyone who might have seen the vehicle.
7. Dispatch search teams when and where deemed appropriate.

If an aircraft is missing:

8. Contact flight operations at the local airports.
9. Enlist the help of the air service operator or owner of the aircraft.
10. Support the civil air authorities as they execute their search and rescue procedures.

EXTERNAL NOTIFICATION AND REPORTS

For missing or overdue persons, MGM Energy's on-site representative will ensure that the following external notification and reports are made to the:

- RCMP
- Civil Aviation Contingency Operations Division of Transport Canada
- National Energy Board
- Indian and Northern Affairs Canada



Section 5.9 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

WILDLIFE ENCOUNTERS

APPROACH TO RESPONSE

Workers should not expose themselves to potential confrontations with naturally predatory animals. However, if such a situation occurs, the worker should try to withdraw to a safe place.

FIRST RESPONSE PROCEDURE

If the presence of wildlife, such as bears, wolves, or foxes, is identified near MGM Energy work sites or camps:

1. Report the presence or encounter to your supervisor immediately.
2. Mobilize on-site wildlife monitoring resources.
3. Alert other workers to the hazard and order them to stay in a safe location until the wildlife situation is resolved.
4. Assess the ongoing or potential risk to workers.
5. Notify the MGM Energy's on-site representative as soon as practical.
6. Report all encounters with wildlife internally and externally, as required.

EXTERNAL NOTIFICATION AND REPORTS

MGM Energy's on-site representative will ensure that all wildlife encounters are reported to the GNWT Environment and Natural Resources.



Section 5.10 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

VEHICLE ACCIDENTS

APPROACH TO RESPONSE

The safety of everyone using the roads is a priority for MGM Energy, its contractors and subcontractors. If a vehicle accident occurs, providing emergency care for any injured parties is of paramount importance. MGM Energy's on-site representative will take the lead role in responding to, or organizing the response to, a vehicle accident.

FIRST RESPONSE PROCEDURE

If you are involved in, or observe, a vehicle accident:

1. Report the accident to MGM Energy's on-site representative, or your supervisor, immediately.
2. Determine if anyone has been injured.

If so:

3. Render emergency care to the injured until emergency medical staff arrive.
4. Secure the area to prevent any further accidents.
5. Mobilize rescue resources.
6. Initiate internal and external notifications.

If requested by your supervisor, other company representative or the RCMP:

7. Preserve the scene of the accident for investigation, as required.

EXTERNAL NOTIFICATION AND REPORTS

For vehicle accidents, MGM Energy's on-site representative or designate will ensure that the following external notification and reports are made to the:

- NEB
- RCMP
- Department of Transportation



Section 5.11 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

AIRCRAFT EMERGENCY LANDING

APPROACH TO RESPONSE

Response to in-flight emergencies is the responsibility of the air crew. If an in-flight emergency results in an emergency landing at an airstrip or at some other location, MGM Energy will actively support regulatory agencies, the aircraft operator, and public responders in executing the appropriate response to the extent possible. MGM Energy's on-site representative will be the key liaison with the response teams unless an alternate is assigned.

FIRST RESPONSE PROCEDURE

If the emergency landing of an aircraft is identified:

1. Confirm that the civil air operations and aircraft operator have been notified.
2. Determine what response, if any, has been initiated.
3. Determine what support MGM Energy's on-site staff and contractors can provide.
4. Initiate internal notifications.
5. Monitor the progress of the situation.
6. Notify on-site workers to stand by.
7. Provide assistance, as required.
8. Monitor ongoing work-site activities and determine if a work stand-down is necessary for the safety of ongoing operations.

EXTERNAL NOTIFICATION AND REPORTS

MGM Energy's on-site representative will confirm with the aircraft operator that the required external notifications and reports have been made to the:

- RCMP
- Department of Transportation
- NEB



Section 5.12 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

MARINE VESSEL INCIDENTS

APPROACH TO RESPONSE

The crew and operator of a chartered marine vessel are responsible for responding to marine emergencies. If a marine emergency results in a vessel capsizing or sinking, MGM Energy will actively support regulatory agencies, the vessel operator, and public responders in executing the appropriate response, to the extent possible. MGM Energy's on-site representative will be the key liaison with the response teams unless an alternate is assigned.

FIRST RESPONSE PROCEDURE

If you observe, or are notified of, a marine vessel capsizing or sinking:

1. Confirm that the Canadian Coast Guard and vessel operator have been notified.
2. Determine what response, if any, has been initiated.
3. Determine what support on-site MGM Energy staff and contractors can provide.
4. Initiate internal notifications.
5. Monitor the progress of the situation.
6. Notify on-site workers to stand by.
7. Provide assistance, as required.
8. Monitor ongoing work-site activities and determine if a work stand-down is necessary for the safety of ongoing operations.

EXTERNAL NOTIFICATION AND REPORTS

For marine vessel incidents, MGM Energy's on-site representative, with the marine vessel operator, will ensure that the following external notification and reports are made to the:

- RCMP
- Department of Transportation



Section 5.13 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

WORK-SITE SECURITY BREACHES OR CRIME

APPROACH TO RESPONSE

Security issues or worksite criminal behaviour includes:

- vandalism
- theft of equipment, tools or materials
- possession or sale of contraband
- verbal or physical threats
- fights and other physical confrontations
- acts of harassment

The safety of project workers, equipment and facilities is of primary importance to MGM Energy. Depending on the severity of the issue, the situation might be handled by the on-site project manager. The situation and response will be logged for trend analysis and reported to MGM Energy management, according to reporting guidelines. If the issue is severe enough, the RCMP's assistance will be requested. MGM Energy's on-site representative will liaise with the RCMP in implementing the response.

FIRST RESPONSE PROCEDURE

When a security breach or crime is detected:

1. Ensure the safety of those directly or indirectly involved.
2. Determine the severity or potential severity of the issue.
3. Initiate appropriate external and internal notifications.
4. Secure the site or equipment for investigative purposes, if required.
5. Support any police intervention or response.

EXTERNAL NOTIFICATION AND REPORTS

For security violations and criminal behaviour incidents, MGM Energy's on-site representative will ensure that the RCMP is notified and that the required reports are made.



Section 5.14 EMERGENCY RESPONSE PROCEDURES

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SEVERE WEATHER

APPROACH TO RESPONSE

Operations in the Mackenzie Delta and Northwest Territories are subject to occasional extreme weather conditions. In these conditions, the safety of the project workforce and the integrity of the operations and equipment are the primary concerns.

FIRST RESPONSE PROCEDURE

If extreme weather is forecast:

1. Assessing the situation, considering the weather forecast.
2. Conduct a head count of all personnel.
3. Determine the safety status of all personnel.
4. Taking safe mitigative action, depending on the situation.
5. Develop and implement plans, ensuring the safety of responders.
6. Monitor the weather forecasts continually, and adjust plans accordingly.
7. Initiate internal notifications and communications, as required.
8. Determine and implement external notifications or advisories, if appropriate.

EXTERNAL NOTIFICATION AND REPORTS

MGM Energy's on-site representative will ensure that the appropriate internal reports are completed for severe weather incidents.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SPILL PREVENTION PRINCIPLES

OBJECTIVE

MGM Energy will manage its operations to the extent possible to prevent any oil, liquid hydrocarbons or other potentially hazardous materials from being spilled. To meet this objective, MGM Energy will assess the risk of spills and will implement appropriate measures to reduce the risk of spills in every aspect of its operations.

RISK ASSESSMENT

The risk assessment for spills will focus primarily on:

- pre-job planning
- primary containment
- secondary containment

Pre-Job Planning

The first step in spill prevention is to assess the work site and the jobs to be performed at the site. Items to be considered when planning the work site include:

- ensuring that the lease and fuel storage pad is surrounded by a berm, or that tanks are double walled. Lease construction standards include providing an ice or snow berm on the perimeter of the lease to:
 - provide temporary containment
 - make cleanup more efficient
- locating fuel storage areas at least 100 m from the high-water line or any waterbodies
- ensuring that an ice pad is in place. Drilling leases require an underlying ice pad to:
 - provide temporary containment
 - prevent spilled material from penetrating underlying soil and vegetation
 - facilitate cleanup and removal of contaminants

Pre-Job Planning (cont'd)

- minimizing the volume of liquid hydrocarbons and other waste materials that need to be stored and used
- assessing the transportation and handling logistics of materials enroute to the work site
- ensuring that personnel handling materials have the appropriate personal protective equipment (PPE) and handling equipment to minimize the risk of spillage and to handle these materials safely. Vehicles or personnel handling hydrocarbons or hazardous material will be equipped with:
 - absorbent material
 - portable drip trays
 - plastic bags for isolating and transporting contaminated snow, ice or dirt
- ensuring that dedicated and trained refuelling personnel are in place, and that they understand refuelling procedures
- communicating the expectation of *zero discharge and leak tight* to personnel and contract employees as part of the work site and job orientation process

Improving worker awareness is a key component of any continuous improvement, improved reporting and prevention program. Expectations and key findings will be communicated to all operations personnel through orientation, safety meetings and pre-job meetings, to help MGM Energy reach and maintain a zero spills record.

Primary Containment

The integrity of all primary containment, i.e. tanks and associated equipment, will be maintained, by:

- inspecting tanks and associated equipment daily as part of the formal equipment check
- including the inspection results in the daily report

Ensuring that adequate lighting and access is available around this equipment will enhance spill detection and cleanup, thereby reducing the effects of any spills. Equipment, hoses and tanks will be inspected before any fluids are transferred to and from a storage facility. Planned inspections include:

- checking the general condition of the fuel and liquid storage tank, including:
 - inspecting the paint for blisters and the tank surface for corrosion. A thorough inspection of the inside, underside and outside of the tank provides a good assessment of the tank's condition. If the condition is poor, the tank will be flagged, then replaced.

