6. TAKING ACTION

6. Taking Action

6.1 Before the Fact: Preventive Measures

The following actions illustrate the approach of Starfield Resources and Major Drilling to environmental care. In addition, they minimize the potential for spills during fuel handling, transfer or storage:

1. Fuel transfer hoses with camlock mechanisms are to be used.
2. Carefully monitor fuel content in the receiving vessel during transfer.
3. Clean up drips and minor spills immediately.
4. Regularly inspect drums, tanks and hoses for leaks or potential to leak.
5. Plastic Drip pans are to be used at all fuel transfer sites where fuel is transferred.
6. Blue absorbent matting is to be used under any stationary machinery (e.g., generator-sets and drill engines)
7. Train personnel, especially those who will be operators, in proper fuel-handling and spill response procedures.

6.2 After the Fact: Mitigative Measures

1. First steps to take when a spill occurs:
   a) Ensure your own safety and that of others around you, beginning with those nearest to the scene.
   b) Control danger to human life, if necessary.
   c) Identify the source of the spill.
   d) Notify the Project Manager-Project Geologist, as soon as is practical; he in turn notifies the Response coordinator (if a different individual).
   e) Assess whether or not the spill readily can be stopped.
   f) Contain or stop the spill at the source, if possible, by following these actions:
      i) If filling is in progress, STOP AT ONCE.
      ii) Close or shut off valves.
      iii) Place plastic sheeting at the foot of the tank or barrel to prevent seepage into the ground or runoff of fuel.
2. Secondary steps to take:
   a) Determine status of the spill event.
   b) If not reported under 1d), report incident and steps taken to the Project Manager and/or the Project Geologist

c) If necessary, pump fuel from a damaged and/or leaking tank or drum into a refuge container.

d) Notify the 24-hour Spill Report Line, and receive further instructions from the appropriate contact agencies listed in Appendix I (e.g., disposal of contaminated soil or ice/snow in sealed containers for removal from site, etc.).

e) Complete and FAX a copy of the Spill Report

f) Notify permitting authorities and the Lands Manager.

g) If possible, resume cleanup and containment.

6.3 Fuel Spills on Land

"Land" may be defined as soil, gravel, sand, rock and vegetation. Advice on spill containment and cleanup may be obtained from the 24-Hour Spill Line.

6.3.1 Procedure for Spills on Rock

For hydrocarbon spills on rock outcrops, boulder fields, etc

1. Response coordinator or his/her designate obtains plastic tarp(s) and absorbent sheeting on-site.
1. A berm of peat, native soil or snow is constructed down slope of the seepage or spill.
2. The tarp is placed in such a way that the fuel can pool for collection and removal (*i.e.*, at the foot of the berm). If there is a large volume of spilled product, pump the liquid into spare empty drums for sealing and disposal later off-site.
3. Absorbent matting is placed on the rock to soak up spilled oil, petrol, etc
4. Saturated matting is disposed of in an empty drum, which is then labelled and sealed. Alternatively, the matting may be wrung out into the empty drum(s).
5. The labeled and sealed drums are backhauled offsite by plane or helicopter to Thompson Manitoba where they are dealt with accordingly.
6. Depending on the nature and volume of the spill, the 24-Hour Spill Line may be contacted after Step 4 or after Step 5.

6.3.2 Procedure for Spills on Land

1. Response Co-coordinator or his/her designate obtains plastic tarp(s), absorbent matting, and any other necessary spill containment equipment, pump, hoses, etc.
2. A berm of peat, native soil or snow is constructed down slope of the seepage or spill.
3. The tarp is placed in such a way that the fuel can pool for collection and removal (e.g., at the foot of the berm). If there is a large volume of spilled product, pump the liquid into spare drums, and dispose of product by transporting to a solid-waste disposal facility.
4. Petroleum-product sheening on vegetation may be controlled by applying a thin dusting of Spagh-Zorb or other ultra-dry absorbent to the groundcover.

5. Contact the 24-Hour Spill Line. Receive instruction from the appropriate contact agencies listed in Appendix II regarding collection of the contaminated soil or vegetation, its removal and site cleanup/restoration.
6. Depending on the nature and volume of the spill, Response Co-coordinator or his/her designate implements the spill action plan.

