

Shell Canada Limited



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P.O. Box 100, Station M
Calgary, Alberta T2P 2H5
TEL (403) 691-3111

January 19, 2006

Executive Assistant
Northwest Territories Water Board
P.O. Box 1500
YELLOWKNIFE, NT
X1A 2R3

COPY	
BOARD	6
G. W.	1
E. A.	1
W. RES.	0/2/6
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FILE	1762

**SUBJECT: WATER LICENSE N7L1-1762 CAMP FAREWELL
UPDATED O&M PLAN AND EMERGENCY RESPONSE PLAN**

Please find attached, as per the subject License, the updated Operations and Maintenance Plan as well as the updated Emergency Response Plan. The Emergency Response Plan can be found under Tab 7 of the manual. The recommendations made during the Information Request phase of the Application process have been incorporated.

If additional information is required, please feel free to contact Mr. Randy Hetman Ph:(403) 969-0730, Fax:(403)269-7948 Email:randy.hetman@shell.com or myself as indicated below.

Yours truly

Randall Warren
DAR/Construction Manager
Ph: (403) 691-2521
Fax: (403) 269-7948
Email: (403) randall.warren@shell.com

cc: Inspector - Water Resources, INAC
Randy Hetman, Shell Canada Limited



Camp Farewell Operational Plan Summary

Start Up

- The Water License defines the regulatory requirement for the use of water and discharge of effluents. Maintain a copy of the License at the site at all times.
- Site manager will review Water License N7L1-1762 and "Water License Field Requirement Checklist" and ensure requirements are executed.
- Start up treatment plant as per manufacturer Start Up Procedures.
- The sewage lagoon at Camp Farewell will be used to store the effluent generated by the sewage treatment plant during the conditioning period of the extended aeration activated sludge unit.

Modifications

- The Board must be notified 45 days prior to beginning modifications.
- As-builts must be submitted to Water Board within 90 days of completion of upgrade.

Operating

- Inspector shall be notified 5 days before the start of any planned discharge.
- Inspector approval is required before discharge to the Mackenzie River. Four samples that average within the water license discharge criteria are required in order to receive approval from the Inspector. See "Water License MAC Calculations" in Water License Section 8.
- When discharging continuously from the extended aeration plant, directly to the river, samples and analyses are required every two weeks as per the "QA/QC Plan for Collecting Representative Water Samples".
- Maintain sewage treatment plant as per the Sanitherm operation and maintenance manual.
- Monitor sediments in tanks and remove with vacuum truck as required and transport to the municipal sewage lagoon.
- Maintain sign identifying the sampling station of the "Surveillance Network Program.
- In the event of a spill, it is to be handled as per Spill Contingency Plan.
- Spill reporting procedures include GNWT Spill Reporting, within 24 hours of an occurrence.
- Ensure water truck has a screen on the suction hose that is compliant with the water license.
- Maintain a record of water withdrawn from the Mackenzie River. Utilize daily "Water Withdrawal Volumes" form for tracking use.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

- Maintain a record of water discharged to the Mackenzie River. Utilize daily "Waste Water Disposal Volumes" form for tracking use.
- Submit Monthly "Water License Field Requirement Checklist", "Water Withdrawal Volumes" and "Waste Water Disposal Volumes" sheets as indicated on form.

Shut Down

- Shut down sewage treatment plant and facilities as per manufacturer procedures.
- Haul remaining effluent and sludge with vacuum truck to municipal sewage lagoon for disposal.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Water License On-Site Requirements

Check List

	Circle appropriate answer	Date	Initials
Copy on site: Operations & Maintenance Plan	Yes / No		
Water License*	Yes / No		
Current ERP/Contingency Plan*	Yes / No		
QA/QC Plan*	Yes / No		
*Located in O&M Plan Binder			
Inspector Approval prior to Discharge	Yes / No		
Screened Water Intake (1/10" mesh)	Yes / No		
Discharge Sample Point Sign in place w/ "1762-1 Treated Effluent Discharge Sample Point"	Yes / No		
Volumes of Water withdrawn and waste discharged (for the camp) are recorded	Yes / No		
Treatment Facilities were modified.	Yes / No		
If yes:			
5 Day Notice to Inspector	Yes / No		
As-builts submitted within 90 days of completion	Yes / No		
When taking water from the lake, dissolved oxygen & temperature profile must be obtained prior to withdrawal and prior to demob.	Yes / No		
	Yes / No		

Biweekly Discharge Samples

	Date Sampled	Sampler		Date Sampled	Sampler
1			14		
2			15		
3			16		
4			17		
5			18		
6			19		
7			20		
8			21		
9			22		
10			23		
11			24		
12			25		
13			26		

Fax to Shell Canada Limited, DAR/Construction Manager on the first of every month. Fax: (403) 269-7948

CAMP FAREWELL OPERATIONS MAINTENANCE PLAN

Year: _____

Water Withdrawal Volumes Camp Farewell

Water License On-Site Requirements

Number of cubic meters for Camp Farewell Use Only Permit#N7L1-1762

Truck Volume: _____ m3 per load.

Date	January	February	March	April	May	June	July	August	September	October	November	December
1												
2												
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4												
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29												
30												
31												
Total Loads												
Total M3												

Note: Maximum Licensed Volume = 150 m3/d

Fax to: Shell Canada Limited, DAR/Construction Manager on the first of every month @ (403) 269-7948

CAMP FAREWELL OPERATIONS MAINTENANCE PLAN

Camp Farewell

Year: _____

Waste Water Disposal Volumes

Water License Field Requirements

For Reporting Requirements, only Monthly Volume Required.
Daily Tracking is only for Operational Monitoring

Date	January	February	March	April	May	June	July	August	September	October	November	December
1												
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Total M3												

Fax to: Shell Canada Limited, DAR/Construction Manager on the first of every month @ (403) 269-7948

CAMP FAREWELL OPERATIONS MAINTENANCE PLAN

Camp Farewell

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31												
Total M3												

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CAMP FAREWELL OPERATIONS MAINTENANCE PLAN

Year: _____

Water Withdrawal Volumes Camp Farewell

Water License On-Site Requirements

Number of cubic meters for Camp Farewell Use Only Permit#N7L1-1762

Truck Volume: _____ m3 per load.

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31												
Total Loads												
Total M3												

Note: Maximum Licensed Volume = 150 m3/d

Fax to: Shell Canada Limited, DAR/Construction Manager on the first of every month @ (403) 269-7948

Water Withdrawal.xls

11/26/2001

Extended Aeration Activated Sludge Unit

Waste Water Treatment System

General Description

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Wastewater Treatment Facility – 30 to 120 Camp Residents

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CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Wastewater Treatment Facility – 30 to 120 Camp Residents

The Extended Aeration Activated Sludge Process

Aerobic digestion of organic based contaminants is employed as the main treatment process within the treatment plant. Sludge settling, recycling of sludge and final effluent disinfection complete the treatment process operations.

In aerobic digestion, microorganisms use the dissolved and suspended organic matter in sewage as food. They also eat dead microorganisms. In addition to food, the microorganisms need oxygen. The oxygen is added in aeration tanks where air is bubbled through the water, organic matter and microorganisms to provide oxygen to the microorganisms and to ensure that the microorganisms contact the organic material. In the extended aeration activated sludge process, the microorganisms eat each other as well as sewage. This cannibalism results in a biologically inert sludge with very few microorganisms in it. This is achieved by a retention time in the aeration tanks of 24 hours and having more microorganisms than necessary to eat the sewage. The products of the aeration tanks are water, carbon dioxide, more microorganisms and a biologically inert residue.

The mixture of treated water and microorganisms is settled out in settling tanks (called clarifiers). The settled out alive and active microorganisms (called activated sludge) are returned to the aeration tanks. As there are more microorganisms in the activated sludge than needed to eat the incoming sewage, some of the microorganisms along with the inert sludge are wasted.

With the microorganisms settled out, clean and clear water flows out over the top of the settling tanks. Passing it through banks of ultraviolet lights disinfects this water. After disinfection, the water is discharged to the Mackenzie River.

The treatment plant is contained within two 39' 5" long by 7' 8 1/2" wide by 8- 9 1/2" high containers. The two containers are located parallel to one another and are connected by pipes and electrical cables. One container contains a flow equalization chamber, four settling tanks, a sludge holding tank, a chlorine contact chamber, two banks of ultraviolet disinfection lights, pumps, air blowers electrical panels and instrumentation controls. The second container has aeration tanks. Power to operate the plants pumps, heating and control system is supplied by the camp generating facility

The flow of sewage through the treatment facility is as follows:

The camp wastewater outfall line discharges to a lift station placed below grade to accept this flow under gravity. The lift station is equipped with a level activated submersible lifting and grinding pump, which pumps the sewage to the sewage treatment plant.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Wastewater Treatment Facility – 30 to 120 Camp Residents

The pumped sewage flows into a flow equalization chamber. This chamber smoothes out the peaks and valleys of sewage flow to the aeration tanks. It has a minimal amount of air bubbling through it to prevent it from becoming septic and very smelly. Overflow from the sludge holding tank and some wasted activated sludge are also pumped into this chamber. Grinder pumps pump sewage from the bottom of this tank to the aeration tanks.

In the aeration tanks the sewage from the flow equalization chamber has activated sludge (live microorganisms) added. Air is blown through this to add oxygen and mix the sewage and microorganisms into a uniform mixture. Retention time in this unit is around 24 hours. As sewage is pumped in at one end of an aeration tank, a mixture of water, inert sludge and microorganisms flows out the other end to the settling tanks.

After about four hours of settling the clear, treated discharge water runs over a weir to a holding tank. The settled sludge containing microorganisms is then pumped using airlifts to the aeration tanks. This is the 2" PVC RAS (Returning Activated Sludge) line shown on the Sanitherm P&ID drawing. Two valves allow some of this sludge to be wasted to either the sludge holding tank or the flow equalization chamber. These are the WAS (Waste Activated Sludge) lines shown on the Sanitherm P&ID drawing. Any inert material will be recycled through the system until it eventually ends up in the sludge holding tank where it stays.

Whilst the holding tank could be used as a chlorine contact chamber, it is not planned that chlorine be added to the water for disinfection. After flowing through the holding tank, the water enters into two banks of Ultraviolet lights for disinfection. Then the water leaves the building through a 2" male cam lock connection. If the discharged water does not meet quality specifications it can be diverted to the lagoon located immediately beside the plant for processing at a later time.

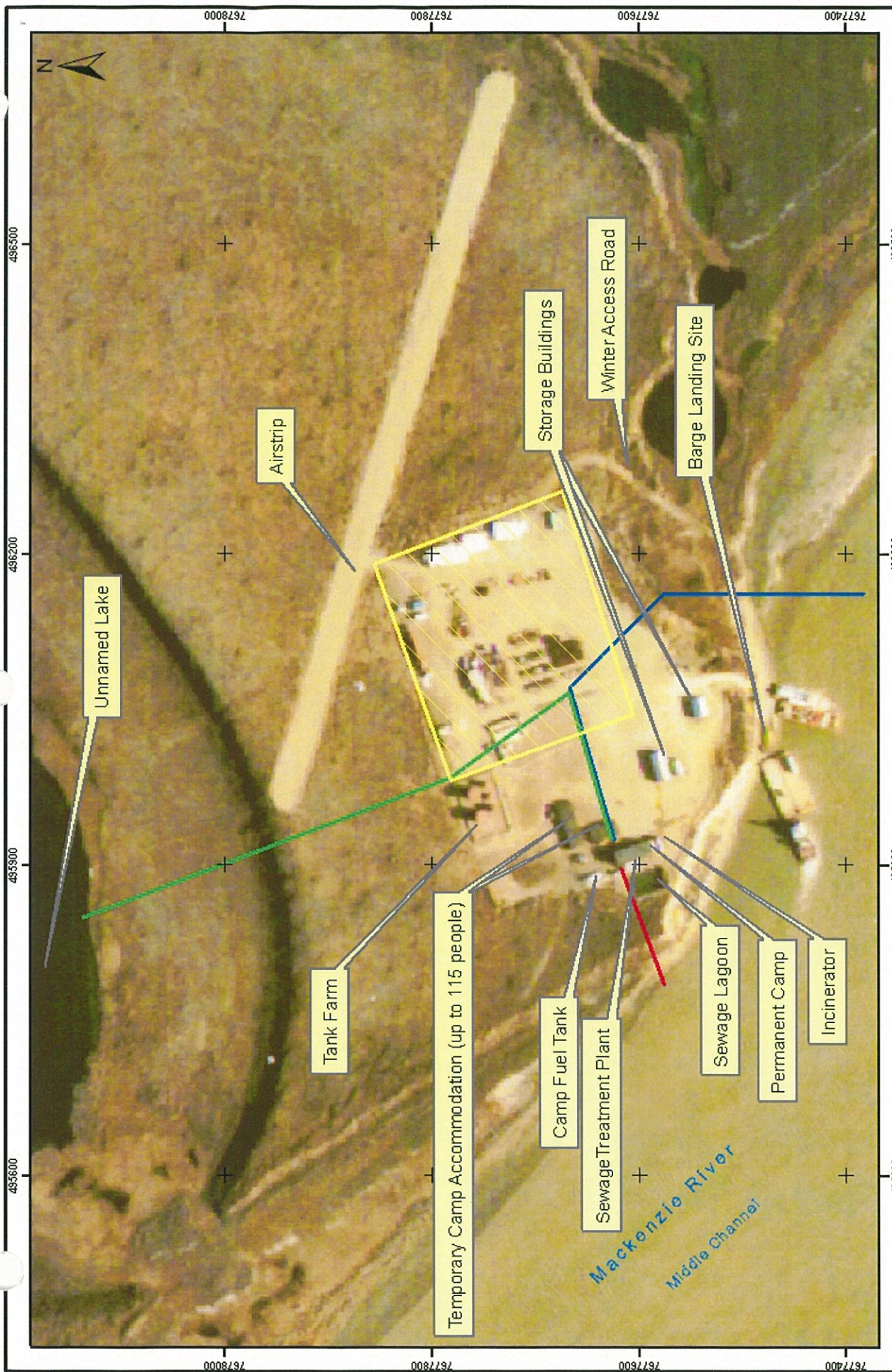
The discharge line is heated to prevent freezing. Sufficient discharge hose, dependent on yearly water levels will transport the treated water to a discharge point in the Mackenzie River channel directly adjacent to Camp Farewell. The discharged water flows from the pipe directly into the moving water, through a hole in the ice.