- looking for large dents or other deformation
- determining whether the tank is well supported. For winter operations on frozen ground, the tank should be stable.
- determining whether the secondary containment, overfill protection and leak detection systems are in place and in good condition. Where required, the secondary containment system should be effective during spring and summer.
- ensuring that tank valves are installed and are in good working condition. The seals (stem and gate) must be leak tight. A drip tray must be installed under the valves to contain any minor leakage from the valve seals.
- checking that bull plugs or blind flanges are in place. When tanks are not being actively used, such as when a filling or discharge hose is not connected to the tank valves, but the tank is being used for storage, the outlets from the tank will be fitted with dual barriers. These barriers usually consist of a valve and a bull plug or blind flange.
- checking that transfer hoses connected to tanks are securely attached, tight and not leaking. Below any hose connections, a drip tray or barrel must be installed to collect minor leaks. If a tank is not to be used for an extended period, the hose should be removed and the bull plug installed. Hoses used to transfer hydrocarbons will be properly drained, then stored in a container that has primary containment.
- checking that vents and hatches are working properly. Ensuring that open venting exists is critical, especially for tanks containing volatile hydrocarbons.
- ensuring that tank gauges are working correctly. The tanks should have some method of overfill protection, to prevent them from being overfilled.

Secondary Containment

Secondary containment will be provided for all fluids contained on MGM Energy locations. The secondary containment system will consist of one of the following:

- integrated containment tanks, such as Enviro Tanks
- bermed ice-liner systems underneath single containment tanks

The berm liner system will be expected to contain 110% of the volume of the largest single tank installed in the berm area. This expectation is based on the premise that only one tank failure should occur before detection and cleanup has occurred.

The secondary containment area will be contoured to contain the spill and to allow access for spill cleanup.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SPILL RESPONSE AND NOTIFICATION

APPROACH TO RESPONSE

In all spill responses, the protection of workers, responders and the environment are the key priorities.

MGM Energy is a member of the Mackenzie Delta Spill Response Corporation (MDSRC), and will use the MDSRC equipment to respond to MGM Energy spills, where the volume or location of the spill requires specialized equipment. For a list of the MDSRC equipment available for use, see Appendix 1.

A Workplace Hazardous Materials Information System (WHMIS) binder, which provides information on the types of materials used at the work site, their hazards and safe handling methods, will be provided at each work site.

Figure 6-1 illustrates the major steps taken for Level 1, 2 and 3 spills. MGM Energy's on-site representative will assume the role of on-scene commander for Level 2 and 3 spills.

SAFETY HAZARDS

Pre-Response Precautions

Personnel who are responding to a spill can be exposed to various safety hazards. As with any emergency, workers should never expose themselves or their co-workers to increased danger. Before responding to a spill, workers should always protect human life first. The health and safety of workers and the public are the primary concern.

Safety hazards associated with a spill response depend on the components of the spilled material and the environment where the spill occurred. MSDS sheets will be available at the work site for all chemical products being used there. All workers will be trained in the MSDS system through WHMIS training. Where appropriate, before a response is initiated, MSDS sheets will be reviewed, so that responders fully understand the:

- potential hazards
- requirements for personal protective equipment
- treatment related to the spilled material

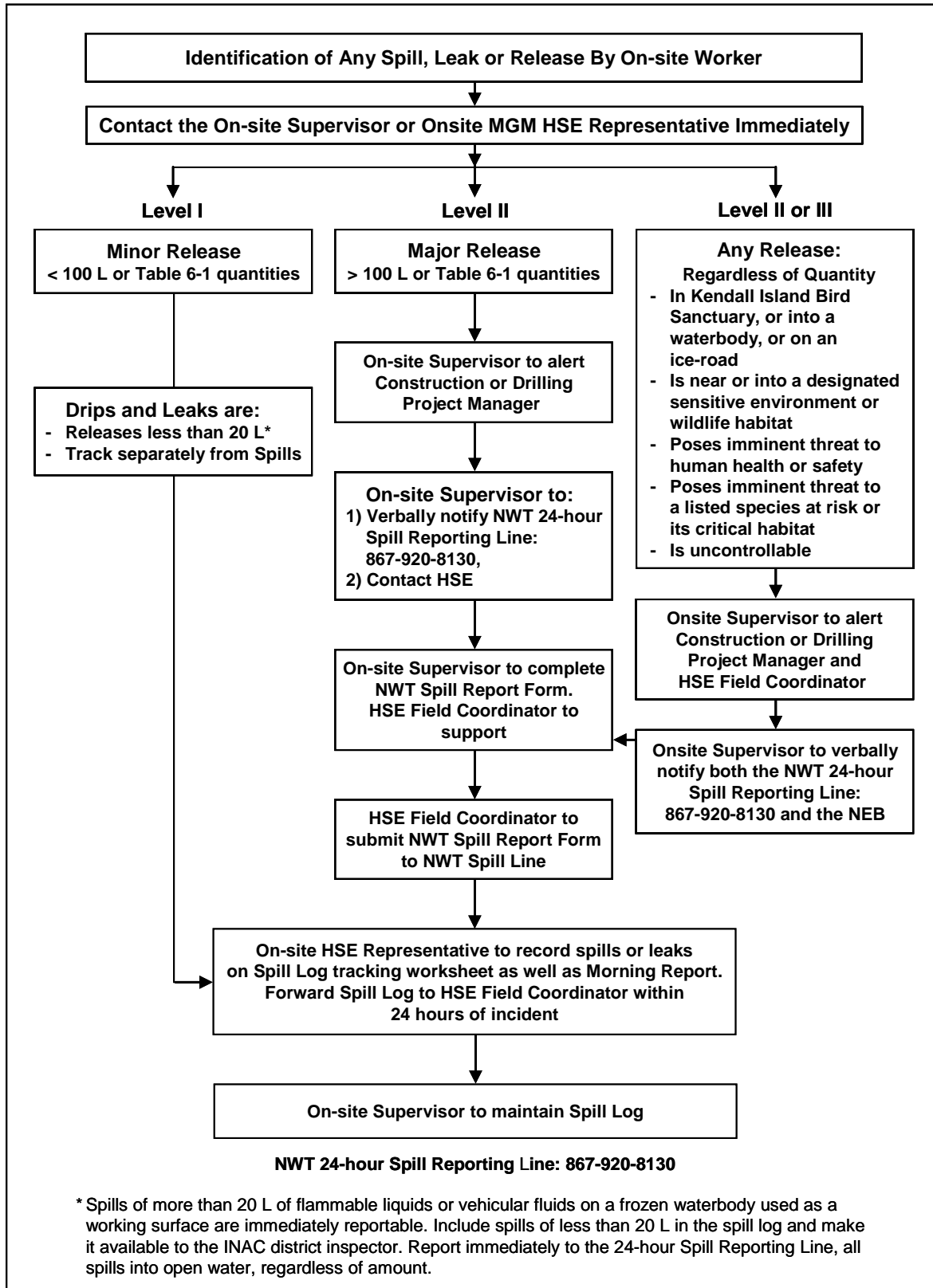


Figure 6-1: Spill Response and Notification Protocol

Common Safety Issues

Common safety issues that supervisors must be aware of when managing a spill response include:

- weather conditions – exposure to the elements, such as cold and wind
- flammability – the potential for gas vapours to ignite from a spill or other flammables on site
- toxicity – vapours, aromatics, skin irritation
- confined space issues – work plans will be designed to ensure that any confined spaces are identified and safety standby personnel are in place
- simultaneous work with heavy equipment – ensure good communication and good visibility, such as fluorescent striping on workers' clothing and adequate lighting

Appropriate personal protective equipment is required for all spill response personnel.

GENERAL SPILL RESPONSE PROCEDURE

As soon as a spill is identified:

1. Stop work immediately.
2. Sound the alarm.
3. Determine the type and quantity of material spilled (see Table 6-1, Immediately Reportable Spill Quantities and Table 6-2, Typical Drilling Products Usage).
4. Call for assistance. For hydrocarbon spills, this might include the Mackenzie Delta Spill Response Corp.
5. Evacuate all non-essential personnel from the immediate area.
6. Secure the site to prevent anyone from entering it.
7. Provide emergency medical attention to anyone injured.
8. Ensure that evacuees are safe and secure.
9. Take a head count of the evacuees.
10. Reconcile the evacuees' head count with the site roster to identify potential missing individuals.