6.4 Fuel Spills on Water

It is important to limit immediately the extent of spills. The following is the procedure to be implemented when an incident occurs:

1. If the spill is small, deploy hydrophobic (water repellent) absorbent pads (blue matting) on water. Hydrophobic pads readily absorb hydrocarbons. Alternatively, an ultra-dry absorbent designed for use on water-based spills may be deployed.
2. If the spill is larger, prepare several empty drums to act as refuge containers for the spill.
3. Deploy containment booms on the water surface to "fence in" the spill area gradually and to prevent it from spreading. Keep in mind that environmental factors such as high winds and wave action can adversely affect attempts at spill cleanup.
4. Absorbent booms then can be deployed to encircle and then absorb any hydrocarbon spillage that may have escaped the containment boom.
5. Once a boom has been secured, a skimmer may be brought on-scene to aid in capture of the hydrocarbon; once captured, the product should be pumped to the empty fuel drums and held for disposal.
6. As soon as possible either during or after the incident, contact the 24-Hour Spill Line. (This will ensure government agencies are informed).
7. If the spill is sufficiently large, and cannot be contained by rapid action of personnel present, contact the Mobile Environmental Response Unit for assistance. (Weather permitting, this unit can be flown to an emergency spill site within several hours.)

6.5 Fuel Spills on Snow and Ice

By its nature, snow is an absorbent, and fuel spilled on snow is collected with relative ease, e.g., by shovel, in the case of small-range spills.

6.5.1 Spills on Snow

1. Assess the nature of the spill. Necessary equipment might include shovels, plastic tarp(s), and empty drums.
2. Shovel or scrape contaminated snow and deposit in empty refuge drums. If the spill is more extensive, build peat-bale berms or compacted-snow berms with plastic over top, around the affected area.

3. Either during or immediately after the incident, notify the 24-Hour Spill Line. Receive instructions on the preferred disposal method (e.g., storage in sealed drums, transport off-site for disposal) from the appropriate contact agencies listed in Appendix I.

6.5.2 Spills on Ice

Before work or travel can occur on an ice surface, the ice has to be the required thickness according to safety standards (Table 6.1 and Table 6.2). For any work occurring on the ice; spills are handled in similar fashion as those on snow. However, as ice presents the potential danger of immediate access to water, care must be taken to respond quickly to such spills. Table 6.1 and Table 6.2 state the thickness. Should fuel seep or flow through cracks or breaks in the ice, despite all precautions, assistance should be sought immediately.

1. Construct a compacted-snow berm around the edge of the spill area.
2. Although hard ice will retard or prevent fuel entry to the receiving waters below, all contaminated snow and ice, as well as objects embedded in the ice (such as gravel) must be scraped from the ice surface and disposed of in an appropriate manner.
3. Contact the 24-Hour Spill Line. Receive disposal instructions (e.g., sealing in drums, transport off-site, etc.) from the appropriate contact agencies listed in Appendix I.
4. Where fuel or oil has escaped to the receiving waters, also contact the 24-hour emergency line of the Mobile Environmental Response Unit.

Table 6.1
Guide to Required Ice Thickness

	Weight	Ice Thickness
Ice Strength for Travel		
	242,500lb. (121t)	50 inches (127cm)
	154,000lb. (77t)	40 inches (102cm)
	100,000lb. (50t)	32 inches (81cm)
	55,000lb. (28t)	25 inches (64cm)
	22,000lb. (11t)	15 inches (38cm)
	17,600lb. (9t)	14 inches (36cm)
	7,700lb. (4t)	10 inches (25cm)
Ice Strength for Stationary Loads		
	242,500lb. (121t)	90 inches (229cm)
	154,000lb. (77t)	70 inches (178cm)
	100,000lb. (50t)	60 inches (152cm)
	55,000lb. (28t)	43 inches (109cm)
	22,000lb. (11t)	30 inches (76cm)
	17,600lb. (9t)	24 inches (61cm)
	7,700lb. (4t)	18 inches (46cm)

Expressed in inches and centimetres
Weights and ice thickness measures rounded to nearest whole

Table 6.2 below presents a numerical summary of the Transport Canada (1974) required fresh water ice thickness versus aircraft load from the AK-68-14-001 standard.