Float switches control the pumps that pump from the flow equalization tank to the aeration tanks. A timer in the control panel controls the aeration blowers. There are two flow equalization pumps and two aeration pumps so that there is 100% stand-by. These blowers provide air for the aeration, flow equalization and holding tanks and for the airlift pumps installed in the settling tanks. The airlift pumps have no other controls on them. They are on when the blowers are on and off when the blowers are off.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Wastewater Treatment Facility – 30 to 120 Camp Residents

Samples of discharged water are taken after the disinfection point. This sample point is easily accessible for collection in a safe and hygienic manner. A small PVC bucket is used to collect approximately 2 liters of sample. The sample is then decanted into three separate sample bottles provided by a third party lab. Samples are shipped directly to the lab for analysis of pH, BOD, TSS, fecal coliform counts, oil and grease and free chlorine concentration. Samples are collected every two weeks during periods of discharge. An insulated cooler with ice packs is used to transport the samples to the lab, preventing them from warming and maintaining a constant sample temperature. Some of the analysis must be conducted within 24hrs of sampling, therefore sampling and expediting planning is of utmost importance. For full details on sampling and analysis, refer to License N7L1-1762 and the approved QA/QC Program.



Legend

- Approximate Location of Unnamed Lake Water Intake
- Approximate Location of Mackenzie River Water Intake
- Approximate Location Wastewater Discharge
- Stockpile Site

CAMP FAREWELL SITE PLAN

PROJECT UTM 6	DRAWN N4 D 63	CONTRACTOR NAME IES ENVIRONMENTAL	DATE JUNE 15, 2005
SCALE PP-6	CHECK 1/IN	SCALE 1:5,000	DATE JUNE 15, 2005

Geomatics & Environmental Systems Inc. 25.09.2002

FIGURE 5-1

SHELL CANADA LIMITED

PLAN SHOWING SURVEY

OF

Farewell Stock Pile Site & Access Road

CO-ORDINATES OF S.W. CORNER OF SITE
LATITUDE 69° 12' 30.0" LONGITUDE 135° 06' 04.4"

SCALE 1" = 600

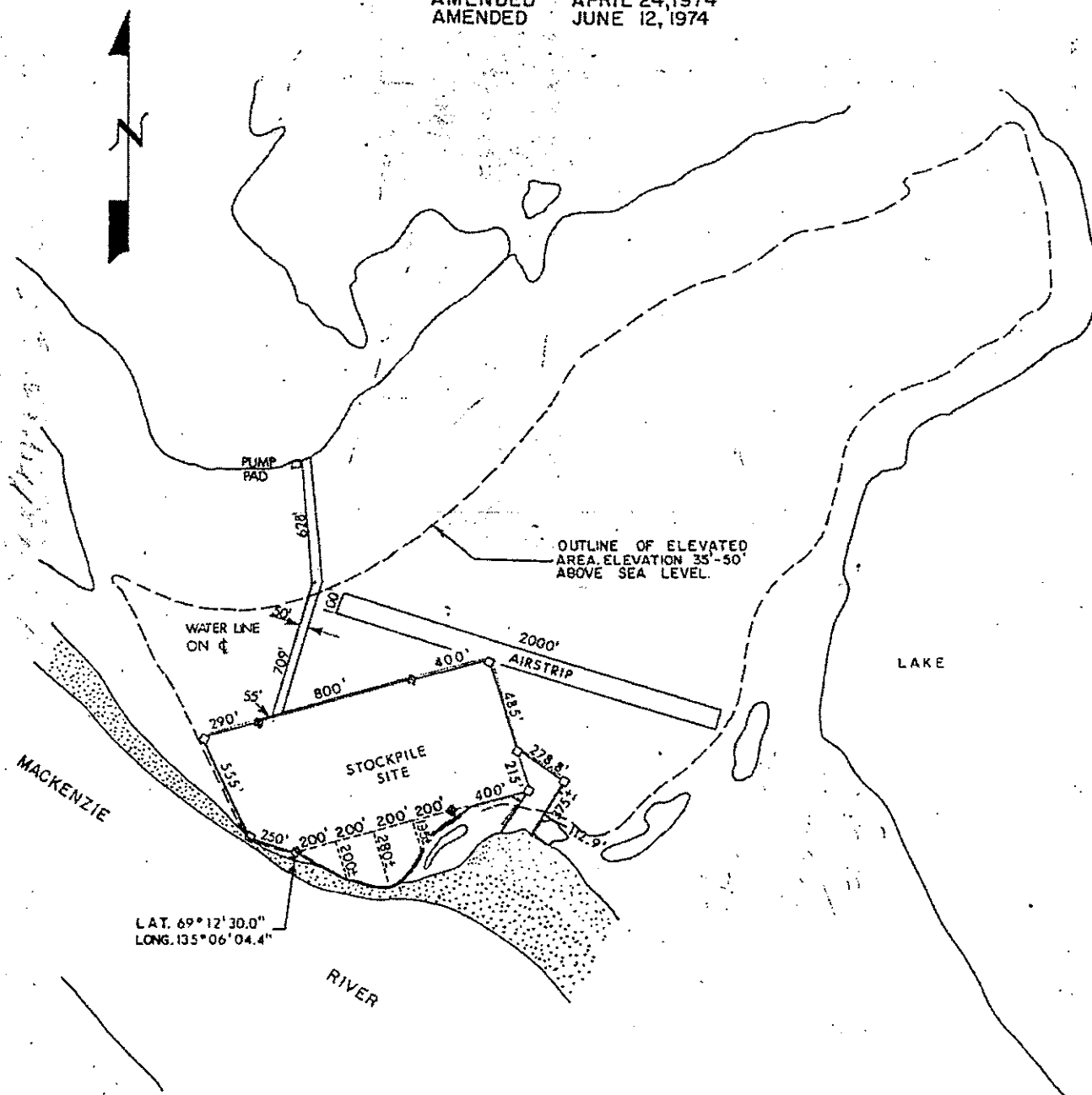
DECEMBER 1971

AMENDED FEBRUARY 1972

AMENDED APRIL 9, 1973

AMENDED APRIL 24, 1974

AMENDED JUNE 12, 1974

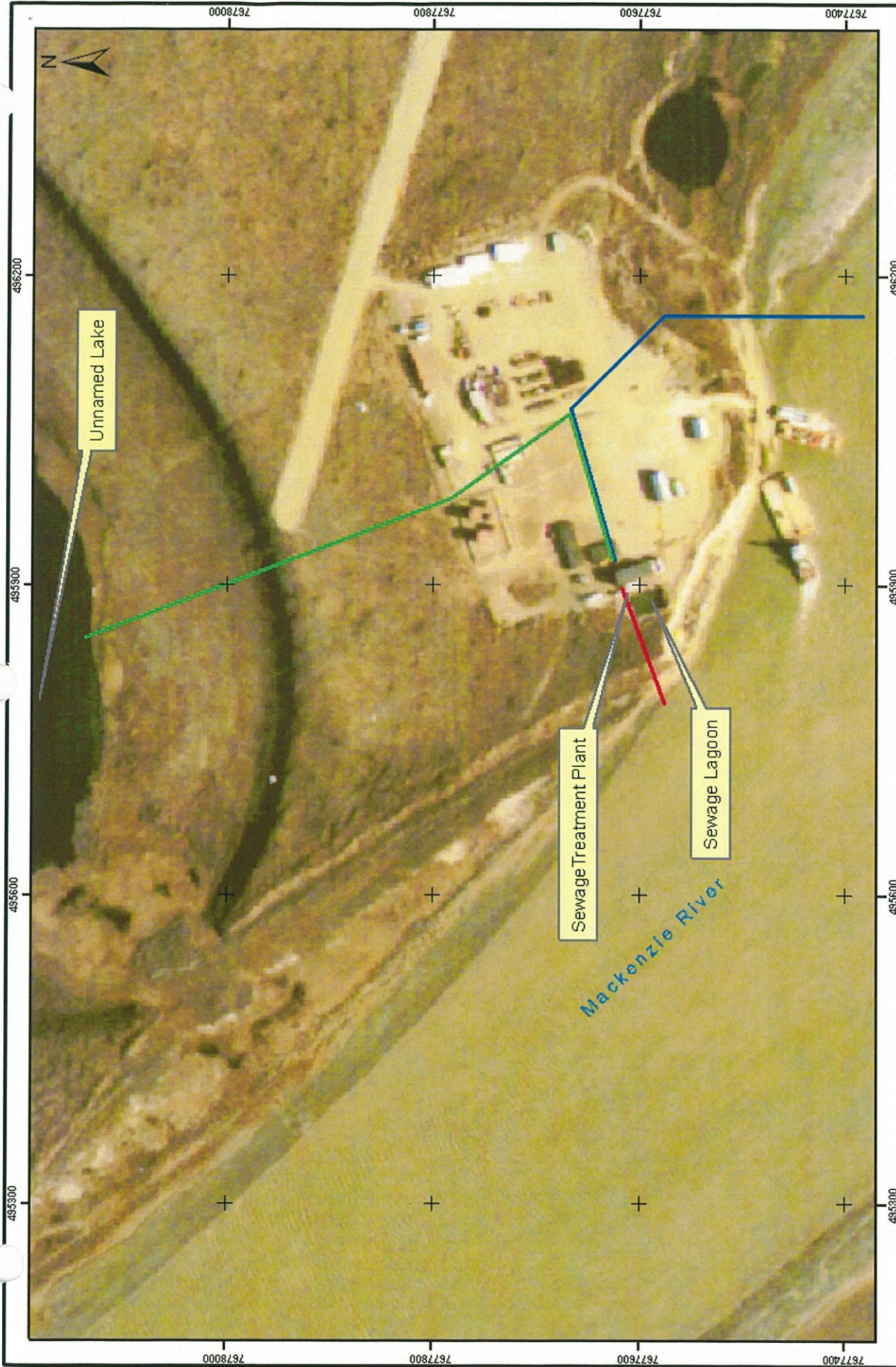


LEGEND

5/8 x 18" Iron Bars Planted Shown Thus
Sand and Gravel on River Bank
Elevation of S.W. Corner 45±
Area Stockpile Site = 27.00 Acres
Area Airstrip = 4.59 Acres
Area Water Line = 1.53 Acres
Total = 33.12 Acres

I certify that the survey represented by this plan is correct to the best of my knowledge and was completed on the 16th day of December 1971. Revised as shown.

A. Hittel
A. HITTEL D.L.S. April 9th 1973



Legend

- Approximate Location of Unnamed Lake Water Intake
- Approximate Location of Mackenzie River Water Intake
- Approximate Wastewater Discharge Location

Scale

0 40 80 160 240 320 Meters

Map Information

PROJECT: UTM 8

DATE: JUNE 15, 2005

SCALE: 1:5,000

CONTRACTOR: IBC ENVIRONMENTAL

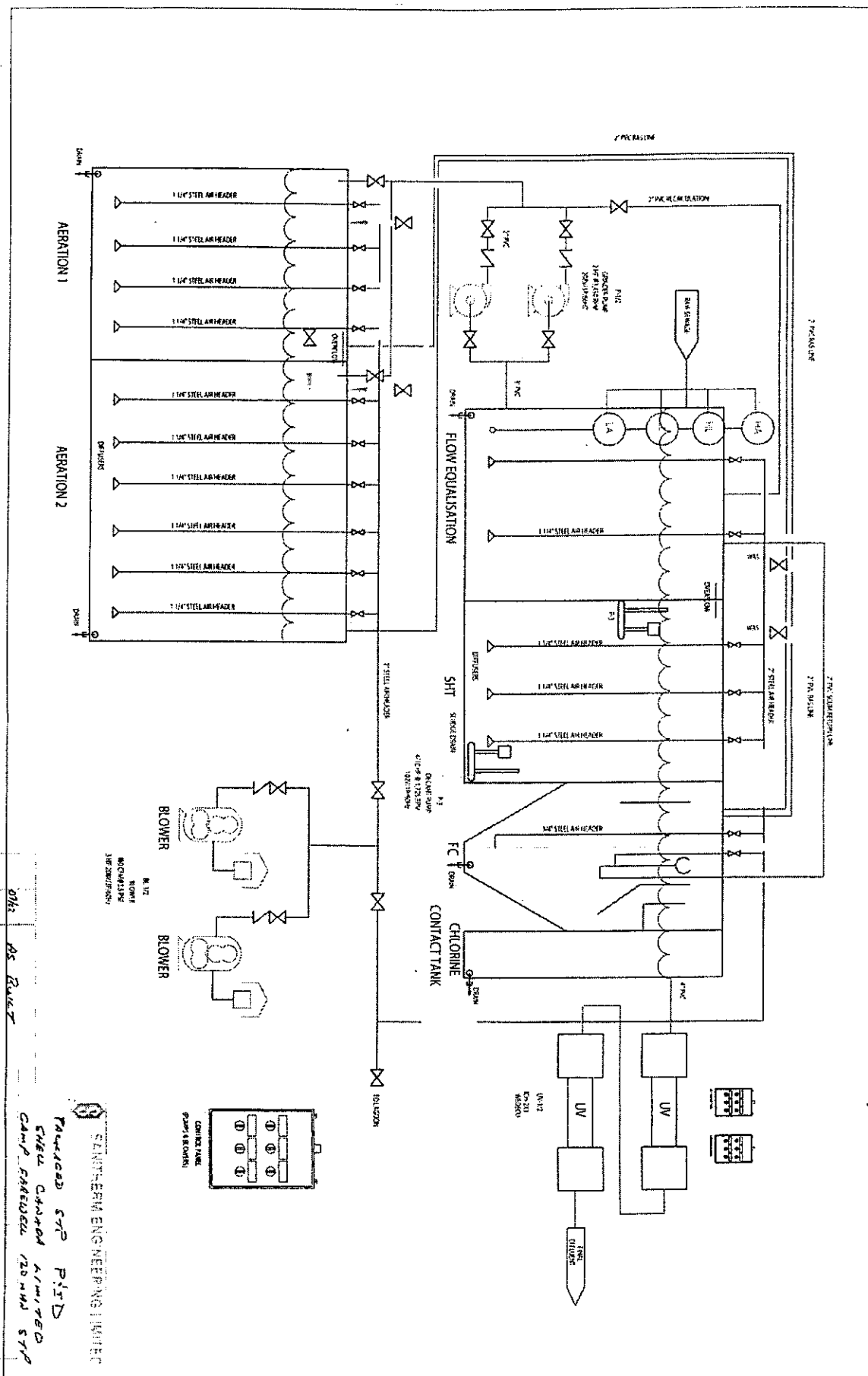
PROJECT NAME: Camp Farewell Water Source, Treatment and Discharge Locations