If anyone is missing:

11. Develop a safe search plan for the missing individuals.

GENERAL SPILL RESPONSE PROCEDURE (cont'd)

If it is safe to do so:

12. Shut off the source of the spill.
13. Initiate internal and external notifications, including reporting the type and amount of material spilled to the on-scene commander.
14. Assess the situation, to determine:
 - potential containment and recovery plans
 - potential protection plans for adjacent and downstream areas

Table 6-1: Schedule 1: Immediately Reportable Spill Quantities

TDG Class	Substance	Immediately Reportable Quantities for NWT or Nunavut 24-Hour Spill Report
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive substances Unknown substance	Any amount
2.1 2.2	Compressed gas (flammable) Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
3.1 3.2 3.3	Flammable liquids	≥ 100 L
4.1 4.2 4.3	Flammable solids Spontaneously combustible solids Water reactant	≥ 25 kg
5.1 9.1	Oxidizing substances Miscellaneous products or substances, excluding PCB mixtures	≥ 50 L or 50 kg
5.2 9.2	Organic peroxides Environmentally hazardous	≥ 1 L or 1 kg
6.1 8 9.3	Poisonous substances Corrosive substances Dangerous wastes	≥ 5 L or 5 kg
9.1	PCB mixtures of 5 or more parts per million	≥ 0.5 L or 0.5 kg
None	Other contaminants, such as crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, sewage effluent and waste water	≥ 100 L or 100 kg
None	Sour natural gas, i.e., gas containing H ₂ S Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

Table 6-2: Typical Drilling Product Usage

Product	Unit Size	Units Used
Barite (bulk)	1 MT	100
Barite (M-I)	40 kg	7,200
Calcium carbonate 325	25 kg	150
Calcium carbonate 0	25 kg	150
Calcium carbonate (poultry)	25 kg	150
Calcium carbonate (supercal)	25 kg	150
Caustic soda	22.68 kg	76
Chemicide	20 L	24
Desco Cf	11.34 kg	24
Drilling detergent	18.93 L	10
Fed Pac (Reg)	22.68 kg	65
Fed Pac (UL)	22.68 kg	289
Fed Zan D	11.34 kg	360
Lime	20 kg	60
Potassium chloride	25 kg	6,005
Sapp	22.68 kg	34
Sida ash	22.68 kg	10
Sodium bicarbonate	22.68 kg	80
Sulfamic acid	25 kg	80
Ultracap	22.68 kg	197
Ultrafree	208 L	84
Ultrahib	208 L	134

NOTIFICATION AND REPORTS

Internal Reports

If a high-traffic work area starts to show signs of contamination as a result of frequent minor spills from equipment operating at a site, timely cleanup will be performed regularly to the satisfaction of MGM Energy's on-site representative. Preventive measures will include:

- removing leaky equipment from the site
- using drip trays
- using belly tarps
- maintaining an internal log of spills from each piece of equipment
- using the internal log to identify equipment needing repair

If MGM Energy's on-site representative determines that an area has become contaminated enough to potentially cause damage to the environment, the spill will be reported immediately to the 24-hour spill reporting line. The affected area will also be cleaned up immediately.

External Reports

For reportable spills MGM Energy's on-site representative will ensure that the following external notification and reports are made to the:

- National Energy Board, 24 Hour Cell number (403) 807-9473
- GNWT Environment and Natural Resources (ENR) 24-hour spill reporting line (867) 920-8130, fax (867) 873-6924

Immediately Reportable Spills

An immediately reportable spill is any release of a substance that:

- is likely to be an imminent hazard to human health or to the environment
- exceeds the volumes listed in Table 6-1

These spills must be reported, immediately after being discovered, to the NWT 24-hour spill reporting line.

In addition, all releases of harmful substances, regardless of quantity, are immediately reportable to the NWT spill line and National Energy Board, where the release:

- is near or in a waterbody
- is near or in a designated sensitive environment or sensitive wildlife habitat
- poses an imminent threat to human health or safety
- poses an imminent threat to a listed species at risk or its critical habitat
- is uncontrollable



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

GENERAL RESPONSE TO WINTER SPILLS

WINTER SPILL CHARACTERISTICS

Winter spills present a lower risk of environmental damage than spills during other seasons. Snow is an excellent absorbent and the frozen ground or ice acts to prevent the contaminants migrating into the soil or water. Ice and frozen ground also provide an effective surface on which heavy equipment can operate.

For spills that are not witnessed, staining on snow and ice is typically pronounced and a useful indicator of the extent of the spill. Odour can be used as another indicator of impact and extent.

APPROACH TO RESPONSE

MGM Energy will position MDSRC spill response containers at key locations in activity areas, such as camp sites, staging areas, drill sites and testing areas, to ensure that appropriate response equipment is available immediately, in case of a release.

RESPONSE PROCEDURE

1. Follow the first response procedure (see Section 6.2).

When the source of the spill has been controlled:

2. Build a berm to contain the flow of liquids, using shovels or front-end loaders, taking care not to damage the tundra.
3. Use absorbent materials to assist with containment.
4. Avoid having vehicle tires track contaminants away from the area.

For large spills:

5. Line the face of the berm with tarps to increase its effectiveness.
6. Recover liquids, using vacuum trucks, to the extent possible.
7. Use a dump truck and front-end loader to clean up the contaminated snow, taking care not to damage the tundra.

RESPONSE PROCEDURE (cont'd)

8. Use empty tanks for storing recovered materials.

For work close to the base of the snow:

9. Use hand shovels.

Using the totes, barrels, shovels and absorbent materials that will be available at all MGM Energy work sites:

10. Excavate contaminated snow to open 1 m³ lined totes or empty barrels.
11. Move contaminated snow in containers to the on-site evaporator.
12. Seal the residual material from the evaporator into drums for transportation to an approved industrial disposal site.

Before transporting affected material by truck:

13. Conduct a flash point test on the isolated material.
14. Review the test with GNWT Department of Transportation to determine if hazardous waste manifests are required.

If a manifest is required:

15. Obtain a manifest from the operator of record:
 - on free liquids
 - in locations that are hard to access
 - for materials that cannot be readily cleaned up with heavier equipment
16. Collect contaminated absorbent material at the site in appropriate containers.
17. Move the contaminated absorbent material under manifest to an approved industrial landfill that will accept the waste.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

EQUIPMENT BREAKING THROUGH ICE

RESPONSE PROCEDURE

If a vehicle or other equipment breaks through the ice:

1. Ensure that any personnel nearby are safe.
2. Organize the rescue of anyone involved in the vehicle or equipment that broke through the ice.

When anyone involved in the incident has been rescued, and as soon as it is safe to do so:

3. Conduct a risk assessment for removing as much fuel from the vehicle as possible, to limit the amount of fuel spilled during the recovery.
4. Recover the vehicle or equipment.

As soon as possible after the vehicle has been recovered:

5. Report any fuel spilled during vehicle recovery to the NWT 24-hour spill reporting line.
6. Use a vacuum truck to clean up the spill.
7. Mobilize spill response equipment, as necessary.
8. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
9. Report any releases to the NWT 24-hour spill reporting line.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SPILLS UNDER ICE

APPROACH TO RESPONSE

Spills under ice procedures are also described in the seismic contractor's and barging contractor's ERPs.

RESPONSE PROCEDURE

If a spill occurs under the ice:

1. Ensure that any personnel in the spill area are safe.
2. Organize the rescue of anyone involved in the vehicle or equipment that broke through the ice.

As soon as possible:

3. Mobilize spill response equipment, as necessary.
4. Position ice safety package and rescue crew.

Before deploying work crews:

5. Perform an ice safety assessment.
6. Ensure that the crew is safely belted with manned ropes.
7. Clear snow on an approved location.
8. Establish a controlled access point to the site.
9. Use a check-in and out procedure.
10. Locate a decontamination station, if required.
11. Perform a pre-deployment survey, including:
 - developing an action plan, including an auger survey grid and flag holes
 - determining if hydrocarbons are present and documenting the findings
 - determining slot and deflector wall locations
 - reviewing recommendations with the response team

RESPONSE PROCEDURE (cont'd)

12. Brief crews on the action plan, safety plan, communication plan and waste management plan.

Once work begins:

13. Outline slot and deflector wall locations with spray paint:
 - Determine the size of slot blocks and mark the dimensions.
 - Auger holes in the centre of the slot blocks.
 - Saw the slot sides, starting at the downstream end of the slot.
 - Crosscut the slot sides to form blocks.
 - Remove the blocks, and transport and store them nearby for later reinsertion.
 - Saw deflector wall slots in two parallel cuts.
 - Install plywood in the slots.
 - Use wedges to secure the plywood in the slots.
14. Install a skimmer at the downstream end of the slot.
15. Ensure that the slot surface is kept free of ice.
16. Ensure that the skimmer access is kept free of ice.
17. Use a vacuum truck to remove the product for disposal.
18. Use tanks to store recovered product and water.
19. Dispose of waste according to the Waste Management Plan.

As soon as possible:

20. Initiate an event report, including details of spilled product, spill size, location, status, injuries, downstream control points (if there is any open water) and weather forecast.
21. Report any releases to the NWT 24-hour spill reporting line.

**SPILL PREVENTION AND RESPONSE****MACKENZIE DELTA
EMERGENCY RESPONSE PLAN****DIESEL LEAK FROM AN ICED-IN BARGE**

GENERAL

Barges will be used to transport fuel to support construction, drilling, seismic and testing operations. Barges will be staged with fuel stored in the centre cells. No fuel will be placed in the outer storage cells. Each spill will require a varied response, depending on the specific situation. The response might range from no action to attempting to recover whatever amount of spilled diesel can be found.

RESPONSE PROCEDURE

Assess the extent of diesel contamination:

1. Drill auger holes in the ice at intervals downstream of the source of the leak to determine the areal extent and quantity of diesel spilled.
2. Look for a hydrocarbon sheen on the water.

To locate the source of the leak:

3. Cut the ice on the river side of the barge, using an ice saw sleigh, starting at the downstream end of the barge.
4. Cut the ice 0.3 m from the barge hull along the entire length of the barge.

When the source of the leak has been found:

5. Transfer the remaining diesel in the leaking tank to a secure tank.
6. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
7. Report any releases to the NWT 24-hour spill reporting line.