Table 6.2
Required Ice Thickness for Typical Aircraft Weights
AK-68-14-001 Transport Canada Standard

Weight – lb/kg	Weight - kN	Required Fresh-Water Ice Thickness (m/in)
10 000/4 545	44.5	0.33/13
30 000/13 640	133.5	0.58/23
67 000/30 400	300.0	0.90/35.5
135 000/61 360	600.0	1.27/50
800 000/364 000	3 570.0	3.20/126

(Source: Winter Operations Report 1995/96, Kennecott/Aber, Lac de Gras, by 669107 Alberta Ltd.)

6.6 Procedure for Chemical Spills

1. Assess the hazard of the spilled material. Members of the camp emergency-response team who might be susceptible in certain situations, (such as asthmatics, where fumes or airborne particles are evident), should be replaced with alternates.
2. Assemble the necessary safety equipment before response, (e.g., latex or other protective gloves, goggles or safety glasses, masks or breathers, etc.).
3. Apply absorbent matting to soak up liquids.
4. Place plastic sheeting over solid chemicals, such as dusts or powders, to prevent their disbursement by wind, or investigation by birds or other mammals.
5. Neutralize acids or caustics. Place spilled material and contaminated cleanup supplies in an empty refuge drum and seal for disposal.
6. Contact the 24-Hour Spill Line. Receive instructions on disposal methods and designated locations from the appropriate contact agencies listed in Appendix I.

7. GENERAL RESPONSE AND MAINTENANCE INFORMATION

7. General Response and Maintenance Information

7.1 General Equipment and Proximity

Equipment available to aid in spill response and remediation includes:

1. Spill Kits placed in appropriate areas around the camp (Figure 3.1). Table 7.1 documents the contents of the spill kits and table 5 documents the general response inventory available on site.
2. A helicopter can be dispatched to a drill site from the Ferguson Lake Lodge area within minutes.
3. Spill-response equipment is available from Rankin Inlet, 1.5 hours away by air, and or from Thompson, 4 hours away by air. Miscellaneous equipment at the Ferguson Lake Lodge area (Table 7.2) will also be made available for spill response and cleanup, including hand tools, shovels (earth and snow), fire extinguishers, fuel transfer pumps, water pumps, miscellaneous hoses and fittings.
4. Personal including first aid attendant and clean up crews are available for immediate dispatch from the Ferguson Lake Lodge camp site.

Table 7.1
Contents of Spill Kits – 2005
Drillsite-Campsite – Ferguson Lake

Drill Shack – Spill Kit Drums – 2

A FRIEND TO THE ENVIRONMENT

M.E.P. ENVIRONMENTAL PRODUCTS LTD.

68 PARAMOUNT ROAD
WINNIPEG MANITOBA R2X 2W3
Phone 204-632-4118
Fax 204-632-5809

SK-Maps\Midwest Drilling.wpd

Emergency After Hours call 204-946-2064

MAJOR MIDWEST DRILLING
MM-204-50 GAL
OIL SELECT SPILL KIT

CONTENTS:

1 **02U0526, Come in a 55 Gal. Poly DOT, approved open head drum with quick lock ring.**

2 **12WOSB510SN, Hydrocarbon select containment boom 5" x 10' ea .**

1 **WE150SM, Roll hydrocarbon select adsorbant blanket 19" x 144' x 3/8".**

1 **Set of instructions.**

1 **List of Contents.**

SPILL INSTRUCTIONS AND PROCEDURES

- EMPTY OUT DRUM
- ENCIRCLE SPILL AREA WITH BOOM.

  RIP ROLL INTO PIECE SIZE AS NEEDED AND TOSS INTO CENTER OF BOOM TO ADSORB FLUID, RETRIEVE WHEN SATURATED AND PLACE IN DRUM. REPEAT IF NECESSARY.
- REMOVE BOOM AND PLACE IN DRUM.
- CONTACT YOUR ENVIRONMENTAL OR SAFETY OFFICER FOR CORRECT DISPOSAL PROCEDURE.

WITHOUT PREJUDICE NO LIABILITY

(continued)

Table 7.1
Contents of Spill Kits – 2005
Drillsite-Campsite – Ferguson Lake (completed)

Fuel Storage Area – Transfer Stations – Movable Spill Kits - 6

ATTN: JOHN NICHOLSON

A FRIEND TO THE ENVIRONMENT

M.E.P. ENVIRONMENTAL PRODUCTS LTD.