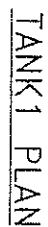
Notes

Geographic Information System (GIS) Data: 25.09.2002

MAP FILE NAME: FIGURE A


REV: 0

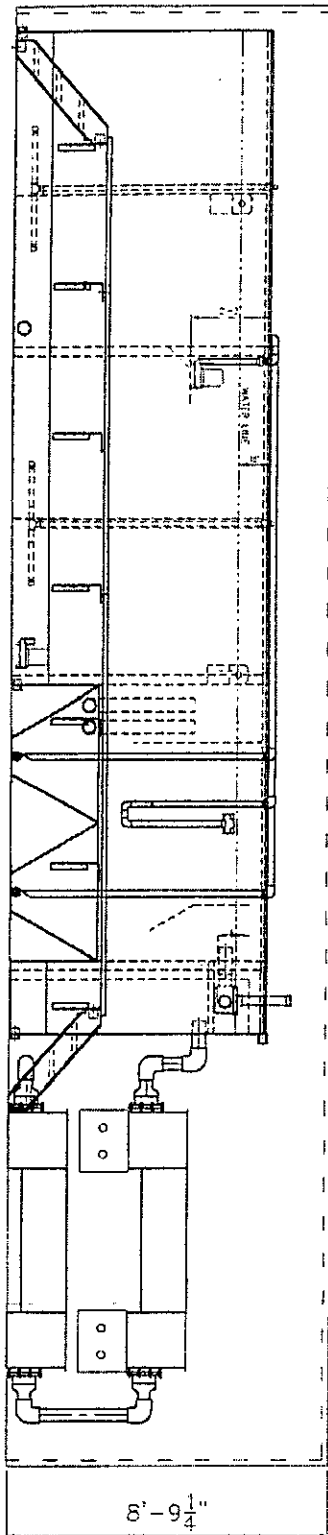




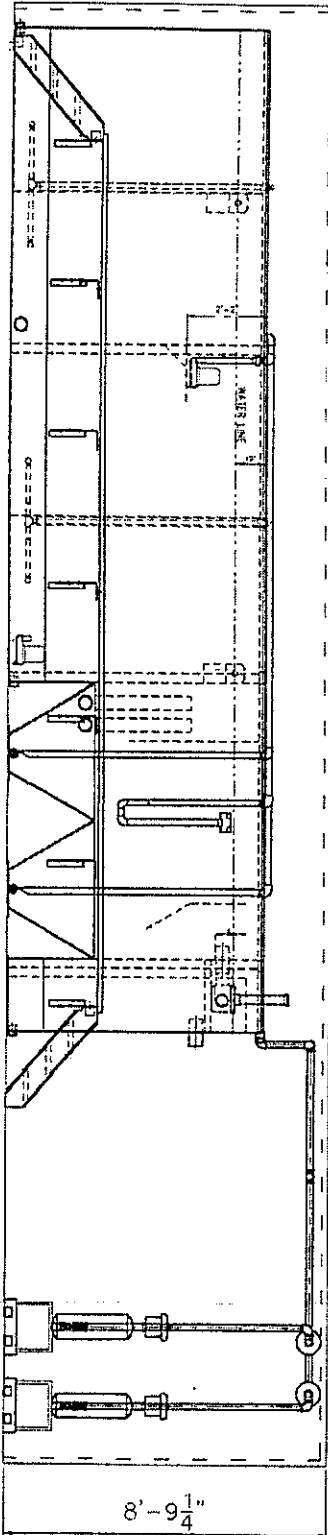
TANK2 PLAN



 SOUTHERN ENGINEERING LIMITED 101 - 10000 100th Ave. N.E. - 10000 Industrial Park - Burnaby, B.C. V5A 4G6 Tel: (604) 291-8888 Fax: (604) 291-8889	
PACKAGE SERVICE TREATMENT PLANT GA TITLE	
PROJECT	
BRIEF	
CLIENT CANADA LTD.	
LOCATION CHAM FAIRWELL 120 MAIN ST.	
DATE	SCALE
BY	DATE
CHKD	DATE
APPROVED	DATE

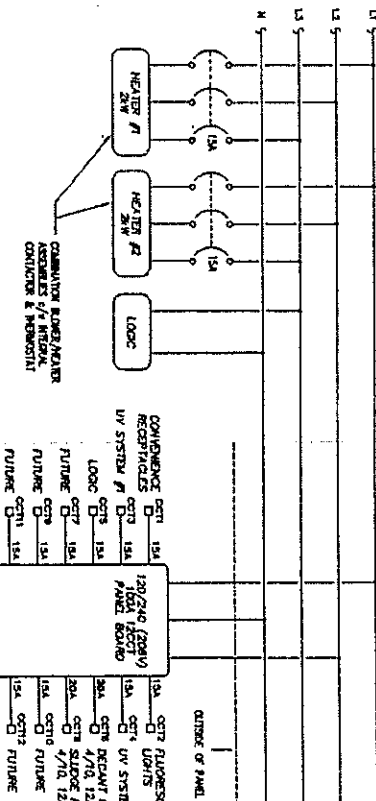
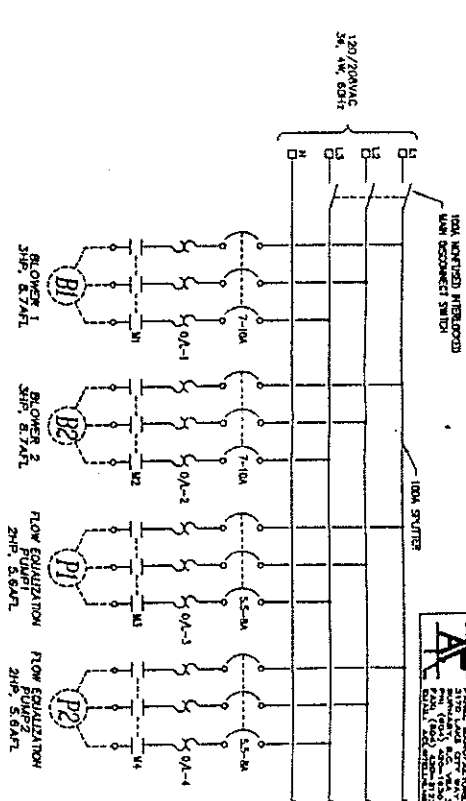


SECTION A
NTS



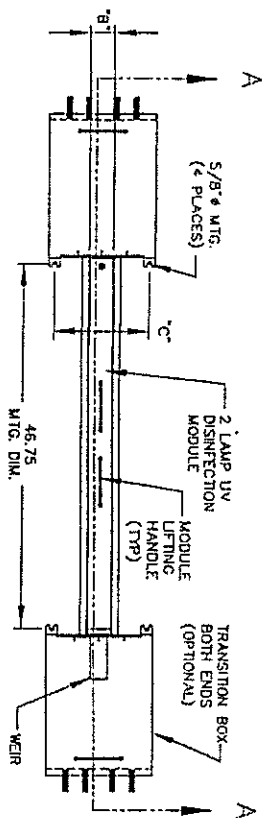
SECTION B
NTS

SANTHERM ENGINEERING LIMITED 1000 Highway 100, Unit 1, North York, Ont. M2H 3P2 Tel: (416) 491-1111 Fax: (416) 491-1112	
PROJECT	CAMP FAREWELL 100 MAN B/P
CLIENT	SHELL CANADA LTD
DATE	1998-08-17
BY	1000 Highway 100, Unit 1, North York, Ont. M2H 3P2
CHECKED	1000 Highway 100, Unit 1, North York, Ont. M2H 3P2
APPROVED	1000 Highway 100, Unit 1, North York, Ont. M2H 3P2

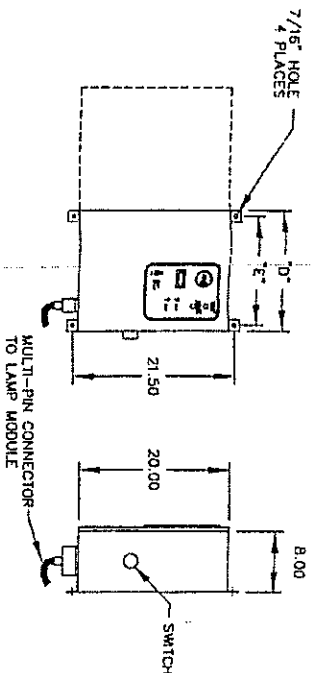


- 1) THE PANEL IS TO BE EXACT 12
- 2) THE MAIN DISCONNECT IS INTERLOCKED WITH THE DOOR.
- 3) FS-1 TO FS-4 CLOSE ON RISNG LEVEL.
- 4) JUMBERS A TO J4 ARE FOR FUTURE SHUTDOWN CIRCUIT
- 5) C11 AND C12 ARE LOCATED ON THE BLACK PAN
- 6) THE PANELBOARD IS TO BE SHIPPED LOOSE.

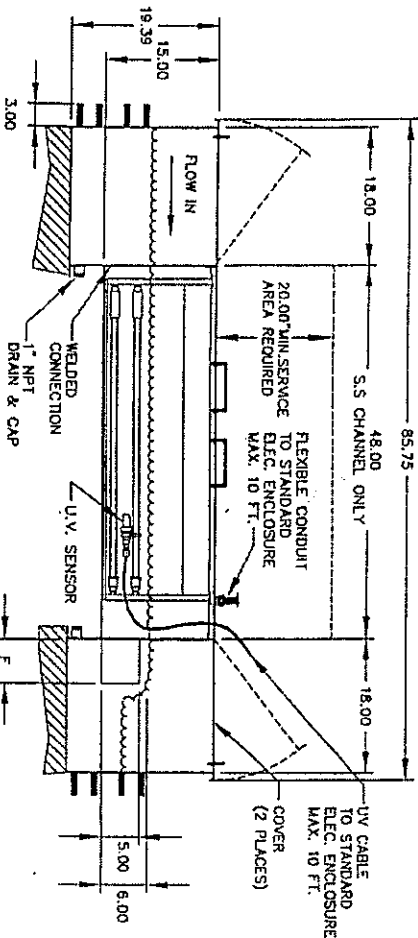
DATE	06/2002	PROJECT	G.A.V.	UNIT	T.N.
SHEET	N.T.S.	NO.	34-13	OF	03
SHELL RESOURCES CAMP FACEMELL IDENTIFICATION, N.T.I. WASTE WATER TREATMENT PLANT POWER & SCHEMATIC DIAGRAM					
SANTHERM ENGINEERING (02413-0140)					



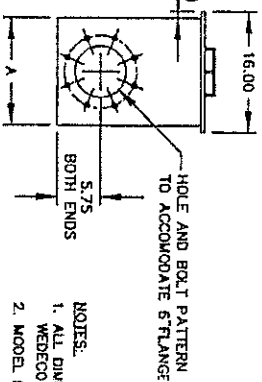
PLAN



SYSTEM CONTROL ENCLOSURE



SECTION A-A



NOTES:

1. ALL DIMENSIONS ARE IN INCHES & TOLERANCES AS PER WEDECO IDEAL HORIZONS' ENGINEERING STANDARDS
2. MODEL ICH-2X1-S SHOWN

SPECIFICATIONS:

1. WETTED PARTS: DISINFECTION CHANNEL MAT'L-304 SS
2. ELECTRICAL: 120V AC/60 HZ SINGLE PHASE
3. ELECTRICAL ENCLOSURE: 304 SS NEMA 4X MODIFIED

MODEL	# OF LAMPS	# OF RACKS	"A"	"B"	"C"	"D"	"E"	"F"
ICH-2X1-S	2	1	14.00	3.125	12.50	16.00	14.50	2
ICH-2X2-S	4	2	14.00	6.125	12.50	20.00	18.50	4
ICH-2X3-S	6	3	14.00	9.125	12.50	20.00	18.50	6

**FOR DISCUSSION PURPOSES ONLY
NOT FOR CONSTRUCTION**

WEDECO Ideal Horizons 212 Ideal Way Poultney, VT 05764 USA (802) 287-4488 Fax: (802) 287-4485 www.wedeco.com		UV DISINFECTION SYSTEM ICH-S SERIES	
Drawn by: VOY Checked by: Approved by: Date: 11/08/01	Project: Location: Revision:	Scale: B Drawing #: ICH-S SERIES	Part:

THIS DRAWING CONTAINS PROPRIETARY AND TRADE INFORMATION WHICH ARE THE PROPERTY OF IDEAL HORIZONS. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF IDEAL HORIZONS, INC.



Sewage Treatment Plant – GOLDEN RULES

This module contains Safe Work Procedure to assist you in safely performing various tasks based on recognized hazards. Although a lot of thought has gone into the development of the SWP, they only serve as a guideline to put you in the right frame of mind prior to conducting a task. It is also realized that some tasks are more critical than others and as such require more stringent procedures.

The following list contains SWP from this module which Shell considers non-negotiable. **Failure to comply to these procedures may result in immediate dismissal.**

GOLDEN RULES

- Any persons that enter the sewage treatment area must first use an air monitor to ensure the proper air quality is available. Anything below an acceptable level must not be entered unless proper steps are taken to ensure acceptable entry.
- Persons who are designated to work in the area must have immunization shots (i.e., Tetanus, Diphtheria and Hepatitis A & B.
- Workers must properly wash was once leaving the contaminated area (hands, face, etc.)
- Any persons with exposed wounds are not permitted in the sewage area.
- Only designated tools are to be used in the sewage area. Those tools are not to be removed and are only used in this area.
- Proper PPE must be worn. Eye glasses, rubber gloves, face masks, disposable or area designated clothing.
- At no time is anyone who has entered the sewage treatment center allowed into the eating area unless properly washed and wearing clean clothing.
- Contaminated clothing is to be immediately removed and washed in the designated washing area.
- UV light is to be managed following the manufacture recommendations.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Extended Aeration Activated Sludge Waste Water Treatment System – Operations and Maintenance Guide

TABLE OF CONTENTS

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Trouble Shooting Guide	7
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Routine and Periodic Maintenance	14

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Extended Aeration Activated Sludge Waste Water Treatment System – Operations and Maintenance Guide

Quick Start Procedure

This procedure is used when the plant is being restarted after being shut down.

1. Check that electrical is still connected. Energize all breakers within the plant panel. Turn on heaters to warm building up.
2. Check that all drains have been closed. Check that pipes are not cracked or broken. Check that all pipes are connected.
3. Ensure weight loaded relief valve on air blower is operational.
4. Check out the air blower as outlined in section 2 item 7 (System Start-up Procedure)
5. Energize breakers within electrical panel after equipment has been checked for operability and required maintenance has been done.
6. If UV bulbs and quartz sleeves were removed reinstall them per section 2 item 8. Clean quartz sleeves as outlined in section 6 item 1.
7. Check that heat tracing on pipe to river is working.
8. Check oil level in Barnes submersible pumps. Check oil levels in air blowers. Grease air blowers.
9. Start up lift station and fill flow equalization chamber. Start up blower and start filling up aeration tanks and then settling tanks.
10. Check submersible pumps for operability. Do not run until they are submerged.
11. It is not recommended that the UV bulbs be energized unless they are at room temperature. Pre warming of the bulbs may be required. Check that UV works electrically. Do not run full time until there is water covering the UV lights in the UV troughs.
12. Divert discharge from plant to lagoon until such time as four samples have an average within the license discharge criteria.
13. Inform Inspector that samples are within criteria and obtain his approval to discharge to the MacKenzie River.