To recover spilled diesel trapped under the ice:

8. Follow the response steps outlined in the Spills Under Ice procedure.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SPILLS ON ICE

RESPONSE PROCEDURE

If a spill occurs on ice:

1. Ensure that any personnel in the spill area are safe.

As soon as possible:

2. Mobilize spill response equipment, as necessary.
3. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
4. Report any releases to the NWT 24-hour spill reporting line.

Before deploying work crews:

5. Perform an ice safety assessment.
6. Ensure that the crew is safely belted with manned ropes.
7. Clear snow on an approved location.
8. Establish a controlled access point to the site.
9. Use a check-in and out procedure.
10. Locate a decontamination station, if required.

Once cleanup begins:

11. Contain the spill by constructing snow dikes or ice trenches around the perimeter of the spill.
12. Prevent product escaping into ice cracks by using dikes or sealing cracks with a snow and water mixture.
13. Pick up contaminated snow and remove to a designated storage area for evaporation and temporary storage of residue.

RESPONSE PROCEDURE (cont'd)

If the spill is moving towards open water:

14. Obtain regulatory approval to burn the product.

If the spill is large:

15. Recover pumpable product with a vacuum truck and store it in secure tanks.
16. Dispose of waste according to the Waste Management Plan.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

LEAK DURING FUEL TRANSFER

APPROACH TO RESPONSE

A fuel spill while transferring liquids or fuel from a storage tank to a vehicle or from a tanker truck to tanks and other fuel containers is the most likely type of spill to occur. Prevention and awareness are critical.

RESPONSE PROCEDURE

To minimize the likelihood of a fuel release:

- Use dedicated fuel and fluid transfer personnel, and follow the barge contractor's written procedures.
- Ensure that tank trucks have absorbents, drip trays and a scoop shovel.
- Ensure that drip trays and secondary containment are always used under connections.
- Use absorbent pads under fuel transfer operations.
- Ensure that tank gauging is accurate before transfer and monitor frequently during the transfer.
- Maintain constant dedicated attention during fuel transfer operations.
- Avoid the tendency to top up a tank when refuelling.

When fuel is being transferred from barges to tankage, such as at Camp Farewell, use the barge contractor's fuel transfer procedures. This includes having personnel positioned along the load-out or transfer line during pumping operations.

If a release occurs, follow the general spill response procedures outlined in this Spill Response Plan.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

LEAK DURING FUEL TRANSFER FROM BARGE

GENERAL

Barges will be used to transport fuel to support construction, drilling, seismic and testing operations. Barges might be overwintered or fuel transferred to depots for later use.

RESPONSE PROCEDURE

Pipeline or Hose Leakage

When a leak in a pipeline or hose is discovered during a fuel transfer from a barge:

1. Stop all transfer operations immediately.
2. Close all manifold valves.
3. Sound the general emergency alarm.
4. Initiate emergency response procedures.
5. Inform the loading master about the incident.
6. Consider whether to stop air intake into accommodation and non-essential air intake to the engine room.
7. Locate the source of the leakage.
8. Begin cleanup procedures.
9. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
10. Report any releases to the NWT 24-hour spill reporting line.

If it is possible to transfer spilled oil into an empty tank, such as the slop tank or another oil tank:

11. Prepare the transfer pump.
12. Drain the affected section of the pipeline into an empty tank.

Pipeline or Hose Leakage (cont'd)

If the source of the leakage is located in the engine room at the suction manifold:

13. Take the necessary measures to relieve the pressure from the relevant section of the pipeline.

If the spilled oil is contained onboard and can be handled by the vessel crew:

14. Use absorbents and permissible solvents to clean up the spill.
15. Ensure that any residue collected in the cleanup operation is stored carefully.
16. Dispose of the residue properly.

When the spill has been cleaned up:

17. Obtain permission from local authorities to continue normal operations, if necessary.

Tank Overflow During Cargo Transfer

When a tank overflow is discovered during a cargo transfer:

1. Stop all transfer operations immediately.
2. Close all manifold valves.
3. Sound the general emergency alarm.
4. Initiate emergency response procedures.
5. Inform the loading master personnel about the incident.
6. Consider whether to stop air intake into accommodation and non-essential air intake to the engine room.
7. Reduce the tank level by discharging tanks to tanks on shore or another barge, if necessary.
8. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
9. Report any releases to the NWT 24-hour spill reporting line.

If it is possible to transfer spilled oil into an empty tank:

10. Prepare portable pumps and transfer the oil.

If the spilled oil is contained onboard and can be handled by the vessel crew:

11. Use absorbents and permissible solvents to clean up the spill.
12. Ensure that any residue collected in the cleanup operation is stored carefully.
13. Dispose of the residue.

When the spill has been cleaned up:

14. Obtain permission from local authorities to continue normal operations, if necessary.

Hull Leakage During Cargo Transfer

If oil is noticed on the water near the barge during cargo transfer operations and cannot be accounted for, the possibility of hull leakage should be investigated immediately:

1. Stop all transfer operations immediately.
2. Close all manifold valves.
3. Sound the general emergency alarm.
4. Initiate emergency response procedures.
5. Inform the loading master about the incident.
6. Use the vessel crew in an attempt to locate the source of the leakage.
7. Consider whether to stop air intake into accommodation and non-essential air intake to the engine room.

When the source of the leak has been identified:

8. Reduce the head of cargo oil by transferring it into an empty or slack tank.
9. Consider pumping water into the leaking tank to create a water cushion to prevent further oil loss (loading a water cushion will displace the fuel above the hull breach).
10. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
11. Report any releases to the NWT 24-hour spill reporting line.

If the leak is located below the waterline:

12. Use divers to investigate the leak further.

Hull Leakage During Cargo Transfer (cont'd)

If it is not possible to identify the specific tank that is leaking:

13. Reduce the level of oil in all of the tanks.



Section 6.10 SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SUMMER SPILLS IN WATER

RESPONSE PROCEDURE

If a spill occurs in water:

1. Ensure that any personnel in the spill area are safe.
2. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
3. Report any releases to the NWT 24-hour spill reporting line.
4. Mobilize spill response equipment, as necessary.
5. Contain the spill, using booms or absorbents to prevent the spill from becoming larger.
6. Use a skimmer to recover spilled product and store it in drums or approved tanks.

If the spill is large:

7. Recover pumpable product with a vacuum truck and store it in secure tanks.
8. Dispose of waste according to the Waste Management Plan.



SPILL PREVENTION AND RESPONSE

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

SUMMER SPILLS ON LAND

RESPONSE PROCEDURE

If a spill occurs on land in summer:

1. Ensure that any personnel in the spill area are safe.
2. Initiate an event report, including details of spilled product, spill size, location, status and injuries.
3. Report any releases to the NWT 24-hour spill reporting line.
4. Mobilize spill response equipment, as necessary.
5. Contain the spill, using dikes or containment booms or drainage trenches to prevent liquids from migrating.

If the spill is large:

6. Recover pumpable product with a vacuum truck and store it in secure tanks.

If a vacuum truck is not available:

7. Use absorbent pads and booms to recover the product.
8. Dispose of waste according to the Waste Management Plan.



EMERGENCY RESPONSE FOLLOW-UP

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

STAND DOWN – DEMOBILIZATION

POST INCIDENT ACTIVITIES

CEMT Stand-Down Notification – Emergency Manager

The emergency manager is responsible for coordinating post-incident activities. These activities include:

- notifying the CEMT to stand down
- preparing and releasing a statement to the media, as required
- providing updates to employees and contractors about the incident
- notifying and holding debriefing meetings with stakeholders, as required
- providing support to the CEMT and OERT, as required

CEMT and OERT Stand-Down Notification – Incident Commander

The incident commander:

- ensures that all OERT members are notified about the incident stand-down
- ensures that all external contacts, such as government officials and community contacts, are notified about the stand-down
- advises all CEMT and OERT members to document their participation and call-down notifications
- manages emergency response records

CEMT and OERT Support

The incident commander supports the CEMT by:

- ensuring that ongoing support is provided to the affected public
- supporting MGM Energy on-scene personnel, where necessary, by contacting and, if necessary, visiting members of the public who have been directly affected by the incident, and helping to address any outstanding concerns or problems they might have

CEMT and OERT Support (cont'd)

- providing, where required, affected members of the public with post-incident MGM Energy contacts and telephone numbers. If an incident has affected many members of the public, a public relations office should be set up in the affected community for as long as deemed necessary.
- scheduling follow-up meetings with the public to ensure that concerns are fully addressed
- dealing with all public damage claims promptly

COMMUNICATIONS

The incident commander ensures that all communication issues are addressed following the incident. This includes communications with the public, communities, media, governments and investor relations, in conjunction with the emergency manager.

INCIDENT RECORDS MANAGEMENT

The incident commander:

- collects and compiles all incident records, time and event logs, forms and other documentation that might be relevant to the incident
- obtains copies of the original documents and works only from the copies
- stores all incident documentation securely
- ensures that all reports are provided to senior management, as required



Section 7.2 EMERGENCY RESPONSE FOLLOW-UP

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

POST-EMERGENCY DEBRIEFING

PURPOSE

Within a few days of the incident, debriefing sessions should be held with the CEMT and OERT leaders. These sessions should focus on the effectiveness of the response and opportunities for improvement.

The sessions should be recorded and any agreed-upon changes incorporated into the response plans, where applicable.