68 PARAMOUNT ROAD
WINNIPEG MANITOBA R2X 2W3
Phone 204-632-4118
Fax 204-632-5809

SK-MAJor Mid-east 30S.wpd

Emergency After Hours call 204-946-2054

MAJOR DRILLING GROUP 30S
OIL SELECT
SPILL KIT

1	02U0510, 30 GAL POLY DOT APPROVED CONTAINER WITH QUICKLOK RING.
1	WB510SN, OIL SELECT WHITE ADSORBANT BOOM 5" X 10'.
1	SP19, OIL SELECT WHITE SPLIT ROLL 3/8" X 19" X 144'.
10	12SWP100H, OIL SELECT ADSORBENT PADS 17" X 19" X 3/8".
2	02TB3648L, DISPOSAL BAGS WITH TIES.
1	SET OF SPILL PROCEDURES AND INSTRUCTIONS.
1	LIST OF CONTENTS.

SPILL PROCEDURE & INSTRUCTIONS

- Encircle spill with adsorbent boom.
- Toss adsorbent pads onto spill.
- Retrieve pads, wring out into disposal bag and re-use if necessary.
- Place contaminated pads in disposal bag when done with them.
- Remove boom from around spill and place in disposal bag.
- Call your environmental officer for disposal instructions.

(WITHOUT PREJUDICE)
(NO LIABILITY)

Table 7.2
General Response Inventory – Ferguson Lake Camp – 2005

- Fire extinguishers (valid/recharged) in each structure.
- Water pump and spare at drill shack; Ferguson Lake Lodge, hoses and fittings
- Hammers, assorted sizes, at Ferguson Lake Lodge and at drill shack
- Shovels and picks assorted sizes, at Ferguson Lake Lodge-Ski-doo shop.
- Assorted 10L plastic pails, at Ferguson Lake Lodge-Ski-doo Shop and at Helicopter operations shed.
- Ice auger (gas-powered) c/w extensions, at Ferguson Lake Lodge-Ski-doo shop.
- Plastic garbage bags (boxes of 100 each)-Ferguson Lake Lodge-Camp Muster Station
- Plastic tarps – assorted sizes-Ferguson Lake Lodge-Ski doo shop
- Extra bundles of absorbents, at Ferguson Lake Lodge Ski-doo shop and Major Shop
- Fuel-transfer pumps at Ferguson Lake Lodge, Ferguson Lake Airstrip and at each drill shack.

8. RESPONDING TO FAILURES AND SPILLS

8. Responding to Failures and Spills

8.1 Spill Response

Following is a list of personnel trained to respond to spill incidents, and their respective responsibilities:

John Nicholson
Project Manager – 2005

Ferguson Lake Worksite and Camp	
MSAT Telephone	(600) 700-7673
Globalstar Telephone	(403) 987-0869
SRU phone	(604) 515-0398 (camp)
SRU fax	(604) 515-4862 (camp)

Responsibilities:

- Assume authority over the spill scene and personnel involved.
- Activate the Contingency Plan.
- Report, or direct Response Co-coordinator (if a different individual) to report, the spill to the NWT 24-Hour Spill Report Line (867) 920-8130.

Brian Game (when on site)
(Alternate) Project Manager – 2005

Ferguson Lake Worksite - latitude 62° 51' 30" and longitude 96° 55' 00" (Zone 14)	
MSAT Telephone	(600) 700-7673
Globalstar Telephone	(403) 987-0869
SRU phone	(604) 515-0398 (camp)
SRU fax	(604) 515-4862 (camp)

Responsibility:

- Perform response duties of Project Manager, in his absence.

Harold Hewlin/Doug Owens
Major Drill Foreman – 2005

Major phone	(604) 520-3496 (camp)
Major fax	(604) 520-3496 (camp)

Responsibilities:

- Drill Foreman may assume authority over the spill scene and personnel involved.

RESCAN Environmental Services Ltd.
Environmental Advisers

RES phone	(604) 689-9460 (Vancouver)
RES fax	(604) 687-4277 (Vancouver)
Contact	Latisha Heilman/François Landry

Responsibilities:

- Adviser provides expert advice on environmental/logistical cleanup requirements.
- Each/both may provide assistance in developing any required testing or monitoring program, or in activating an existing program. Each/both may recommend preventive measures.