NOTE: Sanitherm have technicians that can come to the camp to provide start-up assistance. If unsure of any part of the start up phone Sanitherm. Telephone number is 1 604 986-9168 (Dave Botwright).

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Extended Aeration Activated Sludge Waste Water Treatment System – Operations and Maintenance Guide

System Start-Up Procedure

1. Ensure the packaged treatment plant is set on level secure ground.
2. Connect the piping and electrical from the aeration container to the container containing the settling, flow equalization and holding tanks.
3. Follow the quick start-up procedure outlined above plus the following:
 - a. Energize the Control Panel.
 - b. Check rotation of all three phase powered equipment within the plant. Energize all circuits within the breaker panel.
 - c. As the building is warming, all control circuitry within the plant should be tested. Turn the selector switch to the blower and pumps quickly on then off to ensure their operation.
4. Checkout the air blowers. Steps in checking out them are as follows.
 - a. Check the unit and all piping for foreign material and clean if required.
 - b. Check the flatness of the feet and the alignment of the drive. Feet that are bolted down in a bind can cause case distortion and internal rubbing. Misaligned V-drives can cause the impellers to rub against the headplates and cause a reduction in the volumetric efficiency of the unit. Misaligned couplings can ruin bearings.
 - c. If blower is V-belt driven, check the belt tension and alignment. Overtensioned belts create heavy bearing loads which leads to premature failure.
 - d. Be sure adequate drive guards are in place to protect the operator from severe personal injury from incidental contact.
 - e. Check the unit for proper lubrication. Proper oil level cannot be overemphasized. Too little oil will ruin bearings and gears. Too much oil will cause overheating and can ruin gears and cause other damage. Insure drive end bearings are greased.
 - f. With motor locked out, turn the drive shaft by hand to be certain the impellers do not bind.
 - g. "Jog" the unit with the motor a few times to check rotation and to be certain it turns freely and smoothly.
 - h. The internal surfaces of all Sutorbilt units are mist sprayed with rust preventive to protect the machine during the shipping and installation period. This film should be removed upon initial start-up.
 - i. Start the unit and operate 15 minutes at no load. During this time, check for hot

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spots and other indications of interference.

- j. Apply the load and observe the operation of the unit for one hour. Check frequently during the first day of operation.

5. Insert the UV bulb(s). Procedure for UV installation is as follows:

- a. Slide lamp into the domed quartz sleeve by inserting the non-connector end of the lamp into the open end of the quartz sleeve. If quartz dome touched or if it is dirty clean with alcohol.
- b. Slide a compression nut over the end of the quartz sleeve.
- c. Place an O-ring over the end of the quartz sleeve.
- d. Insert the domed end of quartz sleeve into the receiver of the lamp rack. An O-ring should be in the receiver end of the lamp rack assembly.
- e. Bring the connector end of the lamp up to the connector in the nipple of the lamp rack and connect them together.
- f. Move the open end of the quartz sleeve forward from the receiver and insert into the nipple on the lamp rack.
- g. Move the o-ring and compression nut up to the nipple. Engage the threads of compression nut and nipple.
- h. Tighten the compression nut by hand until it cannot be turned any further. Then tighten nut by a 1/4 turn with a wrench. **DO NOT OVERTIGHTEN.** This will create a waterproof seal.
- i. After all lamps have been connected, install the lamp racks on the UV bank supports in the channel.
- j. Connect multipin connectors with their receptacles mounted on sides of the wireway.
- k. Install UV sensor on lamp number 1 of the lamp rack assembly and position between lamp 1 and 2. Direct sensor eye towards the number 2 lamp.
- l. The 3-pin connector for the sensor is connected to the outside of the wireway.
- m. It is not recommended that the UV bulbs be energized unless they are at room temperature. Pre warming of the bulbs maybe required. Spare bulbs should be stored in a warm environment.
- n. The ICH UV horizontal disinfection system is designed to operate with the effluent flowing parallel and between the horizontal lamp racks. A dry channel condition may cause the system's lamps to overheat, resulting in a decrease in lamp life and damage to other system components.

ALWAYS MAINTAIN PROPER EFFLUENT LEVELS WHEN OPERATING THIS SYSTEM, ALL LAMPS SHOULD BE SUBMERSED IN THE EFFLUENT AT ALL TIMES.

WATER LEVEL SHOULD BE 1 in. MAX. ABOVE THE TOP OF THE PROTECTIVE QUARTZ SLEEVE OF THE TOP NO.1 LAMP.

6. Start-up UV system. Procedure is as follows.

- a. Turn ON the GFIs located in Ballast Power Enclosure.

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- b. Turn ON the MAIN POWER FEED.
- c. Turn the OFF switch to the ON position on the side of the Ballast Power Enclosure.
- d. Verify that the UV lamps are ON in the first lamp rack assembly by viewing the LED array located behind the display window of the Ballast Power Enclosure.

7. Calibrate UV meter

The ultraviolet meter for each bank of lamps can only be calibrated when the power is "on" and the ultraviolet lamps are operational. Allow the lamps to warm up for 2 minutes prior to any calibrations. This should only be done with new lamps that have been in operation for approximately 100 hrs.

Note: The UV Sensor is located between lamp no.1 and lamp no.2 the sensor eye should be pointed directly at lamp no.2.

- a. To set the low ultraviolet intensity alarms, find the test switches located near the intensity meter on the front inside display panel of the **ballast power enclosure**. Flip the **run/set** switch to the **set** position. The meter will go to approximately 60%.
- b. Adjust the set point by turning the potentiometer marked **set**, located near the test switches.
- c. Turn right (clockwise) for up scale.
- d. Turn left (counter clockwise) for down scale.
- e. Return **run/set** switch to **run** position.
- f. To test for low ultraviolet intensity, turn scale potentiometer, adjusting 0-100% meter scale, down below 60% level. The low UV intensity light will come on. When turning the meter back up, the light/alarm will stay on for 30 seconds.
- g. Set meter at 100%.

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Equipment Shut Down Procedure

1. Flush all discharge lines within the camp with water. The lift station will fill sending the flush water into the sewage treatment plant.
2. Once the camp lines have been flushed disconnect the camp discharge line from the lift station(s). Loosen the lift station(s) lid bolts and slide to on side so the pump and level switch are visible.
3. Disconnect the 2" discharge line at the lift station and plant inlet. Roll line up and store within the plant building.
4. Pump out the sludge holding tank and haul the sludge to the local municipality or alternate site approved by Inspector.
5. Drain the remaining tanks and ship the contents to local sewage treatment plant for further treatment. Wash tanks and piping to remove all solids. A vacuum truck is required to remove all remaining fluid from the tank system.
6. Put tray under valving at grinder pump discharges. Disconnect piping before check valve and drain pipe into tray.
7. Put tray under valving at grinder pump inlets. Disconnect inlet line to grinder pumps and drain piping. Disconnect the submersible sewage pumps and drain their bowls.
8. Leave all drain valves open to prevent them from cracking due to freezing.
9. The fluid within the UV system must be removed. Open the small drains on the UV transition boxes. Drain fluid into bucket.
10. Disconnect piping from blower. Spray rust inhibiting aerosol into pump. Place few packets of silica gel desiccant. Cap of motor. If possible rotate shaft by hand every month.
11. Turn all breakers off.

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Trouble Shooting Guide

<i>Problem</i>	<i>Cause</i>	<i>Possible Remedy</i>
Lift station filling, pump not running	Level switch caught in down position.	Shake lift station tank to free switch Remove tank cover and re-position switch.
	Impeller requires service.	Replace impeller and seal.
	No power to pump.	Check breaker and electric connection.
Blower not turning	No power to blower.	Check breaker and selector.
	Motor starter tripped off	Reset motor contactor and ensure heater pack set points are properly set to full load amperage of the motor
Blower knocking	Unit out of time.	Retime impellers.
	Distortion due to improper	Check mounting alignment and relieve pipe strains.
	Excessive pressure	Reduce to manufacturer's recommended pressure. Examine relief valve, re-set if necessary.
	Worn gears.	Replace timing gears.
	Worn bearings	Replace bearings.
Excessive blower Temperature	Too much oil in gear case.	Reduce oil level.
	Too low operating speed.	Increase blower speed.
	Clogged filter or muffler.	Remove cause of obstruction.
	Excessive pressure differential.	Reduce pressure differential across the blower.
	Worn impeller clearances.	Replace impeller.
	Internal contact.	Correct clearances
Impeller end or tip drag.	Insufficient assembled clearances	Correct clearances.
	Case or frame distortion.	Check mounting and pipe strain.
	Excessive operating pressure.	Remove cause.
	Excessive operating temperature.	Remove cause.
Lack of volume	Slipping belts	Tighten belts
	Worn clearances	Re-establish proper clearances

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<i>Problem</i>	<i>Cause</i>	<i>Possible Remedy</i>
Excessive bearing Or gear wear.	Improper lubrication	Correct lubrication level. Replace dirty oil.
Loss of oil.	Headplate, gear case or drive cover vents plugged.	Clean vents.
Low discharge pressure from blower.	Blockage at intake line.	Remove and clean breather.
High discharge pressure from blower	Blockage at discharge line.	Ensure valve(s) open.
Blower turning in wrong direction.	Incorrect three phase wiring.	Interchange two of the wiring phases. To be done only by licensed electrician.
Blower has intermittent operation.	Motor starter overload	Reset heater packs to proper full load settings. Faulty contactor or heater pack. Replace items.
Supernatant Pump not activating	Control timer in "OFF" mode	Wait for timer to time out.
	Level switch stuck in down position.	Reposition level switch for free movement.
	No power to pump	Check breaker and selector.
Sludge light brown instead of dark brown	Insufficient sludge return	Reduce amount of sludge being wasted
	Plant being started up	Reduce amount of sludge being wasted
Sludge not settling in settling tanks	Too low level of solids in system	Decrease amount of sludge being wasted (sludge too young)
	Too much grease	Cut down kitchen wasting of oils and grease
	Alkaline waste from laundry	Stagger laundry usage
		Use low phosphate detergent
Sludge building up in settling tank	Insufficient activated sludge being wasted	Increase amount of sludge being wasted.
High Coliform reading on discharge sample.	Limited UV radiation	Ensure UV bulbs are on Bulbs may need replacing. UV quartz sleeves require cleaning
	Cross contamination when obtaining sample	Follow proper sampling protocols for collection and handling sample.
High BOD reading on discharge sample	Limited aeration	Increase aeration time

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<i>Problem</i>	<i>Cause</i>	<i>Possible Remedy</i>
	Contamination of influent.	Ensure cleaning products used are biodegradable. Reduce volume of chlorine and ammonia based cleaning agents.
	Plant is "hydraulically overloaded"	Ensure that water inlet rate is less than 70 gpd per person being serviced by plant.
	Cross contamination when obtaining sample	Follow proper sampling protocols for collection and handling sample.
High TSS reading on discharge sample	Contamination of influent	Ensure cleaning products used are biodegradable. Reduce volume of chlorine and ammonia based cleaning agents.
	Cross contamination when obtaining sample	Follow proper sampling protocols for collection and handling sample
	Plant is "hydraulically overloaded"	Ensure that water inlet rate is less than 70 gpd per person being serviced by plant.
Offensive odour from plant	Septic conditions in plant.	Increase aeration or ensure there are not blockages in aeration line. Ensure cleaning products used are biodegradable. Reduce volume of chlorine and ammonia based cleaning agents.
Gray or black biomass	Septic conditions in plant	Increase aeration or ensure there are not blockages in aeration line. Ensure cleaning products used are biodegradable. Reduce volume of chlorine and ammonia based cleaning agents
Clumps of black smelly solids on top of settling tanks	Solids too long in settling tanks	Increase sludge return rate
	Sludge lines plugged	Check and unplug lines
Reddish biomass	Over aeration	Reduce air to tanks
UV system not working	Quartz sleeve is cracked	Remove and replace quartz sleeve (see installation instructions).
	Compression nut seal is leaking	Reseat O-ring and tighten compression nut.

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<i>Problem</i>	<i>Cause</i>	<i>Possible Remedy</i>
	0-ring is damaged	Replace 0-ring and tighten compression nut.
	Liquid tight cable connection is loose or damaged	Contact Ideal Horizons Waste Water Sales Dept. and return the lamp rack assembly to the factory for repair. Attempts to repair the unit by unauthorized person(s) may void the warranty.
	Lamp out indicator is on	Check and verify the location of the lamp out condition. Turn OFF the lamp rack assembly that has the lamp out. Replace the defective lamp and turn the module ON .
	Defective ballast	Verify that the ballast is defective. NOTE: Each ballast controls two (2) lamps in sequence. Verify that two (2) lamps in sequence are out. Lamp numbers are on female 6-pin connector.
	Lamp wiring failure	Use multimeter to test system. Set the meter to the Ohm scale. Turn OFF power to the module. Check point to point from the lamp to its corresponding ballast, looking for an OPEN circuit. If the circuit is open, reseal the connection and retest the circuit. Turn ON module power.
	Lamp Status Board Failure	Locate the suspect lamp status board Turn OFF the corresponding module. Disconnect the LED array connector from the board and remove the board. Replace the suspect lamp status board with a known operational board and turn ON the module. If the problem persists (LED's will not light), follow the

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<i>Problem</i>	<i>Cause</i>	<i>Possible Remedy</i>
		procedure outlined in LAMP WIRING .
	Defective Wiring	Obtain a mutimeter and set to the Ohm scale. Turn the GFI to OFF . Check point to point from the GFI to the power ON relay socket pin in the Ballast Power Enclosure . If a circuit is OPEN , reconnect the wire. If the problem persists, check the ON/OFF/AUTO switch.
	On/off/auto switch	Turn OFF the power to the suspect module at the GFI's in the control box. Module switch needs to be in the ON position. Obtain a multimeter and set to the Ohm scale. Read the resistance between the two contacts on the switch that corresponds to the module in question. If the meter reads OPEN , replace the switch.
	Ultraviolet meter circuit board failure	Turn OFF the power to the bank. Remove the suspect board, and replace it with a known operational board. Turn ON the power and read the ultraviolet intensity on the meter. If the meter reads above 60%, replace the defective board. If the meter continues to read low UV, contact the factory representative.
	Lamp bank failure	If there is a lamp bank failure, or partial bank fail check the following five (4) areas: GFI breaker- SIB ON . Multi- pin connectors should be plugged in Wiring (see previous defective

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<i>Problem</i>	<i>Cause</i>	<i>Possible Remedy</i>
		wiring) ON OFF/AUTO switch-select proper setting
		NOTE: If the GFI breaker has tripped reset the breaker and check the bank. If the breaker continues to trip, inspect the quartz sleeve for cracks or water intrusion. Check ballast assemblies or ground faults.