DEBRIEFING EVALUATION

As a minimum, the debriefing should include an evaluation of:

- the overall effectiveness of the emergency response – by those on the scene (OERT) and the CEMT
- the systems used for internal and external communications
- the effectiveness of communication efforts with the community, media and government
- public safety actions
- assessments of legal or environmental issues raised because of the incident or as a result of MGM Energy's response actions
- plans to reduce the risk of a similar incident occurring, including recommendations for future actions and improvements to the emergency preparedness program



Section 7.3 EMERGENCY RESPONSE FOLLOW-UP

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

INCIDENT INVESTIGATIONS

INVESTIGATIONS AND REPORTING

An incident investigation and associated reports must be completed, following the requirements identified in MGM Energy's incident reporting and follow-up requirements, as detailed in the MGM Energy HSE Manual.

Ensure that the on-site MGM Energy supervisor receives the support required to assist in the incident investigation process.

Obtain a copy of the incident investigation report and follow-up documentation to assist in the debriefing meetings.

Sometimes it might become necessary for MGM Energy investigators to obtain permission from regulatory agencies to conduct an investigation following an incident. In certain incidents, the regulating body has jurisdiction over an incident investigation because the regulator is directly responsible for identifying the cause of the incident. In such cases, the regulator becomes the prime investigator.

THIRD-PARTY INVESTIGATIONS

When third-party investigations by regulators, insurance companies and others are required, given the complexity and severity of the incident, it is important to cooperate fully with them. The following guidelines should be adhered to:

- give third-party investigators only the information they request
- speak truthfully and do not speculate
- ensure that legal counsel is present if the investigator is from a body with the authority to prosecute or file civil claims



FORMS

**MACKENZIE DELTA
EMERGENCY RESPONSE PLAN**

INTRODUCTION

SCOPE

This section contains examples of the following forms:

- Environmental Emergency Incident Fact Sheet
- Hazardous Occurrence Investigation Report
- Incident Action Plan
- Incident Status Update
- Initial Emergency Incident Fact Sheet
- Media Inquiry Form
- NWT Spill Report
- Operational Period Handover Report
- Preliminary Media Statement and News Release Template
- Resources Summary
- Site Safety/Evacuation Plan
- Time and Event Log

Environmental Emergency Incident Fact Sheet
(Also Information for Media Spokesperson)

Date: _____
Time: _____ (Hrs. 0-2400)

Initial Incident Notification

Caller's Name: _____
Caller's Address: _____
Caller's Phone Nos. Home _____ Work _____ Mobile _____

Type of Emergency/Release

Stage/ level of alert 1 ☐ 2 ☐ 3 ☐ Other ☐ (Specify) _____
Sweet Gas ☐ Sour (H₂S) Gas ☐ HVP Liquid ☐ Crude Oil ☐ Salt Water ☐ Emulsion ☐
Fire ☐ Hazardous Chemical/Dangerous Good ☐ (Specify – include manufacturer & U.N. No.)
Other ☐ (Specify) _____
Released onto/into: Air ☐ Land ☐ Water ☐ Water Conditions: Open ☐ Ice ☐
Injuries ☐ Operator/Contractor (Explain) _____
Fatalities ☐ Operator/Contractor (Explain) _____

Location/Source and Time of Incident

Operator of Record for the Operation: _____
Type of Operation:
Seismic ☐ Drilling ☐ Construction ☐ Marine ☐ Aviation ☐ Motor Vehicle ☐
Field/Area _____ Location (Lsd.) _____
Proximity to and name of nearest village/town/city _____
Plant ☐ Well ☐ Pipeline ☐ Surface facility (Specify) _____ Truck ☐ Tank car ☐
Marine vessel ☐ Helicopter ☐ Fixed Wing aircraft ☐
Name of consignor & carrier (Dangerous Good) or contractor _____
Time of incident or discovery _____ (Hrs. 0-2400)
What was damaged/destroyed (i.e., facility, property)? _____
Estimated volume lost/rate _____ Size of spill area _____

Emergency Area Description

Forest ☐ Field ☐ Muskeg ☐ Hills ☐ Flat ☐ Near waterways ☐ Tundra ☐
Marine ☐ Ice road ☐ Permanent road ☐
Near residents ☐ Near campground ☐ Near public facility ☐
Distance to nearest residence/campground/public facility: _____
Are any people in immediate danger? Yes No Have residents been notified? Yes ☐ No ☐
Has anyone evacuated the area? _____
Where have evacuees been sent? _____

Environmental Emergency Incident Fact Sheet (continued)

Road access/conditions: _____			
Other access/conditions: (marine, air) _____			
If a gas release, what equipment is near it? _____			
Can you smell gas?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If yes, from how far? _____
Can you hear it?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If yes, from how far? _____
Can you see it?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If yes, from how far? _____
Has H ₂ S/HVP gas release been ignited?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Have possible sources of ignition been extinguished?	Facilities Resident	Yes <input type="checkbox"/> Yes <input type="checkbox"/>	No <input type="checkbox"/> No <input type="checkbox"/>

Actions Taken To Control Release

Has source of emission been shut off?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
If No, can source be easily shut off?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
What is the spill migration potential?	_____	
Action taken to control release/prevent spread of spill: _____		

Weather Conditions

Wind Direction: _____	Wind Speed: _____ km/hr	Wind Gusts	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Visibility _____				
Other Weather Conditions (Specify): _____				

Other Contacts Caller Has Already Made

RCMP: _____	GOVERNING AGENCY: _____
DISASTER SERVICES: _____	ENVIRONMENT: _____
AMBULANCE: _____	Others: _____
Inuvialuit Regional Corporation	
National Energy Board (NEB)	
Department of Indian and Northern Affairs (DIAND)	
Department of Fisheries and Oceans (DFO)	
Update with others as appropriate	

Information Taken By

Name: _____	Phone No. _____
Position: _____	Location: _____

Environmental Emergency Incident Fact Sheet (continued)

Describe the area of the incident:

Site Drawing:

A large grid of graph paper, consisting of 20 columns and 20 rows of squares. In the top right corner, there is a compass rose with four arrows pointing up, down, left, and right. Below the compass rose, the text "Indicate North" is written in a bold, sans-serif font.

Containment and Recovery: Describe the spill containment and recovery procedures being implemented.

Hazardous Occurrence Investigation Report

SCHEDULE I / ANNEXE I (SUBSECTION 16.4(3) / PARAGRAPHE 16.4(3))	TYPE OCCURRENCE / GENRE DE SITUATION <input type="checkbox"/> Fire / Explosion <input type="checkbox"/> Death / Décès <input type="checkbox"/> Disabling Injury / Blessure entraînant une invalidité <input type="checkbox"/> Emergency Procedure / Procédures d'urgence <input type="checkbox"/> Other / Autre _____ <i style="margin-left: 150px;">Specify / Préciser</i>		Department File No. / No de dossier du ministère Regional Office / Bureau régional Employer ID No. / Numéro d'identification de l'employeur
HAZARDOUS OCCURRENCE INVESTIGATION REPORT RAPPORT D'ENQUÊTE DE SITUATION HASARDEUSE			
Employer Name and Mailing Address / Nom et adresse postal de l'employeur	Telephone Number / Numéro de téléphone	Operator / Exploitant	
	Supervisor's Name / Nom du surveillant		
	Witnesses / Témoins		
	Weather / Conditions météorologiques		
ID of Drilling Rig, Drilling Unit, Production Facility, or Support Craft / Identification de l'appareil de forage, installation de forage, installation de production ou du véhicule de service		Date and Time of Hazardous Occurrence / Date et heure de la situation hasardeuse	
Description of what happened / Description des circonstances			
Description and estimated cost of property damage / Description et coût estimatif des dommages matériels			Operation in progress / Opération en cours
Injured Employee's Name (if applicable) / Nom de l'employé blessé (s'il y a lieu)	Age / Âge	Occupation / Profession	
		Years of experience in occupation / Nombre d'années d'expérience dans la profession	
Description of Injury / Description de la blessure	Sex / Sexe	Nationality / Nationalité	
	Evacuation / Évacuation	Direct cause of injury / Cause directe de la blessure	
Was training in accident prevention given to injured employee in relation to duties performed at the time of the hazardous occurrence? L'employé blessé a-t-il reçu un entraînement en prévention des accidents relativement aux fonctions qu'il exerçait au moment de la situation hasardeuse?			
Yes / oui <input type="checkbox"/> No / non <input type="checkbox"/> Specify / Préciser _____			

Hazardous Occurrence Investigation Report (continued)

Direct causes of Hazardous Occurrence / Causes directes de la situation hasardueuse		
Corrective action and date employer will implement / Mesures correctives qui seront appliquées par l'employeur et date d'entrée en vigueur		
Supplementary preventative measures / Mesures supplémentaires de prévention		
Name of person investigating / Nom de la personne menant l'enquête	Signature / Signature	Date / Date
Title / Titre	Telephone Number / Numéro de téléphone	
Safety & Health Committee Member or Representative's Name / Nom du membre du comité d'hygiène et de sécurité ou du représentant à l'hygiène et à la sécurité	Signature / Signature	Date / Date
Title / Titre	Telephone Number / Numéro de téléphone	
Name of person representing the Operator / Nom de la personne représentant l'exploitant	Signature / Signature	Date / Date
Title / Titre	Telephone Number / Numéro de téléphone	

Lab/Trav 369 (Revised 7/87)

(Continue on reverse side if needed / Continuer au verso si nécessaire)

COPIES 1 & 2 to R.S.O., COPY 3 to the Safety and Health Committee or Representative, COPY 4 to the Employer /
COPIES 1 ET 2 à A.R.S., COPIE 3 au Comité d'hygiène et de sécurité ou au représentant, COPIE 4 à l'employeur

Incident Action Plan

Incident Name:			
Report #:	Operational Period: from		to
Prepared By:		ERT Position:	
Date Prepared:		Time Prepared:	(hours 00:00 – 24:00)

Issues Identified During the Last Incident Assessment: Owner? Status?