APPENDIX 1 – CONTACT LIST

Appendix I – Contact List

Contact Telephone Numbers:

Emergency Spill Hotline	(867)920-8130 (ph) (867)873-6924 (fax)
DIAND Water Resources Inspector (Notify inspector if a spill is reported to the emergency spill hotline)	(867)975-4298 (ph)
Starfield Resources	
Vancouver Office:	(604)608-0400 (ph) (604)608-0344 (fax)
Ferguson Camp	(604)515-0398 (ph) (604)515-4862 (fax)
Rankin Inlet Office	(867)645-4252 (ph)
Major Drilling	
Flin Flon Office	(204)687-3483 (ph) (204)687-5739 (fax)
Workers Compensation Board	(867)669-4409 (ph) (867)873-0262 (fax)
John Nicholson	(604)786-9095 (ph)
Brian Game	(604)671-2646 (ph)
RCMP (Rankin Inlet)	(867)645-1111 (ph)
Kivalliq Inuit Association (Rankin Inlet)	(867)645-2810 (ph) (867)645-3855 (fax)
INAC Resource Management-Kivalliq	(867)645-2831 (ph)
Ministry of Environment (Rankin Inlet)	(867)645-8083 (ph) (867)645-8085 (fax)
Environment Canada	
Iqaluit	(867)-975-4464(ph)
Environment protection 24 hour pager	(867)920-5131(pager)
Department of Fisheries and Oceans	(867)645-2871 (ph)

Nunavut Impact Review Board	(867)983-2593 (ph)
Nunavut Water Board	(867)360-6338 (ph) (867)360-6369 (fax)
Rescan Environmental Services Ltd.	(604)689-9460 (ph) (604)687-4277 (fax)

Contact List – Spill Response / Assistance

Ken Borek Air (Rankin Inlet)	(867)645-2535 (ph)
Missinnippi Air (Thompson)	(204)679-1370 (ph)
M&T Enterprises (Rankin Inlet)	(867)645-2778 (ph) (867)645-2058 (ph)
Baker Lake Contractors (BLCS)	(867)793-2831 (ph) (867)793-2577 (fax)

APPENDIX II – MATERIAL SAFETY DATA SHEETS (MSDS)

Appendix II – Material Safety Data Sheets (MSDS)

(See MSDS on attached CD)

Material Safety Data Sheets
Starfield Resources Ferguson Lake Camp
(see MSDS Sheets on accompanying CD)

- Bounce
- Cascade
- Cheer
- Clorox
- Comet with Bleach
- Comet Cleaner with Clorinoll
- Oven Cleaner
- Light Distillate
- Middle Distillate
- Gas Unleaded
- Heating Oil (P-50)
- Kerosene Oil
- Lysol Disinfectant Spray
- Markel Sharpie
- Moth Balls
- Propane (odorized)
- Oxygen
- Spic and Span floor cleaner with bleach
- Spic and Span Glass Cleaner
- Spic and Span heavy duty degreaser
- Spray Paint
- Liquid Tide with Bleach
- Windex Glass Cleaner

Major Drilling Ferguson Lake Project
(see MSDS Sheets on accompanying CD)

- Deep Woods Off
- Dexron
- Dexron III Mercon
- Diesel Fuel – ESSO
- EZ-MUD
- Gasoline
- Hydraul 50
- Hydraul 56
- Hydrex 100
- Marvel lube WR2
- Mobil Synthetic
- Moly 2
- Moly Grease
- Poly Drill 133-x
- Poly Drill 1300
- Calcium Chloride Flake
- Lafarge FONDU
- Gas Line Antifreeze
- Laundry Detergent
- Poly Drill OBX
- WD-40
- Petro Canada Antifreeze
- Petro Canada Chain Oil
- Petro Canada Dexron III
- Petro Canada Diesel Fuel
- Petro Canada Gas Line Antifreeze
- Petro Canada Gasoline
- Petro Canada Gear Oil
- Petro Canada Hydraulic Oil
- Petro Canada Jet-B
- Petro Canada Oil
- Petro Canada Rod Grease
- Petro Canada Snowmobile Oil
- Univis N-22