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Equipment and Flow Description

All the equipment is contained within two containers, which have connecting piping, and electrical cabling installed to tie them together. The electrical supply to these containers is three-phase 210 volt at 60 amps.

Camp sewage flows into a lift station. The lift station periodically pumps the sewage to a flow equalization tank in the first container. A float switch controls the pump. The purpose of the flow equalization tank is to smooth out flow to the aeration tanks. The flow equalization tank is aerated to prevent the sewage from going septic. Microorganisms from the settling tanks are also pumped into this tank. Because there is only a small amount of air being bubbled through the tank, there is not a lot of sewage treatment done in this tank.

Pumps remove sewage from the bottom of the flow equalization tank and grind and pump it to the aeration tanks. These tanks are located in the second container.

Here the sewage is mixed with active (living) microorganisms being returned from the bottom of the settling tanks. This mixture has air bubbled through it. The air mixes the contents and provides air for the microorganisms. A mixture of water and microorganisms overflow the aeration tanks and flows to settling tanks located in the first container.

In the settling tanks the microorganisms settle to the bottom of the holding tank. The water overflows the settling tanks to a holding tank. It then flows from the holding tank through Ultraviolet lights where the light kills any microorganisms left in the water.

Airlift pumps pump the settled sludge out of the bottom of the settling tanks. Some of the sludge is returned to the aeration tanks. The remainder is wasted to either the Solids Holding Tank or Flow Equalization Tank.

The Sludge Holding Tank is also aerated to prevent it from going septic. The air bubbling through the tank ensures that all organic material is consumed. Thus the sludge that settles out is biologically inert. This sludge is pumped out and hauled to the local municipal sewage treatment plant. A pump is located in the middle of this tank to pump the watery liquid left after settlement into the Flow Equalization tank for further treatment.

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Routine and Periodic Maintenance

1. The protective quartz sleeve that encompasses each UV lamp needs to be removed from the channel for cleaning on a routine basis. Any buildup of dirt or scaling on the sleeve must be removed. The cleanliness of the lamp and its protective quartz sleeve is instrumental in the UV systems performance. Cleaning of the lamp rack assemblies should occur every time the intensity drops below 65. Detailed cleaning procedure is as follows:
 - a. Mix one (1) part citric acid to nine (9) parts water in a two-gallon bucket. Rubber gloves, face mask and apron must be worn while cleaning the ultraviolet (UV) lamp rack.
 - b. Disconnect the UV light multi-pin connectors from the wireway to avoid high voltage electrical shock. Remove each rack from the channel for cleaning, one at a time. Make sure the multi-pin connector does not fall into the channel. If you have spare UV lamp racks, replace each rack to be cleaned with a spare to ensure that the bank of lamps are in operation during the cleaning process.
 - c. Wipe down each lamp rack with the citric acid solution
 - d. Rinse down the UV lamp rack and wipe each quartz sleeve with a soft, clean cloth to remove the cleaning solution residue.
 - e. Return the UV lamp rack to its position in the channel and attach the multi-pin connectors to their appropriate connection points. After cleaning of the lamp rack assemblies be certain that the multi -pin connectors have been thoroughly dried before making the connection.
 - f. Repeat the above process for each UV lamp rack.
 - g. If the proper ultraviolet intensity levels cannot be obtained through repeated cleaning of the quartz sleeves of the lamp and the sensor, one of the following may be causing it.
 - i. UV sensor location. - reposition or change the sensor unit located on the lamp rack assembly
 - ii. Plant effluent transmissivity – check effluent for clearness. If not clear fix process problem.
 - iii. Lamps produce less light as they age. The lamp may need to be replaced.
 - iv. The protective quartz sleeve can also degrade due to long exposure to the UV. This exposure causes quartz tube to turn light brown and effect UV output. The quartz sleeve should be replaced.
2. Lift/Sludge/Discharge Pumps –the pumps should be checked daily to ensure they are functioning and that the level switches are able to freely float within their respective tanks. Amperage draw should be checked every month. Increasing amperage indicates water in motor housing and impeller seal should be replaced. Check impeller every 6 months for wear or breakage. Replace as required.
3. Air Blowers – clean inlet filters monthly. Replace as required.

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- Check oil level daily. Add fresh oil as required
- Drain oil from gearbox and replace every 1500 hours (about 2 months)
- Grease bearings in drive end every 500 hours (about 3 weeks)
- Ensure vents on drive end are always open to prevent overpressure damaging seals

Precautionary Note:

The extended activated sludge wastewater treatment system is designed to employ aerobic digestion of organic based contaminants within the wastewater stream. Inorganic matter, that may impact the plants ability to digest and produce consistent quality of treated effluents, such as plastics, cigarette butts, sanitary napkins must be prevented from entering the camp wastewater outfall system.

Large volumes of disinfecting agents, oils, grease, high sudsing detergents, or discharge volume from water softening equipment should also be restricted from entering the camp wastewater outfall system.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Shell Farewell – License N7L1-1762



**Proposed
Wastewater Treatment Plant Modifications**

Mod. 2002-1

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

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Background

A RBC system was installed at Camp Farewell in January, 2001 and operated until the end of April before being shutdown for the summer. It was again started up in December and operated until March 1, 2002. Difficulties were experienced in achieving License discharge criteria during both operating periods. The plant was also modified in an effort to improve its performance however insufficient time until camp shutdown did not allow for conclusive results.

Modification

The wastewater treating plant will be replaced with an "extended aeration system" which is a modified activated sludge system. The activated sludge process has been in existence for close to 100 years and presently represents the most widespread technology for wastewater purification. In general, the activated sludge process is a continuous or semi-continuous aerobic method for biological wastewater treatment.

The activated sludge process is based on:

- Waste water is aerated in a tank
- Bacteria are encouraged to grow by providing oxygen, Food(BOD), correct temperature and time
- As bacteria consume BOD, they grow and multiply
- Treated wastewater flows into a secondary clarifier
- Bacteria cells settle, and removed from clarifier as sludge
- Part of the sludge is recycled back to the activated sludge tank to maintain bacteria population
- Remainder of sludge is wasted

The attached P&ID shows the system design. The proposed process is:

- Raw sewage enters the equalization tank - purpose to smooth out the flows through the unit
- Wastewater is then pumped to the first aeration tank where complete mixing occurs and then flows to the second aeration tank.
- Water then flows to the aerated sludge digester(SHT). It can be recycled from this point for constant flow maintenance.
- Water then enters the final clarifier (FC) which has a sloped bottom for effective sludge removal and recycling.
- Water flows to the chlorine contact tank however this feature will not be utilized at this time.
- The effluent will be disinfected using a dual, oversized ultraviolet light system in series.

The plant has been designed for 120+ people as well as taking into consideration peak loading. It has a nominal treatment capacity of 9000 usgpd and/or a maximum of 37 lbs. BOD5/day. Total volume of the system is approximately 18000 USG.

Benefits of the System over Previous System

The system is conventional in nature, and all design parameters meet typical textbook requirements. Provided these requirements are met, there is extensive operation data available proving that the system can achieve the desired effluent results.

It is being designed and manufactured by Sanitherm Engineering who have 50 years experience in treatment design and a proven track record for camp style units.

The air blowers and the wastewater equalization pumps are duplexed for 100% standby.

This system is not as rate sensitive as the RBC system and has provision for recycling.

The design has taken peak flows into consideration, which the RBC did not.

The RBC had basic design flaws such as flat clarification tank bottom rather than sloped for effective sludge removal.

This system has dual, large ultraviolet lights for disinfection, which are designed for ease of cleaning. The RBC system had one unit, more suitable for potable water disinfection, and very difficult to clean.

Sanitherm will be supplying an extensive operation manual with procedures and tips for the Operator.

Sanitherm has experienced operational personnel on staff and available for process optimization and operator training.

Startup

Installation is anticipated for early July, 2002. Sanitherm personnel with operational expertise will be on site for start up and training of our camp operations personnel.

The Camp Farewell Operations and Maintenance Plan will be updated once the required information on the new treating plant becomes available.



June 11, 2002

Mr. Randy Hetman
DAR/Construction Manager
Shell Canada Limited
400 - 4 Avenue S.W.
CALGARY, AB T2P 2H5

Dear Mr. Hetman:

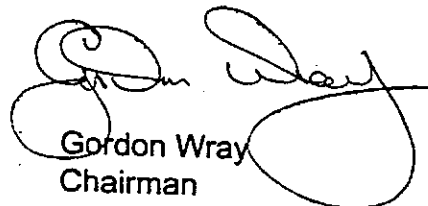
NOTIFICATION OF MODIFICATION

Thank you for your letter of May 24, 2002, and additional information provided on May 30, 2002 notifying the Northwest Territories Water Board of the proposed modifications to the sewage treatment facility. The Board has reviewed the notification and is satisfied that the modification is consistent with the current terms and conditions of your Water Licence.

Please note that as per Part E, Item 3 of your Water Licence, as-built plans and drawings of the new sewage treatment system must be submitted to the Board within ninety (90) days of completion. Please submit a revised Camp Farewell Operations and Maintenance Plan for the new sewage treatment system by September 1, 2002.

If you require further assistance, please contact this office. For enquiries of a technical nature, contact Ms Sarah Aho at (867) 669-2402 or Mr. David Milburn at (867) 669-2650 of the Water Resources Division.

Sincerely,



Gordon Wray
Chairman
N.W.T. Water Board

QUALITY ASSURANCE AND QUALITY CONTROL PLAN
FOR
SURVEILLANCE NETWORK PROGRAM
LICENCE NUMBER: N7L1-1762 RENEWAL

Prepared for:

Shell Canada Ltd.
400 – 4th Avenue SW
Calgary, AB
T2P 2H5

Prepared by:

IEG Environmental
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Calgary, Alberta
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December 2005

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Appendix

A	Definition of Terms
B	CAEAL Accreditation for Taiga Environmental Laboratory
C	Water Licence Approval and Supporting Documents

1.0 INTRODUCTION

This proposed QA/QC Plan is a requirement of Clause B.5 of Northwest Territories Water Board Class B License N7L1-1762 issued to Shell Canada on November 1, 2005. The Plan describes: the types of sampling required; the location of sample collection; the frequency of sampling; sample handling methods and documentation; and the analytical parameters for laboratory analysis. This License is for Camp Farewell in the Mackenzie River Delta, located at Latitude 69° 12'30" N and Longitude 135° 06'04" W in the Northwest Territories.

2.0 SAMPLE COLLECTION

2.1 Location

Water sample collection for laboratory analysis will occur at sampling station 1762-1 (Treated effluent discharge prior to entering the receiving environment). Sign posting will be used to identify the sampling location.

2.2 Sampling Equipment

The collection of effluent at Station 1762-1 will require personal protective gear that should include: disposable latex or Nitrile gloves, rubber boots (waterproof), Tyvek or other protective clothing, and eye protection. For the protection and preservation of the collected water samples, equipment would include: labels for sample identification, laboratory cleaned sample containers (see Table 1), coolers, ice packs, bubble wrap for packing, chain of custody forms, and completed field notes (see section 3.1). Additional equipment that may be required includes a pH meter, electrical conductivity meter, and temperature probe.

TABLE 1
EFFLUENT WATER COLLECTION

PARAMETER	CONTAINER TYPE	SAMPLE SIZE (ml)	PRESERVATION	MAXIMUM STORAGE TIME	FREQUENCY AND LOCATION
BIWEEKLY SAMPLING					
BOD ₅	(black dot) Polyethylene	500 or 750	Refrigerate 4 °C	24 Hours	Biweekly – Station # 1762-1
Total Suspended Solids	(black dot) Polyethylene	500 or 750	Refrigerate 4 °C	28 Days	Biweekly – Station # 1762-1
Faecal Coliforms	(Sterile) Polyethylene	250 or 500	Sodium Thiosulphate (in bottle) Refrigerate 4 °C	24 Hours	Biweekly – Station # 1762-1
Ammonia	(black dot) Polyethylene	500 or 750	Refrigerate 4 °C	28 Days	Biweekly – Station # 1762-1
Oil and Grease	(yellow dot) Wide mouth Brown Glass	1000	4 ml 1:1 H ₂ SO ₄ – Refrigerate 4 °C	N/A	Biweekly – Station # 1762-1
pH	(green dot) Polyethylene	500 or 750	Refrigerate 4 °C	24 Hours	Biweekly – Station # 1762-1
Phosphorus	(black dot) Polyethylene	500 or 750	Refrigerate 4 °C	28 Days	Biweekly – Station # 1762-1
Total Residual Chlorine	(black dot) Polyethylene	500 or 750	Refrigerate 4 °C	28 Days	Biweekly – Station # 1762-1

Note: BOD₅ – Biological Oxygen Demand – 5 day incubation.

2.3 Sampling Methods

Two main categories of samples will be utilized for this program: Test Samples and Control Samples. The test sample method chosen to best characterize the site is Probability Sampling using the Simple Random Sampling method (see Appendix A). In addition to the test sampling, Quality Control (QC) sampling with field blanks, trip blanks, and duplicate samples should be performed typically on 10 percent of the samples to confirm the laboratory results. Therefore, QC samples (blind duplicates) should be collected every three months.

All sampling, sample preservation, and analysis shall be conducted in accordance with method described in the current edition of "Standard Methods for the Examination of Water and Wastewater" (20th ed., 1998).

When sampling in lakes and ponds, the sample bottle is lowered to mid-depth and rinsed three times before collecting the sample on the forth submersion. Ensure the sample container contains adequate room for mixing, preservative addition and thermal expansion.

When sampling stream water, the sample bottle is plunged towards the current and rinsed three times before collecting the sample on the forth submersion. Ensure the sample container contains adequate room for mixing, preservative addition and thermal expansion.

Glass containers should be used when sampling for hydrocarbon (oil and grease) concentrations.

Deviating from the above sampling protocols, water collected for faecal coliforms and oil and grease analysis, the sample is collected during the first submersion and not rinsed three times first.