--

Objectives for the Next Operational Period: Owner? Completed by?

--

Response Actions to be Taken in the Next Operational Period (*containment, recovery, clean-up, etc.*): Owner? Completed by?

--

Incident Action Plan (continued)

Safety Issues/Concerns

INCIDENT BRIEFING

Summary of Current Actions

Incident Action Plan (continued)

MAP SKETCH

Incident Status Update

Incident Name: _____	Status Report #: 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> ____ <input type="checkbox"/>
Report #: _____	Operational Period: from _____ to _____
Prepared By: _____	ERT Position: _____
Date Prepared: _____	Time Prepared: _____ (hours 00:00 – 24:00)

Where lengthy notes are required use additional pages:		Page ____ of ____	
CURRENT CLASSIFICATION / EMERGENCY LEVEL:		Level 1 <input type="checkbox"/>	Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/>
Incident Location: _____			
Nature of Incident (type, behaviour, current information) _____			
Situation is:		Stable <input type="checkbox"/>	Unstable (could get worse) <input type="checkbox"/>
Describe: _____ _____			
Modifying Conditions (location, time, weather) _____			
Describe: _____ _____			
Potential Risk (See Levels of Emergency)			
People (workers, responders, public):		Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic	Assets / Revenue Loss: Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic
Environment:		Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic	Reputation Exposure: Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic
Control Measures			
Internal Resources:		Incident Commander	
		Name _____	Contact # _____
External Resources:		On-Site Supervisor or On-Scene Commander	
		Name _____	Contact # _____
Government Agency Notified / Involved:		Emergency Manager	
		Name _____	Contact # _____
Critical Issues			
Priority	Issue	Assigned To	Completed?

Initial Emergency Incident Fact Sheet

INCIDENT	Date & Time Occurred:		Reported By:
WHAT HAPPENED? (KNOWN FACTS ONLY)			
INCIDENT LOCATION	<input type="checkbox"/> Construction <input type="checkbox"/> Drilling <input type="checkbox"/> Seismic	<input type="checkbox"/> Access Road <input type="checkbox"/> Lease <input type="checkbox"/> Camp	<input type="checkbox"/> Aircraft <input type="checkbox"/> Motor Vehicle <input type="checkbox"/> Other:
EMERGENCY TYPE	<input type="checkbox"/> Injury <input type="checkbox"/> Environmental <input type="checkbox"/> Equipment Damage <input type="checkbox"/> Other:	Brief Description: Actual or Probable Spill?	Classification <input type="checkbox"/> Level I <input type="checkbox"/> Level II <input type="checkbox"/> Level III
INJURIES <input type="checkbox"/> YES <input type="checkbox"/> NO	Estimate Number:	Nature of Injuries: Has Medical Assistance been called?	Immediate Danger to Others? <input type="checkbox"/> YES <input type="checkbox"/> NO Of What Nature?
POTENTIAL IMPACT	How large is the problem? Size of Spill (Note scope of fire, area of damage, release rate etc.)	Incident Status: <input type="checkbox"/> Terminated <input type="checkbox"/> Continuing <input type="checkbox"/> Escalating	
ENVIRONMENTAL CONDITIONS (SS)	Wind Speed: <input type="checkbox"/> Light <input type="checkbox"/> Moderate <input type="checkbox"/> Strong <input type="checkbox"/> Gusting Wind Direction: Visibility: <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good Air Temperature: °C		
INITIAL CONTROL MEASURES	Is the Incident under control? What steps have been taken to secure the Incident and to reduce its impact? Resources Required?		
EXTERNAL ASSISTANCE	Have other departments or agencies been contacted? Is government assistance required? (Specify what is required)		
POTENTIAL HAZARDS	Are there hazards to persons/property/wildlife (birds, fish, Mammals)? (Specify)		
RECOMMENDATIONS AND/OR REMARKS			
NOTIFICATION	List contacts made (NEB, WCB, IRC, NWT Spill Line, Police, Fire, Hospital, etc.):	Who has information been passed to: Date: _____ Time: _____	
UPDATES	Time of Next Report/Update Call?		

Media Inquiry Form

Use this form to document media calls, whenever you cannot transfer the reporter directly through to the Media spokesperson. Use the following prompts as a guide to gather key information.

1. "We have a **spokesperson** to answer your questions.
His/Her name is _____"
2. If I could get a bit of information from you, I will make sure that
_____ (Media Spokesperson's Name) gets this message **immediately**,
so that you can be called as soon as information is available.

DATE	TIME	INFORMATION RECORDED BY:	
REPORTER'S NAME	First Name	Last Name	
MEDIA AFFILIATION	Area Code	Number	
PHONE NUMBER			
FAX NUMBER			
DEADLINE?			
INFORMATION REQUESTED			

3. "I don't have any information but I'll **expedite** your inquiry to our **spokesperson** who will get back to you as soon as possible."

Deliver this information to the Media Spokesperson – IMMEDIATELY.

NWT Spill Report

A Report date and time	B Date and time of spill (if known)	C Original Report Update Report	Spill Number
D Location and map coordinates (if known) and direction (if moving)			
E Party Responsible for Spill			
F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)			
G Cause of Spill			
H Is spill terminated? Yes No	I If spill is continuing, give estimated rate	J Is further spillage possible Yes No	K Extent of contaminated area (m ²)
L Factors affecting spill recovery (weather conditions, terrain, snow cover, etc)		M Containment (natural depression, dykes, etc.)	
N Action, If any, taken or proposed to contain, recover, cleanup or dispose of product(s) and contaminated materials			
O Do you require assistance?		P Possible hazard to persons, property, or environment	
Q Comments and recommendations			For Spill Line Use Only Lead Agency Spill Significance Lead Agency Contact and Time Is the file now closed?
Reported By:	Position, Employer, Location:		Telephone
Reported To:	Position, Employer, Location		Telephone

Operational Period Handover Report

Incident Name: _____	
Report #: _____	Operational Period: from _____ to _____
Prepared By: _____	ERT Position: _____
Date Prepared: _____	Time Prepared: _____ (hours 00:00 – 24:00)

CURRENT CLASSIFICATION/EMERGENCY LEVEL: Level 1 <input type="checkbox"/> Level 2 <input type="checkbox"/> Level 3 <input type="checkbox"/>	
Incident Location: _____	
What has Occurred: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Personal Injury <input type="checkbox"/> Explosion <input type="checkbox"/> Fire <input type="checkbox"/> Gas Release </div> <div> <input type="checkbox"/> Spill <input type="checkbox"/> Vehicle Collision <input type="checkbox"/> Well Blow-out <input type="checkbox"/> Terrorism </div> </div>	Incident Description/Current Status:
OFFSHORE	ONSHORE
TYPE OF FACILITY: <input type="checkbox"/> Marine Vessel <input type="checkbox"/> Onshore Drilling <input type="checkbox"/> Offshore Platform <input type="checkbox"/> Offshore Drilling <input type="checkbox"/> Other _____	TYPE OF FACILITY: <input type="checkbox"/> Gas Plant <input type="checkbox"/> Office <input type="checkbox"/> Production Field/Facility <input type="checkbox"/> Surface Trucking <input type="checkbox"/> Other _____
VESSEL/EQUIPMENT: Vessel Name: _____ Call Sign: _____ Flag: _____ Vessel Size/Type/Cargo: _____ Vessel Destination and ETA: _____ Equipment Description/Type: _____ Name of Owner or Rep: _____ Location: _____ Phone: _____	VEHICLE/EQUIPMENT: Vehicle Name/Number: _____ Vessel/Type/Cargo: _____ Vessel Destination and ETA: _____ Equipment Description/Type: _____ Name of Owner or Rep: _____ Location: _____ Phone: _____
WEATHER/SEA CONDITIONS: Air Temp: _____ °F/°C Wind Speed: _____ mph - knots - m/s Direction from: _____ to: _____ Precipitation/Humidity: _____ Visibility: _____ Water Temperature: _____ Forecast Air Temp: _____ Wind: _____ Forecast Precipitation: _____ Sea State: 1 - 2 - 3 - 4 - 5 - 6 Ave Wave Height __ ft - m Tide State: _____ Currents: _____ Speed: _____ mph - knots - m/s Direction From: _____ To: _____ Forecast and Remarks: _____	WEATHER CONDITIONS: Air Temp: _____ °F/°C Wind Speed: _____ mph - knots - m/s Direction from: _____ to: _____ Precipitation/Humidity: _____ Visibility: _____ Water Temperature: _____ Forecast Air Temp: _____ Wind: _____ Forecast Precipitation: _____

Operational Period Handover Report (continued)