In general, the protocol for sampling is as follows:

- Acquire all necessary equipment, including; personal protective equipment, sample labels, writing tool (pencil should be used to avoid running), laboratory clean sample containers, sample documenting forms (field notes, field screening results (field pH, EC, and temp values, if required), chain of custody forms, weigh bill for transportation by commercial carrier), coolers and ice packs for sample refrigeration and transportation to the laboratory, bubble wrap for packing, clear packing tape to protect sample labels and seal cooler, camera to photo document sample collection, and any additional equipment required.
- Don personal protective equipment
- At sampling location, if required, perform field screening of pH, EC, Temperature, and observations of water quality of effluent and record values in field notes.
- Label sample containers with information described in Section 3.1.
- Place clear packing tape over label to protect information from "washing off".
- Rinse sample containers with water to be sampled if necessary, do not rinse sample containers for faecal coliforms and oil and grease analysis.
- Collect sample in laboratory cleaned sample container (note: it is imperative that the collected samples be representative of the whole population (i.e. the effluent stream)). Qualitative observations of the sample should also be noted in the field notes at this time (i.e. sample colour, odour, clear-opaque, presence of particulates, etc. Complete Chain of Custody form with required analysis listed for each collected sample.
- Carefully bubble wrap the sample containers and place in ice chilled cooler maintained at ~4 °C for transport directly to the laboratory for analysis. Note: this entire procedure, including the initial laboratory preparation must be completed within the allowable handling time (Table 1) from the time of sampling (e.g. 24 hours).

- Complete field notes and log samples. Retain paperwork for submission to the Board, if required.

Effluent water samples will be collected on a biweekly basis at Station 1762-1 and sent for laboratory analysis. Refer to Table 1 for a summary of parameters to be analyzed, container size, preservation methods, and holding times.

Blind duplicate samples (when collected) will be compared to laboratory results for the normal samples. The "Quality" of the samples and sampling procedures are evaluated from the results of this comparison. If control samples fall out of the allowable statistical standard deviation, the effluent must be sampled again and another blind duplicate collected. If upon re-sampling and re-submission to the laboratory, QC samples continue to be "out of range", then a complete review of the storage of containers prior to sampling, sampling procedures, and the storage and transport of the samples to the laboratory is warranted.

3.0 SAMPLE HANDLING

As sample-handling procedures are imperative to the integrity of the sample, lag times from the time of sample collection to the time of laboratory analysis must be kept to a minimum. Samples for Faecal Coliforms analysis, for example, have a holding time of 24 hours from the time of sample collection to the time of laboratory analysis.

3.1 Documentation

Documentation is an important part of a Quality Assurance Program and includes information on the sample labels as well as in the Field Notebook. The minimum documentation requirements (CCME 1993) for samples include:

- Sampling date
- Sampling time
- Identification number or code
- Sampler's name
- Sampling site (including coordinate/depth where relevant)
- Sampling conditions
- Sample type
- Sampling equipment
- Storage and preservation methods
- Time of storage and of preservation
- Auxiliary information (topography, distance from source, field screening values of pH, EC, and temperature, etc.)
- Deviations from the sampling protocols, if any, and
- Completion of the Chain of Custody (COC) for transport directly to the laboratory.

Additional information on the sample containers to aid in efficient handling includes:

- Analysis required (not just listed on the COC), and
- Label the sample container lid with sample identification number.

A Field Notebook should be retained on-site for future reference and should contain;

- Samplers name, position
- Sampling date
- Weather conditions

- Sampling location conditions
- Time sampling began and ended
- Observations of water (or sample) quality
- Volume of water purged (if applicable)
- Field measurements of pH, EC, and Temperature
- Field Notebook should be photocopied regularly and archived

3.2 Preservation

This procedure is used to ensure the integrity of the collected sample until it is laboratory analyzed. Preservation methods include; refrigeration (refrigerated storage or ice packs) and the addition of chemicals (acids, other preservatives, etc).

Preservation methods can be parameter specific, such as the addition of Sulphuric Acid (H_2SO_4) for Ammonia analysis, or can be a universal method, such as, refrigeration. Refer to Table 1 for the specific preservation method used for each parameter to be analyzed.

3.3 Transportation

The collected samples with complete documentation (sample identification and chain of custody form, as described in Section 3.1) are to be packed in bubble wrap and placed in coolers with ice packs or refrigerated. The packed samples are to be sent directly to the laboratory for analysis (Taiga Environmental Laboratory in Yellowknife, NWT) as soon as possible. Therefore, due to the remoteness of the site, sample collection times must be logistically organized with transportation schedules to the laboratory. This will ensure the samples arrive at the laboratory and are analyzed within the allowable holding time.

4.0 LAB ANALYSIS

4.1 Lab Accreditation

See Appendix B for Canadian Association for Environmental Analytical Laboratories (CAEAL) accreditation of Taiga Environmental Laboratory in Yellowknife.

4.2 Detection Limits

Refer to Table 2 in Section 4.3 for detection limits for each parameter.

4.3 Methodology

Refer to Table 2 in this section for laboratory methods for each parameter.

TABLE 2
METHODS OF ANALYSIS AND DETECTION LIMITS

PARAMETER	CODE	TEST METHOD ¹	DETECTION LIMIT
BIWEEKLY SAMPLING			
BOD ₅	BOD	APHA 5210-B 5 Day incubation - O ₂ electrode	2 mg/L
Total Suspended Solids	Solids-TOTSUS	APHA 2540-D Gravimetric	3 mg/L
Faecal Coliforms	FC (sewage)	APHA 9222-D Faecal Coliforms Membrane Filter Procedure	1 colony/100 ml
Ammonia	NH3-N	APHA 4500-NH3:G Automated Phenate	0.005 mg/L
Oil and Grease	O&G	APHA 5520:B Partition/Gravimetric	0.2 mg/L
Phosphorus	DP	APHA 4500-P:B Automated Stannous Chloride Reduction	0.004 mg/L
Residual Chlorine	Cl ₂	APHA 4500-Cl:G DPD Colourimetric Method	0.01 mg/L
pH	pH	APHA 4500-H:B Electrometric	0.05 pH units

¹Standard Methods for the Examination of Water and Wastewater, 20th ed., 1998

4.4 Reporting Requirements

As indicated in the "Surveillance Network Program" appended to Shell Canada's Class B Water License N7L1-1762;

"The Licensee Shall, within thirty (30) days following the month being reported, submit to the Board all data and information required by the "Surveillance Network Program" including the results of the approved Quality Assurance Plan."

In addition to the monthly reporting of effluent quality, Shell Canada shall file an Annual Report with the Board not later than March 31 of the year following the calendar year reported. This report shall contain:

- The total quantities in cubic metres of fresh water obtained from all sources;
- The total quantities in cubic metres of each and all waste discharged;
- The location and direction of flow of all Waste discharged to the Water;
- The results of sampling carried out under the Surveillance Network Program;
- A summary of any modifications carried out on the Water Supply and Waste Disposal Facilities, including all associated structures;
- A list of any spills and unauthorized discharges;
- Details on the restoration of any sumps;
- Any revisions to the approved Contingency Plan; and
- Any other details on water use or waste disposal requested by the Board within forty-five (45) days before the annual report is due.

APPENDIX A

Definition of Terms

Quality Assurance: is the system of activities designed to better ensure that quality control is done effectively.

Quality Control: is the use of established procedures to achieve standards of measurement for the three principal components of quality; precision; accuracy; and reliability.

There are two main categories of samples; Test Samples and Control Samples.

Test samples are basic samples used to characterize a site. The number of test samples depends on the degree of confidence required to characterize the site and on the number of samples needed for each analytical method. There are various approaches to collecting test samples:

- *Accessibility Sampling* - The sample is restricted to a part of a population that is readily accessible. It may be justified when resources of time, money or physical access, prevent any other type of sampling being taken, but there is little other justification.
- *Haphazard Sampling* - Taken when, although other samples may be accessible, there is no plan to control the probability of choosing a sample. It is really of value only if a very homogenous population over time and space is being sampled, which is generally unknown at the time of sampling (if it was known, samples would probably not be required). This is very difficult to justify and this method is not recommended.
- *Judgment (or Purposive) Sampling* - Taken when specific samples are selected for their unique value of interest, not for making inferences about the population. Judgment Samples may also be taken when the target population is well defined and homogenous, but the same concerns described for Hap-Hazard Sampling apply. Since you are generally sampling because you do not know the population, this is not recommended.
- *Probability or Representative Sampling (suggested for this project)*. Probability or representative sampling is the most important type of sampling and is aimed at ensuring that valid conclusions can be drawn about a population from a sample. Various approaches to this include;
 - *Random Sampling* – the sample is selected by chance mechanism with known probability of selection. This method of sampling is also divided into Simple Random Sampling and Stratified Random Sampling.
 - *Simple Random Sampling* – When a population is large and homogeneous and every possible sample has an equal probability of being selected.
 - *Stratified Random Sampling* – When a population is large and heterogeneous, it can be subdivided, the subdivisions sampled and, if necessary, the results combined.
 - *Grid Sampling* – When systematic samples are taken in a specified pattern, usually a grid, with the samples collected at the grid nodes.
 - *Stratified Sampling* – When a specified number of random samples are taken in a specified pattern or within a cell, usually a grid.

Control samples / Quality Control (QC) samples, which may be simulated samples, are used to control the analytical process. They are often regarded as synonymous with QC check samples. The term is also used to describe samples taken outside the target area, in order to provide a “background” reading.

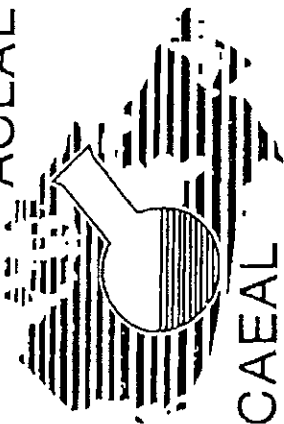
Preservation is control methods used to ensure the integrity of the collected sample until it is laboratory analyzed. Preservation methods include; refrigeration (refrigerated storage or ice packs), the addition of chemicals (acid, base, preservatives, etc), and filtration.

Detection Limit refers to the minimum concentration of analyte that can be measured above the background noise of an instrument.

Analyte is a solution containing a parameter of interest in a known concentration.

APPENDIX B

ACLAE



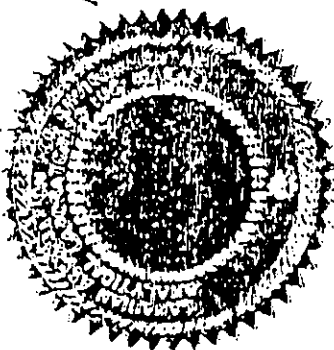
Canadian Association for Environmental Analytical Laboratories Inc.

Certificate of Accreditation

Taiga Environmental Laboratory
Indian and Northern Affairs Canada
4601 - 52nd Avenue
P.O. Box 1500
Yellowknife, Northwest Territories

having met the requirements of ISO/IEC 17025 - 1999 (*General Requirements for the Competence of Testing and Calibration Laboratories*) and any additional program requirements, is deemed competent and hereby accredited for specific tests listed in the scope of accreditation approved by CAEAL..

Accreditation No. A2635 Accreditation Date January 3, 2005
Issued on January 3, 2005 Expiry Date January 3, 2008

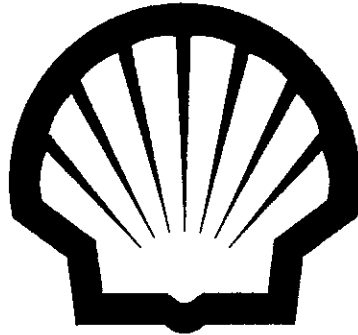


L. McKean
President

This certificate is the property of Canadian Association for Environmental Analytical Laboratories Inc. and must be returned on request, reproduction must follow guidelines in place at date of issue. For the specific tests to which this accreditation applies, please refer to the Laboratory's scope of accreditation at www.caenal.ca

APPENDIX C

400 - 4th Avenue SW
P.O. Box 100, Station M
Calgary, Alberta T2P 2H5
TEL (403) 691-3111



CAMP FAREWELL EMERGENCY RESPONSE PLAN

December 2000

AMENDED OCTOBER, 2002

AMENDED MAY, 2003

AMENDED JULY, 2003

Amended January 2006

Copy # 4

FAREWELL EMERGENCY RESPONSE PLAN**TABLE OF CONTENTS**

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FAREWELL EMERGENCY RESPONSE PLAN**1.0 PURPOSE**

The following document is intended to serve as a template for use in the development of Site-Specific General Emergency Response Plans (ERP's) within the Wells, Approvals and Seismic Operations (WA&SO) Department within Shell Canada Limited E&P.

ERP's are to be continually revised and updated to include relevant site-specific emergency response information. Revisions / updates to the ERP will be completed prior to initiating any phase of a program (i.e. Construction, Drilling, Well Services, Seismic Operations, etc).

2.0 SCOPE

All emergencies other than H₂S gas (sour gas) related emergencies are addressed in this ERP template. For projects where sour gas has been determined as a potential threat (see 3.0 Hazard Assessment) the ERP for this specific threat shall be covered in separate Site-Specific Sour Gas Drilling, Completions, Testing ERP.

WA&SO's Site-Specific General ERP is to be used in conjunction with the E&P Model ERP. The E&P Model ERP contains supporting information and forms that can be used in conjunction with this document.

3.0 HAZARD ASSESSMENT

Prior to developing a Site-Specific General ERP, a hazard assessment shall be conducted to determine potential emergency scenarios (hazards / threats). There are several activities within WA&SO that can provide information regarding potential emergency scenarios. Determine which activities are applicable to the project that will aid in determining potential emergency scenarios.

- ☒ HSE&SD Process
- ☐ DWOP
- ☐ CWOP
- ☒ Planning Meeting
- ☐ Pre-Spud Meeting
- ☐ _____
- ☐ _____

Section 11.0 shall be revised to reflect the emergency scenarios identified in the hazard assessment.

FAREWELL EMERGENCY RESPONSE PLAN**6.0 MEDICAL INFORMATION**

All workers should provide personal medical information to be used in the event of a medical emergency. All workers, upon arrival onsite, will fill out the medical information form (Appendix II) to be submitted to the Medic. If a Medic is not available, the Onsite Shell Representative shall keep the sensitive information in a sealed envelope. Medical information is to be kept strictly confidential and will be destroyed at the end of each project. By signing the form, the worker is authorizing this information to be released to the Medic or other medical personnel during a medical emergency. For further information, refer to Shell's Privacy Policy.

7.0 TRAINING

Emergency Response training requirements shall be fulfilled prior to work to ensure an effective response to potential emergency scenarios. Training will include the use of/and maintenance of emergency response equipment, contact information, roles and responsibilities, communication equipment, etc. Each person's qualifications shall be verified.

7.1 Training	<input checked="" type="checkbox"/>	emergency first aid	Name: _____
	<input type="checkbox"/>	standard first aid	Name: _____
	<input checked="" type="checkbox"/>	EMT-P	Name: _____
	<input checked="" type="checkbox"/>	Incident Command System	Name: _____
	<input checked="" type="checkbox"/>	fire fighting (dry chem.)	Name: _____
	<input type="checkbox"/>	confined space	Name: _____
	<input checked="" type="checkbox"/>	spill response	Name: _____
	<input type="checkbox"/>	_____	Name: _____
	<input type="checkbox"/>	_____	Name: _____

8.0 TRAVEL INSTRUCTIONS

Directions to the worksite need to be documented and posted throughout the worksite to ensure the safe and timely arrival of emergency support equipment and personnel (i.e. ambulance, fire-fighting equipment, etc.). The Emergency Contact Information Sheet (Section 9) will have an area designated for directions. The directions shall be clear and concise.

Contact information shall be specific to the working area of the project. Specific numbers shall be verified to ensure the proper response can be asserted.

FAREWELL EMERGENCY RESPONSE PLAN

HOSPITAL			
INUVIK	867 777-8161 Emergency Room	867 777-8000 Switchboard	867 777-8062 Fax
RCMP			
INUVIK	867 777-1111		
FIRE			
INUVIK	867 777-2222		
AMBULANCE			
INUVIK	867 777-4444		
AIRCRAFT SUPPORT			
Canadian Helicopters	Inuvik	867 777-2424 or 867 678-0091	867 777-3448[f]
Aklak Air	Inuvik 24hr Office Hours	867 777-3555 or 867 777-3777	867 777-3388[f]
INFORMATION SERVICES			
Alberta Poison Center		1 800 332-1414	
CANUTEC		1 613 996-6666 Emergency	1 613 992-4624 Information

WORKPLACE HEALTH AND SAFETY			
NWT WCB	24hr	1 800 661-0792 1 867 920-3888	1 866 277-3677[f] 1 867 873-4596[f]
ENVIRONMENTAL REPORTING			
NWT Spill Reporting	24hr	867 920-8130	867 873-6924[f]
EMERGENCY MANAGEMENT			
INDIAN & NORTHERN AFFAIRS			
Inuvik Office		867 777-3361[b]	867 777-2090[f]
ENVIRONMENT CANADA			
Spill Response - Canadian Wildlife Service	24hr Pager	867 920-5131 Leave message	
ENVIRONMENT AND NATURAL RESOURCES - NWT			
Environmental Protection Division	General	867 873-7654	867 873-0221[f]
Wildlife Division - Inuvik	Manager - Wildlife & Fisheries	867 777-7230[b] 867 777-1185[c] 24hr	867 777-7321[f]

FAREWELL EMERGENCY RESPONSE PLAN

TRANSPORTATION SAFETY BOARD / NATIONAL ENERGY BOARD			
Transportation Safety Board	THE TSB WILL NOTIFY NEB OR OTHER APPLICABLE DEPT.	1 819-997-7887	
NEB General Inquiries		1 800 899-1265	
FISHERIES & OCEANS CANADA			
CCG Regional Operations Center (ROC)		1 800 265-0237 24HR	

SHELL CRISIS MANAGEMENT TEAM (CMT)			
E&P Crisis Manager	1 888 361-8055 [Pager #44204]		
E&P Core CMT (Crisis Management Team)	1 888 361-8055 [Pager #44298]		
SHELL OPERATIONS TECHNICAL ADVISORY CENTRE			
Shell Centre, Calgary, Room 902		403-691-3104 [b]	
WA&SO HEAD OFFICE CALGARY			
Manager, WA&SO David Todd	403-691-2700 [b]	403-660-6900[c]	1-888-361-8055 [PAGER #44202[
PUBLIC AFFAIRS			
Adrienne Lamb	403-691-4978 [b] 403-606-4205 [c]	1-888-361-8055 [PAGER #44262[403-269-8031[f]
Laurieanne Lynne	403-691-3892 [b] 403-680-2654 [c]	1-888-361-8055 [PAGER #44290]	403-269-8031[f]

SHELL EMERGENCY COMMUNICATIONS TRAILER			
CUSTODIAN : C&V – Trailer Yard, Calgary	Doug Delorme	403-620-0442 24hr	403-279-7451 Message
COMMUNICATIONS			
OPERATOR:	Clearing lines or line interruption	0	
Shell Contact :	Ian Lucas	403-691-4049 [b] 403-542-4755 [c]	403-691-3985 [f]
NewNorth Networks	Tom Zubko	867 777-2111 [b] 867 777-6190 [c]	867 777-3412 [f]
SPILL SERVICES			
Mackenzie Delta Spill Response Corp. (MDSRC)	Spill Response Advisor (Linda Manka)	403 296-4014	403 296-5147[f]
Western Canada Spill Services (WCSS)	Equipment Coordinator Mark Miller	403 250-0897 403 803-6065	403 291-9408[f]
OILFIELD FIRE SERVICES			
HSE Integrated	Calgary	1-888-346-8260 24hr	
Firemaster Oilfield Services Inc.	Red Deer	403-342-7500 24hr	

FAREWELL EMERGENCY RESPONSE PLAN

11.0 EMERGENCY RESPONSE PROCEDURES

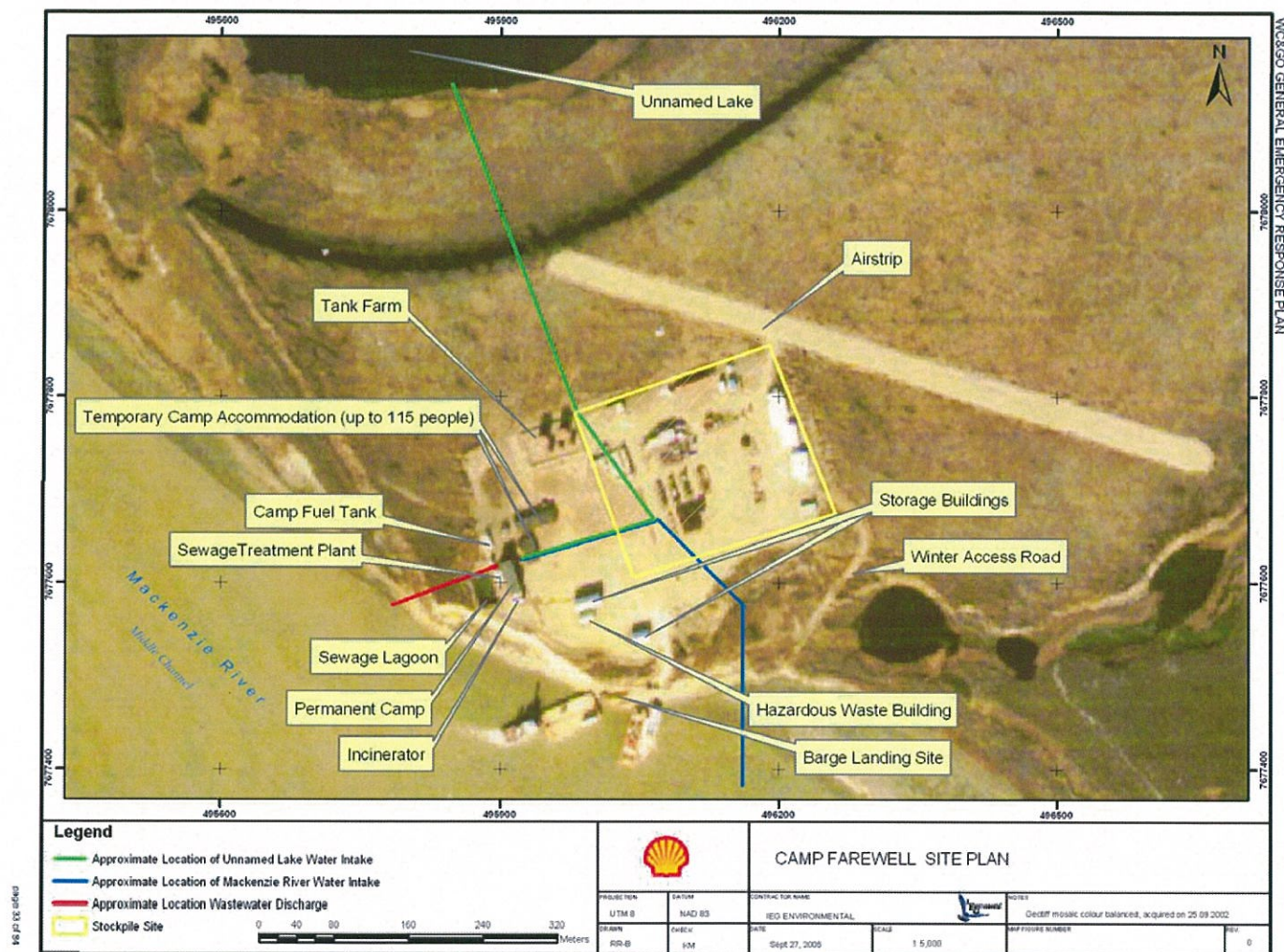
Below are templates designed to assist in the development of detailed procedures for Site-Specific emergency response scenarios. Note that each of these steps could require modification during any phase of the project. Refer to Section 404 of the E&P Model ERP

11.1 INJURY INCIDENTS

11.1.1 Emergency Response Procedures (Injury Incidents)	<p>Procedure:</p> <ol style="list-style-type: none"> 1. Ensure personal safety. Consider the following prior to responding: <ul style="list-style-type: none"> • evacuate area • determine safe approach • no approach • determine what happened • don personal protective equipment 2. Isolate the area and restrict / deny entry as required to prevent additional injuries: <ul style="list-style-type: none"> • establish a parameter • isolate / shut off energy sources, stabilize (high pressure, electrical, unstable objects, ignition sources etc.) 3. Notify appropriate personnel: <ul style="list-style-type: none"> • supervisor • rescue team • bystanders 4. Muster in designated area: 5. Determine individual roles and responsibilities: <ul style="list-style-type: none"> • assign incident command system roles as resources become available • add to the ICS chart provided • do not rush into anything 6. Provide medical attention as required: <ul style="list-style-type: none"> • remove victim from danger or danger from victim • provide medical attention as required 7. Transport victim for advanced medical treatment as required. Consider to following:
---	---

FAREWELL EMERGENCY RESPONSE PLAN

10.0 FAREWELL SITE PLAN



FAREWELL EMERGENCY RESPONSE PLAN

	<ul style="list-style-type: none">• medical conveyance via ground• air medivac <p>8. Conduct incident "De-brief"</p> <p>9. Serious and dangerous occurrences shall be reported to the WCB's 24-hour Accident Reporting Line. See Emergency Contact List. Complete Worker's Report of Accident and Employer's Report of Accident.</p>
--	---

FAREWELL EMERGENCY RESPONSE PLAN**11.2 ILLNESS**

11.2.1 Emergency Response Procedure (Illness Incident)	Procedure: <ol style="list-style-type: none">1. Provide onsite medical / first aid treatment2. Notify the patient's supervisor and medic (if available) immediately<ul style="list-style-type: none">• the onsite supervisor/medic will consult the patients medical information form for medical information purposes3. Contact medical care facility for instructions regarding treatment options and transportation4. Stabilize patient for transport to medical care facility as required
--	---

11.3 WEATHER RELATED EMERGENCIES

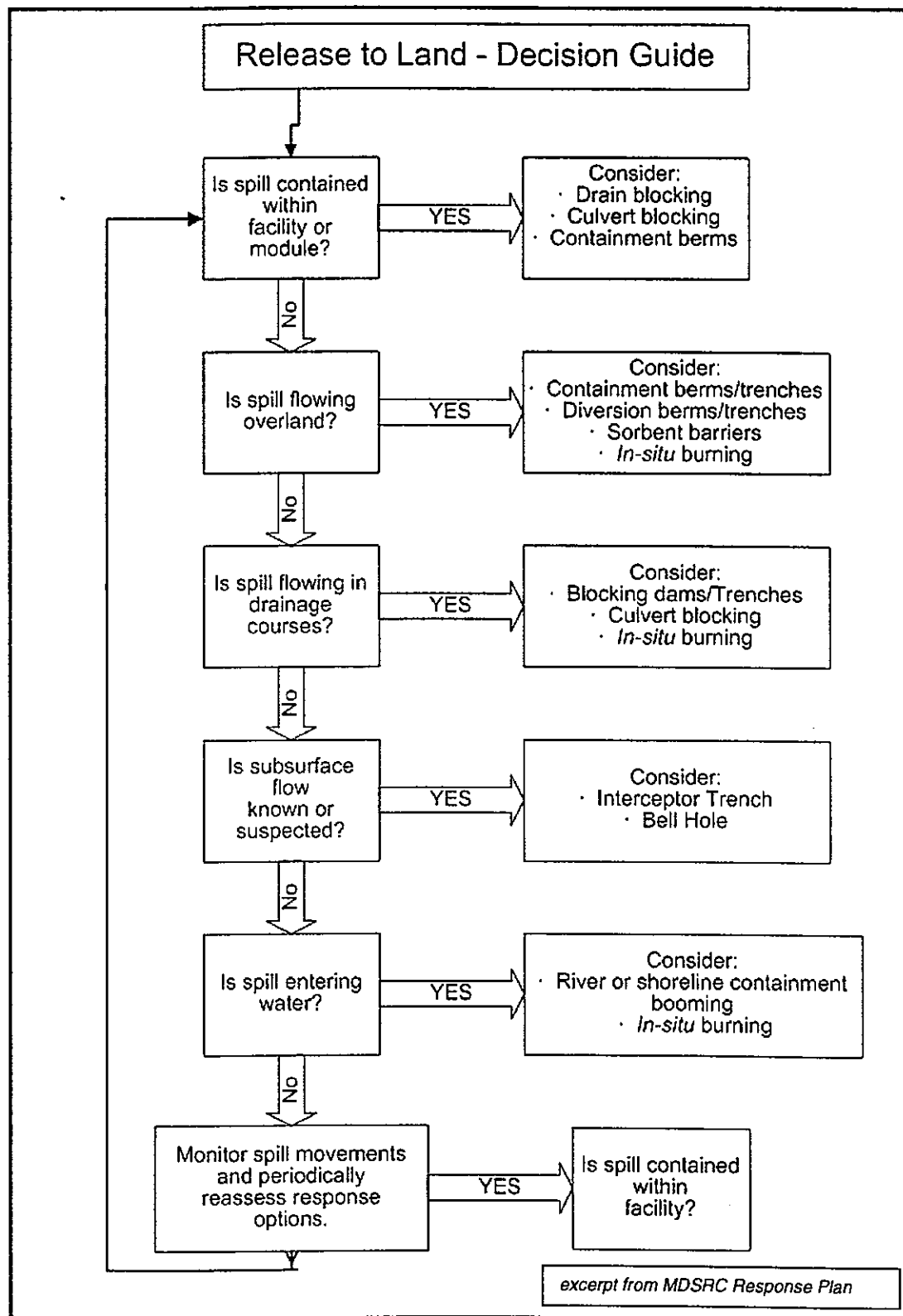
11.3.1 Emergency Response Procedures (Weather Related Emergency)	Procedure: <ol style="list-style-type: none">1. Notify all personnel of the weather related emergency<ul style="list-style-type: none">• contact internal and external parties2. Secure equipment from the effects of the wind / snow build-up, etc.3. Suspend operations as deemed necessary<ul style="list-style-type: none">• consider a travel ban until weather improves maintain communications with remotely located operations (i.e. seismic workers, surveyors, etc.)4. Muster in designated area
---	--