Casualties:			
Please state number of each:	Employees	Contractors	General Public
Fatalities			
Hospitalizations			
Medical Treatments			
Evacuation in Progress? <input type="checkbox"/> YES <input type="checkbox"/> NO By Whom/Details: _____			
Gas Release: Type(s) of Gas: _____ Size of Release: _____ Duration: _____ Direction: _____ Population Impact: _____		Spill: Spill Observed: Date: _____ Time: _____ By Whom: _____ Company: _____ Spill Occurred: Date: _____ Time: _____ Apparent Source: _____	
Media: Media Type/Name <input type="checkbox"/> Local _____ <input type="checkbox"/> Regional _____ <input type="checkbox"/> National _____ <input type="checkbox"/> International _____		Is Spill Continuing? <input type="checkbox"/> YES <input type="checkbox"/> NO If YES, estimate release rate: _ gal/day-bbl/day-m ³ /day Spill Type: <input type="checkbox"/> Crude <input type="checkbox"/> Diesel <input type="checkbox"/> Condensate <input type="checkbox"/> Other: _____	
Government/Agency Involvement: Provincial: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ Federal: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ International/U.S.: <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____		API Gravity _____ ° Viscosity _____ cSt Volume of Spill: _____ bbl – gal – litre – m ³ Estimated: _____ Known? _____ Current Spill Location: Lat: _____ Long: _____ Ground Reference: Movement _____ Direction: _____ Appearance (slick rainbow, sheen): _____ Shape (wind rows, patches): _____ Size: _____ Affected Water Body: _____ Probable Coastal Impact Site: _____ Habitat at Site: _____	
		Public Statement Available? <input type="checkbox"/> YES <input type="checkbox"/> NO	
		Statement Issued? <input type="checkbox"/> YES <input type="checkbox"/> NO	

Operational Period Handover Report (co ntinued)

Public Statement Available? <input type="checkbox"/> YES <input type="checkbox"/> NO									
Statement Issued? <input type="checkbox"/> YES* <input type="checkbox"/> NO *If yes, please fill in the following information for each statement issued									
Statement Number	Issued by	Date	Time	Presented by	Date	Time	To Whom?	Name	Media Type
Interviews Planned? <input type="checkbox"/> YES <input type="checkbox"/> NO *If yes, please fill in the following information for each interview									
Interview Number	Presented by	Date	Time	To Whom?	Name	Media Type			
Potential Risk (See Levels of Emergency)									
People (workers, responders, public):				Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic		Assets/ Revenue Loss:		Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic	
Environment:				Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic		Reputation:		Minor <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Catastrophic	
Control Measures									
Internal Resources:									
External Resources:									
Government Agency Notified/Involved:									
Critical Issues									
Priority	Issue			Assigned To			Completed?		

Preliminary Media Statement and News Release Template

Used by: Information Lead/Media Spokesperson

Field-based Information Officer *(For First Hours Response)*

Date: _____ Time: _____

My name is _____

At _____ *(time)* on _____ *(date)* a _____

(nature of accident) occurred at _____ *(plant, wellsite,*

pipeline) located approximately _____ kilometres *(east, west, south, north)* of

_____ *(nearest town or city)*.

The _____ *(plant, wellsite, pipeline)* has been shut down and isolated.

MGM Energy has activated its emergency response plan to protect the public, our employees and the environment.

Presently, _____ *(number of)* people are being treated for injuries. The names and condition of the injured are not being released at this time.

The cause of the _____ *(nature of accident)* is not yet known and we don't have an estimate of damage at this time. A subsequent investigation will determine those facts.

I will release further information as it becomes available or for updates you can contact me at

_____ *(phone number)*.

Resources Summary

Incident Name:	_____			
Page:	_____ of _____	Operational Period: from	_____ to	_____
Prepared By:	_____	ERT Position:	_____	
Date Prepared:	_____	Time Prepared:	_____ (hours 00:00 – 24:00)	

Resources Required	Resources Ordered	ETA (hours)	On Scene	Location/Assignment

Site Safety/Evacuation Plan

Incident Name: _____
Report #: _____ Operational Period: from _____ to _____
Prepared By: _____ ERT Position: _____
Date Prepared: _____ Time Prepared: _____ (hours 00:00 – 24:00)

Facility/Site

Name: _____

Site Location (Address, Legal Description, GPS or LSD coordinates): _____

Directions to Site: _____

Emergency Response Numbers

Contact	Location	Telephone
Police		
Fire		
Ambulance		
Hospital		

Company Contacts

Name	Position	Location	Telephone #	Cell/Other #
MGM 24 hour Emergency Number:		Calgary		

Site Safety/Evacuation Plan (continued)

Site Plan

Indicate locations of designated On-Site Command Post, fire extinguishers, designated mustering points, (ESD switch, main power switch), first aid kits, monitoring equipment, and other appropriate information on the diagram.

Designated Mustering Points (worker assembly areas)	
Primary	
Secondary	
Alarm Procedures	

Time and Event Log

Incident Name:	_____		
Page:	_____ of _____	Operational Period: from _____	to _____
Prepared By:	_____	ERT Position:	_____
Date Prepared:	_____	Time Prepared:	_____ (hours 00:00 – 24:00)

Time (24h clock)	Call To	Call From	Telephone Number	Topic/Remarks



Section 9.1
ERP ADMINISTRATION AND IMPLEMENTATION

**MACKENZIE DELTA
EMERGENCY RESPONSE PLAN**

ERP DISTRIBUTION

DISTRIBUTION LIST

Tables 9-1 and 9-2 list the current holders of the Emergency Response Plan.

Table 9-1: Emergency Response Plan Distribution List – MGM Internal

Copy No.	Holder's Name	Organization	ERT Role or Position
1	Henry Sykes	MGM Energy Corp	Executive Lead/ Human Resources Lead
2	Gary Bunio	MGM Energy Corp	Emergency Manager
3	John Hogg	MGM Energy Corp	Emergency Manager
4	Nancy Dilts	MGM Energy Corp	Legal Advisor/ Communications Lead/ Media Spokesperson
5	Rick Miller	MGM Energy Corp	Finance Lead
6	Dick Heenan	MGM Energy Corp	Incident Commander
7	Ron Feschuk	MGM Energy Corp	Incident Commander
8	Rob Carss	MGM Energy Corp	Incident Commander/ HSE & Security Officer
9	Ed Kustan	MGM Energy Corp	HSE & Security Officer
10	Don Casey	MGM Energy Corp	HSE & Security Officer
11	John Ferris	MGM Energy Corp	Planning Chief/ Finance and Administration Chief
12	Glenn Miller	MGM Energy Corp	Government and Community Relations
13	Alistair Sim	Frontier Logistics	Logistics and Procurement Chief
14	Dan Fensky	MGM Energy Corp	Logistics and Procurement Chief
15	Brian Cameron	MGM Energy Corp	IT Specialist
16	Brad Scott	MGM Energy Corp	Technical Specialist - Drilling

Table 9-1: Emergency Response Plan Distribution List – MGM Internal – (cont'd)

Copy No.	Holder's Name	Organization	ERT Role or Position
17	Stewart Gall	Aguila Exploration	Technical Specialist - Seismic
18	Jerry Bulman	Park Valley	Technical Specialist - Construction
19	Kristen Verberne	MGM Energy Corp	Administrative Support
20	John Williams	MGM Energy Corp	On Scene Commander - Drilling
21	Fred Svenko	MGM Energy Corp	On Scene Commander - Drilling
22	Ron Krinke	Park Valley	On Scene Commander – Construction/ Operations Section Chief Construction
23	Kris Kobbero	Park Valley	On Scene Commander – Construction/ Operations Section Chief Construction
24	Blaine Gervais	Aguila	On Scene Commander – Seismic
25	TBD	TBD	On Scene Commander – Testing/ Operations Section Chief - Testing
26	HSE Field Coordinator Construction	MGM Energy Corp	
27	HSE Field Coordinator Drilling	MGM Energy Corp	
28	HSE Field Coordinator Testing	MGM Energy Corp	
29	HSE Field Coordinator Seismic	MGM Energy Corp	
30	Wayne Ross	MGM Energy Corp	Expeditor/ Government and Community Liaison
31	Rig Manager	Akita	Operations Section Chief - Drilling
32	Program Manager	Veri- Illuq	Operations Section Chief – Seismic
33-37	EOC – Calgary	MGM Energy Corp	Spare Copies
38-40	MGM Office - Inuvik	MGM Energy Corp	Inuvik Office Copies

Table 9-2: Emergency Response Plan Distribution List – External

Copy No.	Holder's Name	Organization	ERT Role or Position
41	Kirk VanderPloeg	NTCL	Barging Contractor
42	Rob Hunt	MDIOS (Horizon) - Inuvik	Wurmlinger Vessel
43	Dave Millar	Akita – Inuvik Office	Akita EOC - Inuvik
44	HSE Manager	Akita – Nisku Office	Drilling Contractor Head Office
45	Lawrence Verlaan	Aguila Exploration	Seismic Contractor Head Office
46	TBD	TBD	Completion and Testing Contractor Head Office
47	Chief Conservation Officer	National Energy Board	Regulatory Agency
48	Operations Specialist	National Energy Board	Regulatory Agency
49-51	NEB	National Energy Board	Office Spares
52	Chair	Inuvialuit Land Administration	
53	Chair	Inuvialuit Regional Corporation	
54	Regional Manager	Indian and Northern Affairs Canada - Inuvik	Government Agency
55	Chairperson	Northwest Territories Water Board	Government Agency
56	Regional Office	Canadian Wildlife Service - Inuvik	Government Agency
57	Regional Manager	Environment Canada - Yellowknife	Government Agency
58	Regional Manager	Department of Fisheries and Oceans - Inuvik	Government Agency
59	Regional Manager	Government of the NWT – Department of Transportation - Inuvik	Government Agency
60	Chair	Environmental Impact Screening Committee	Regulatory Advisory Body
61	Director	MDSRC	Regional Spill Cooperative
62	Doug Connon	Chevron	Joint Venture Partner
63	Bob Ball	BP Canada	Joint Venture Partner



Section 9.2 ERP ADMINISTRATION AND IMPLEMENTATION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

ERP ADMINISTRATION

MAJOR ACTIVITIES

Staff in the HSE department are responsible for implementing and administering the Emergency Response Plan.

The administrative activities include:

- helping to develop individual and group training plans
- identifying and arranging for emergency equipment, including personal protective equipment (PPE) for responders
- helping to develop and, in some cases, executing team emergency response exercises and drills
- distributing and maintaining the ERP
- updating the ERP, including revising team roster and contact information and procedures
- implementing upgrades resulting from exercises and real emergency responses
- submitting ERP revisions to management for approval
- auditing the ERP on a routine basis

REVISING THIS PLAN

The HSE Manager is responsible for managing this ERP to ensure that the contents are kept current and its distribution is controlled. The plan will be revised at least once a year, normally in May, to reflect the specific work programs planned for the following 12 months.

Required corrections, and suggested additions or deletions, should be submitted to the HSE Manager via e-mail hsecalgary@mgmenergy.com.

Requested revisions will be reviewed by HSE and project management staff. Anyone requesting a revision will be informed of the disposition of the request.

REVISING THIS PLAN (cont'd)

Contact lists for emergency response team members, corporate contacts, government agencies and land administration authorities will be updated and a revised list distributed to holders of the plan within 15 days of the change being reported to the HSE and security officer.

Approved revisions will be issued to holders of the plan as replacement pages. Urgent revisions that cannot wait for the normal annual revision cycle will be issued as Bulletins. Each set of revisions and each Bulletin will include a brief explanation of the changes.

The distribution of the plan will be strictly controlled to ensure that those who need the plan receive all revisions as soon as they are issued, and that out-of-date information is removed and replaced with current material.



Section 9.3
ERP ADMINISTRATION AND IMPLEMENTATION

**MACKENZIE DELTA
EMERGENCY RESPONSE PLAN**

MAINTAINING THIS PLAN BULLETIN

**Mackenzie Delta
Emergency Response Plan**

Document Information

Section Title

Subject Title

Section Number

Date

Page

Reason for Revision

Revised Text

Approval (signature):

Date:

Controlled Copy Holder (signature):

Date:

NOTE TO CONTROLLED COPY HOLDERS: Sign off the bulletin page that's issued to you and forward a photocopy to the document owner for the project's quality records.



Section 9.4 ERP ADMINISTRATION AND IMPLEMENTATION

MACKENZIE DELTA EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE TRAINING

ERT TEAM ORIENTATION

All emergency response team members will receive an orientation to the emergency response plan, their role and the roles of the team members when they join the emergency response team.

The orientation will include:

- a discussion of fitness-for-duty requirements
- the role of the team
- their individual roles and responsibilities
- the location of the field EOC and Calgary EMC
- an overview of key response management processes
- their personal emergency response training plan

DRILLS AND EXERCISES

Emergency response exercises are organized activities that are designed to simulate a real emergency. These exercises give the team members an opportunity to practice their emergency response roles and the processes and relationships, both internal and external, associated with a response.

Three main types of exercises are held:

- communication exercises, where the procedures to contact emergency response team members and, in some cases, key response resources and regulators, are practiced
- tabletop exercises, where a simulated scenario is played out in a room, or within a series of adjacent rooms, to enable the response team members to practice response management skills and processes
- major, full-scale exercises, similar to a tabletop exercise, but which involves a simulated scenario with the added feature of deploying some emergency response equipment

MGM's program of exercises will use one of more of these exercise types each season to enable the emergency response team to practice and develop its emergency response management capabilities.

POST INCIDENT RESPONDER SUPPORT

In critical emergency response situations, emergency responders and others can be placed under enormous stress. The effects of this stress may manifest itself immediately or take some time to surface. When distress is manifested, the emotional and physical well-being of the responders and those around them is jeopardized.

The emergency manager and direct reports will consider the potential need for a critical incident stress debriefing intervention after each emergency response. If a critical incident stress management program is necessary, it will be offered to responders. All stress management programs arranged for emergency responders will be conducted by qualified personnel.

Appendix F NWT ENR 2005 Bear Encounter Response Guidelines: Oil and Gas Programs



10.11

**Department of Environment and Natural Resources
Bag Service #1 Inuvik, NT X0E 0T0**

Bear Encounter Response Guidelines
Oil and Gas Programs

I. PRINCIPLES:

1. Protection of Life and Property
2. Conservation

II. OPERATIONAL GUIDELINES:

- A. Deterrence
- B. Re-locate, if feasible
- C. Destroy

III. OPERATIONAL PROCEDURES:

Contacts:

Initial contact: Tim Devine, Manager of Wildlife & Fisheries (867)-777-7230 (W),
(867)-777-2077 (H)
(867) 678-0101 (Cell)

Response Personnel:

The following personnel can be available for responding to problem bear situations:

Ian Ellsworth	Inuvik	777-7308	777-1185 (Cell) 777-7236 (Fax)
	Inuvik	777-7201	
Ryan Smith	Inuvik	777-7247	
Vacant - Call	Tuktoyaktuk	777-7230	777-7321 (Fax)
Ian McLeod	Aklavik	978-2248	978-2756 (Fax)

Initial Contact:

1. The complainant should complete the attached checklist prior to calling DENR. It is critical that as much information as possible be provided at this point in order to determine the appropriate response.

IV. RESPONSE

Wildlife Monitors will be the initial responders to problem bears. It is imperative that they have a sufficient supply of approved deterrents at their disposal. All bear sightings and encounters shall be reported to the ENR office closest to the area of operation.

The potential responses will be considered in the following order:

a) Camps

1) Wildlife Monitors will employ conventional means of deterring problem bears which threaten public safety or property. This may involve chasing a bear out of the camp with a vehicle or snowmobile, or using noise makers and rubber bullets. If these methods prove ineffective, and where a helicopter is available or can be obtained in the area, the bear may be chased from camp. Pilots must be careful not to over stress the bear during this flight and must back off when the bear is a sufficient distance from the camp and keeps running in the desired location. If circumstances allow, a Renewable Resource Officer (RRO) should be contacted prior to using aircraft to deter bears. Undue harassment is illegal and must be avoided. **All incidents involving any means of deterrence should be reported to a Renewable Resource Officer as soon as possible.**

2) Should for some reason, the Wildlife Monitor be unable to deter a bear, and where the bear does not pose an immediate threat to public safety or property, the Department of Environment and Natural Resources (DENR) may send a deterrent or capture team to the site.

b) Denning bears

If a bear is located in, at or near a den site, work in the area must halt. All employees should safely retreat from the area and report the occurrence to the Site Supervisor, Wildlife Monitor, and the Renewable Resource Officer in your area as soon as possible. Staff from DENR will be required to assess the site and may implement measures to ensure bears are not unduly disturbed. This may include the establishment of an exclusion zone of 300 meters around the den in which no work will be permitted. Work inside the exclusion zone will remain stalled until after den emergence.

c) Free ranging bears

Prior to active deterrence of free ranging bears, and where public safety or property is not in immediate danger, the Wildlife monitor will assess the situation. The monitor should determine if the bear has been disturbed from a den or if it is denning in close proximity. Bears in the vicinity of a den should not be deterred and work should cease until DENR has assessed the site. If the Wildlife Monitor has determined that the bear is in fact free ranging, and not lingering around a den site, then active deterrence may commence.

d) Destruction of the bear

Instructions to destroy the bear will be given when deterrent actions have failed, when additional deterrent actions are not possible, and when it is determined that capture and relocation cannot be conducted or is unlikely to be successful.

The bear can be destroyed if human life or property is in immanent danger.

If a bear is killed, you will be required to:

- 1) Report the kill to DENR, as soon as possible.
- 2) Skin the bear, leaving the claws and penis (if applicable) attached, and preserve the hide by freezing or salting it and storing it in a cool place. Be generous with the salt.
- 3) Turn in the hide, the skull, and any other biological samples requested to a DENR Renewable Resource Officer.

As per the NWT Wildlife Act, no person may retain any part of a bear killed in defence of life or property.

V. FOLLOW-UP

After response measures are completed, the situation will be reviewed with the camp operator and corrective actions identified. These may include a wide array of actions aimed at avoiding future bear problems and ensuring that the operator is made aware of legal obligations. The need for conservation and the vulnerability of bear populations to over harvest is to be stressed.



Department of Environment and Natural Resources

Bag Service #1 Inuvik, NT X0E 0T0

FAX (867) 777-7236

Bear Complaint Checklist

1. Complainant Details:

Date/Time of Report: _____
Complainants Name: _____
Affiliation/Location of Complainant: _____
Contact Number for Complainant: _____
Other on Site Contacts: _____
Wildlife Monitors Name: _____

2. Camp Details:

Location of Complaint: _____
Latitude/Longitude: _____
Type of Camp- Permanent/ Mobile: _____
Number of People in Camp: _____
How Long has Camp Been Here (if Mobile): _____
Are there any Aircraft on site? If yes, Type: _____

3. History of the Problem:

Date/Time Bear First Sighted: _____
Type of Bear: Grizzly _____ Polar _____ Black _____
Sex of Bear: Male _____ Female _____ Unknown _____
Age of Bear: Cub _____ Juvenile _____ Adult _____
Has Bear Been Observed Before: _____
Den site found (description)? _____
What was the Bear Attracted To: _____
Did the Bear Obtain Food: _____
Behaviour of Bear: Fearful _____ Not Fearful _____ Aggressive _____
Damage By Bear: _____

4. Deterrent Action:

Was the Bear Deterred? Yes _____ No _____
If Yes, Type of Deterrent Used: _____
Present Status of Bear: _____

5. Other Information:

Reporters Name/Title: _____
Weather on Site at Time of Report: _____
Checklist Forwarded to: _____