FAREWELL EMERGENCY RESPONSE PLAN**11.4 FIRES AND EXPLOSIONS**

<p>11.4.1 Emergency Response Procedure (Generic Fire & Explosion)</p> <p>Refer to E&P Model ERP Section 403 for additional fire response strategies.</p>	<p>Procedure:</p> <ol style="list-style-type: none"> 1. Ensure personal safety. Consider the following prior to responding <ul style="list-style-type: none"> • evacuate • don personal protective equipment 2. Isolate the area and restrict / deny entry as required to prevent injuries <ul style="list-style-type: none"> • establish a safe parameter 3. Notify appropriate personnel <ul style="list-style-type: none"> • sound the alarm • supervisor • rescue team 4. Muster in designated area 5. Determine individual response roles and responsibilities <ul style="list-style-type: none"> • assign incident command system roles as resources become available 6. Assess the hazard. Determine whether or not to fight the fire. Is there a need to fight the fire? Consider: <ul style="list-style-type: none"> • identify / isolate fuel sources if safe to do so • the type of fire and the equipment available to fight the fire. • are personnel trained to fight the fire 7. Utilize appropriate protective equipment <ul style="list-style-type: none"> • fire retardant clothing • call for backup equipment 8. Establish / adjust control perimeters (hot, warm, cold) <ul style="list-style-type: none"> • identify additional hazards and assess the risks
---	---

FAREWELL EMERGENCY RESPONSE PLAN**11.5 CAMP FIRES**

11.5.1 Emergency Response Procedure (Camp Fire) . MUSTER AREA: SHOP BUILDING	Procedure: 1. Ensure personal safety. Consider the following prior to responding: <ul style="list-style-type: none"> • Sound the fire alarm. • Assess the fire; if it is small enough, extinguish with fire extinguisher • Shut door(s) and window(s) in the room you are evacuating • If smoke builds up, stay low to the ground • Notify the incident commander immediately • Evacuate and remain at the muster area until instructed to do otherwise by incident commander 2. Incident Commander <ul style="list-style-type: none"> • Take a radio for communication. • Ensure that the fire alarm has been sounded throughout the camp. • Quickly go to the fire scene to assume command • Meet with the Emergency Response Team to assess action already taken and further action required. 3. Medic (on site rep if not medic) <ul style="list-style-type: none"> • Evacuate to the muster area with your first aid pack • Take a radio for communication • Treat any burns or other related injuries • If required, transport patient(s) to hospital via ECV or helicopter, depending on nature of injury 4. Emergency Response Team Members Shell Onsite Rep: _____ Camp Supervisor: _____ Medic: _____ _____ <ul style="list-style-type: none"> • Ensure that each member has a radio for communication • As first line of defense, shut the breaker to the trailer(s) off • Check each room to ensure that all camp personnel have vacated the trailers • Report to the incident commander for a head count and debriefing • If it is safe to do so, extinguish the fire • Take a head count of camp personnel • If required and safe to do so, locate missing personnel
--	--

FAREWELL EMERGENCY RESPONSE PLAN**11.6 SPILLS****11.6.1 Release to Land - Decision Guide**

FAREWELL EMERGENCY RESPONSE PLAN

11.6.2 Sewage Spill Emergency Response Plan

The campsite is located between a small lake and a channel of the Mackenzie River. The sewage treatment plant is self-contained. There is a bypass line from the lift station to an existing lagoon so that any overflow from the lift station goes to the lagoon. If treated water is not up to specification; it will be diverted to the lagoon. The water from the lagoon will then be treated through the sewage plant at a later date for completion to specification.

Transportation

There will be transportation of sludge from the sewage treatment plant to the treatment plant in Inuvik.

Maintenance and Control

This contingency plan is project specific and will be reviewed:

- As changes to applicable environmental legislation come into effect
- To take into account changes in environmental factors and in facility characteristics and policy
- During any onsite training exercises
- After each and every sewage incident.

Changes to phone numbers and names of those individuals identified in this contingency plan will be made on an as required and when required basis.

The prioritized response goals are:

- Protect Human Life (yours, fellow worker, & public)
- Protect The Environment
- Minimize Asset Loss
- Regain Steady State Operations to minimize business impact (consider both revenue & reputation)

The objectives of a spill response are:

- Safety of People, Environment, and Facilities
- Source Control
- Containment of released materials
- Recovery and Storage of released materials.

Procedure**1. SAFETY****Ensure personal safety**

- ◆ Ensure your own personal safety from existing and potential hazards and fellow worker safety.
- ◆ If the spill is within the treatment plant area, follow Sewage Treatment Golden Rules.

2. ISOLATE AND DENY ENTRY**Isolate the area and deny / restrict entry**

- ◆ Utilize vehicles or barricades for temporary control.
- ◆ Establish / adjust control perimeters.

FAREWELL EMERGENCY RESPONSE PLAN

3. NOTIFICATIONS

Immediately notify the following

- ♦ Shell's on site supervisor

Notify the following as soon as practical

- ♦ DAR/Construction Manager
- ♦ Northwest Territory Emergency Spill Response Line

4. COMMAND / MANAGEMENT

Order depends on specific factors

- ♦ Assign Incident Command System roles as resources become available.
- ♦ Initiate response to incident, taking existing conditions into account.
- ♦ Ensure safety precautions and operating plans and conditions are reviewed with the crew.
- ♦ Determine a need for roadblocks.
- ♦ Ensure proper permits are executed.

5. IDENTIFICATION AND HAZARD ASSESSMENT

Identify the Hazards and Assess the Risks

- ♦ Determine chemical makeup of substance (i.e.: WHMIS, TDG Placards, PIN Nos.).
- ♦ MSDS (Material Safety Data Sheets – Chemical).
- ♦ Placards and labels (colours, markings).
- ♦ Shipping papers (Bill of Lading, Way Bill, etc).
- ♦ Technical information (CANUTEC).
- ♦ Other (specialists, monitoring devices).

6. PROTECTIVE EQUIPMENT

Ensure proper personal protective equipment is utilized, and know the level of equipment available

- ♦ Visibility stripes, safety glasses, goggles, life jackets, gloves etc.

7. CONTAINMENT AND CONTROL

Safe defensive containment

- ♦ If safe to do so, and if possible, stop the flow of material.
- ♦ If spill frozen shovel snow-sewage or soil-sewage mixture into containers or sewage lagoon.
- ♦ Deploy absorbent pads, socks as required.
- ♦ See list of emergency spill cleanup equipment in equipment list
- ♦ Recover sorbents and place in steel drums
- ♦ Notify and request assistance if required from external NWT Emergency Spill Response Line.
- ♦ Consider what resources /materials are available within close proximity; i.e.: crawler tractor, loaders, bobcats, vacuum /water trucks, fuel bladders / fibreglass tanks.

7. DECONTAMINATION AND CLEANUP

Collect, cleanup, and sample

- ♦ Priority is to high environmentally sensitive areas (municipality water sources, waterfowl staging areas, domestic fishing areas).
- ♦ Decontaminate personnel as required if exposed to the spill. Wash hands and face with soap after clean up.

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- ◆ Contaminated clothing shall be immediately removed and washed in designated washing area.
- ◆ Store the spilled material in proper containers for disposal;
- ◆ Implement remediation program for the area as required;
- ◆ Monitor the progress of remediation as required.

8. DISPOSAL

Dispose of wastes, contaminated clothing and equipment if unable to decontaminate.

- ◆ Incinerate sorbents – check Product MSDS for incineration suitability.
- ◆ Small quantities of snow-sewage or soil sewage can be disposed in the sewage lagoon.
- ◆ Warm up containers of snow and sewage mixture to room temperature in treatment plant and then over the time frame of a couple of weeks pour them into the flow equalization tank of the sewage plant. The reason for introducing the snow sewage mixture slowly and at room temperature is to avoid a large shock loading of the plant that will affect the micro organisms or ship containers to Inuvik Sewage Treatment Plant for disposal.
- ◆ Larger quantities of sewage contaminated soils may have to be treated in a contained area. Obtain remediation expertise. Note: contaminated runoff water in the treatment cell must also be contained.

10. DOCUMENTATION

Document all actions and complete reports

- ◆ Assign a recorder to log activities
- ◆ Complete and submit a follow-up spill report to the Northwest Territories Spill Report line.

FAREWELL EMERGENCY RESPONSE PLAN

11.6.3 Bulk Material Emergency Response Plan

The campsite is located between a small lake and a channel of the Mackenzie River. Bulk Materials are stored in seacans and various other containers.

Transportation

There will be drilling products transported to and from the site.

Maintenance and control

This contingency plan is project specific and will be reviewed:

- As changes to applicable environmental legislation come into effect
- To take into account changes in environmental factors and in facility characteristics and policy
- During any onsite training exercises
- After each and every incident.

Changes to phone numbers and names of those individuals identified in this contingency plan will be made on an as required and when required basis.

Prioritized Response Goals

The prioritized response goals are:

- Protect Human Life (yours, fellow worker, & public)
- Protect The Environment
- Minimize Asset Loss
- Regain Steady State Operations to minimize business impact (consider both revenue & reputation)

The objectives of a spill response are:

- Safety of People, Environment, and Facilities
- Source Control
- Containment of released materials
- Recovery and Storage of released materials.

Procedure

1. SAFETY

Ensure personal safety

- ◆ Ensure your own personnel safety from existing and potential hazards and fellow worker safety.
- ◆ In addition to standard personal protective equipment, check MSDS sheets for additional requirements

2. ISOLATE AND DENY ENTRY

Isolate the area and deny / restrict entry

- ◆ Utilize vehicles or barricades for temporary control.

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- ◆ Establish / adjust control perimeters.

3. NOTIFICATIONS

Immediately notify the following organizations.

- ◆ Shell's onsite supervisor

Notify the following as soon as practical

- ◆ Shell's DAR/Construction manager
- ◆ Northwest Territory Emergency Spill Response Line
- ◆ Indian Northern Affairs Canada - requirements as per protocol in Appendix IV
- ◆ NEB - requirements as per protocol in Appendix IV and/or spill is not contained and could result in further safety property or environmental damage.

4. COMMAND / MANAGEMENT

Order depends on specific factors

- ◆ Assign Incident Command System roles as resources become available.
- ◆ Develop the response plan.
- ◆ Ensure safety precautions and operating plans and conditions are reviewed with the crew.
- ◆ Determine a need for roadblocks.
- ◆ Ensure proper permits are executed.

5. IDENTIFICATION AND HAZARD ASSESSMENT

Identify the Hazards and Assess the Risks

- ◆ Determine chemical makeup of substance (i.e.: WHMIS, TDG Placards, PIN Nos.).
- ◆ MSDS (Material Safety Data Sheets – Chemical).
- ◆ Placards and labels (colours, markings).
- ◆ Shipping papers (Bill of Lading, Way Bill, etc).
- ◆ Technical information (CANUTEC).
- ◆ Other (specialists, monitoring devices).

6. PROTECTIVE EQUIPMENT

Ensure proper personal protective equipment is utilized, and know the level of equipment available

- ◆ Visibility stripes, safety glasses, goggles, life jackets, gloves etc.
- ◆ Check MSDS sheets for additional requirements

7. CONTAINMENT AND CONTROL

Safe defensive containment

- ◆ If safe to do so, and if possible, stop the flow of material.
- ◆ Ensure that flow is contained before starting the recovery procedure. Containment and recovery may take place at the same time
- ◆ See list of emergency spill cleanup equipment
- ◆ Shovel spilled material into plastic lined steel drums.
- ◆ If ground frozen, in spring excavate surface area to ensure all spilled material is collected
- ◆ Notify and request assistance if required from external NWT Emergency Spill Response Line.
- ◆ Consider what resources /materials are available within close proximity; i.e.: crawler tractor, loaders, bobcats, vacuum /water trucks, fuel bladders / fibreglass tanks, lost circulation material, straw bales, etc.

FAREWELL EMERGENCY RESPONSE PLAN

8. DECONTAMINATION AND CLEANUP

Collect, cleanup, and sample

- ◆ Decontaminate personnel as required if exposed to the spill
- ◆ Priority is to high environmentally sensitive areas (municipality water sources, waterfowl staging areas, domestic fishing areas).
- ◆ Store the spilled material in proper containers for disposal;
- ◆ Determine where the spilled material can be disposed off and ship material there.
- ◆ Develop remediation program for the area (if required)
- ◆ Undertake the remediation program:
- ◆ Monitor the progress of remediation as required.

9. DISPOSAL

Dispose of wastes, contaminated clothing and equipment if unable to decontaminate.

- ◆ Consider waste impacts in all decisions
- ◆ Remove the contaminated material and haul to an approved disposal site.

10. DOCUMENTATION

Document all actions and complete reports

- ◆ Assign a recorder to log activities
- ◆ Complete and submit a follow-up spill report to the Northwest Territories Spill Report line.

FAREWELL EMERGENCY RESPONSE PLAN

11.6.4 Fuel/Spill Emergency Response Plan (Water)/Coast Guard Oil Pollution Emergency Plan

Camp Farewell is located between a small lake and the Middle Channel of the Mackenzie River. Camp Farewell is 50 km downstream from Tununik Point at Longitude 69°-12'-30" and Latitude 135°-06'-04". All fuel on site is stored in tanks within secondary containment. A spill could occur during unloading fuel from barges. To minimize the severity of such an event, spill control equipment will be deployed during the unloading. The deployment of the barge booms will also be requested as a precautionary measure to immediately contain any spill that may occur at the barge. If a land spill did occur it would be contained quickly and therefore minimize the potential for contamination of the waterway

There are no communities downstream of Camp Farewell.

Transportation

Liquid fuels will be stored in closed systems during transportation. Access routes will be by barge through channels of the Mackenzie River. During the winter season, fuel will be delivered from Camp Farewell by fuel truck to project locations.

Maintenance and Control

This contingency plan is project specific and will be 1) reviewed & 2) updated:

- As changes to applicable environmental legislation come into effect
- Annually, to take into account changes in environmental factors and in facility characteristics and policy
- After every oil pollution incident and exercise.

Changes to phone numbers and names of those individuals identified in this contingency plan will be made on an as required and when required basis. The numbers are to be verified when the camp is opened and/or on an annual basis.

Organization

Shell Canada Limited utilizes the Incident Command System for all emergencies¹. All incident responses are modeled after the Disciplined Approach. See Section 917 of Shell's Emergency Response Plan Model for detailed guidance on the Disciplined Approach and Prioritized Response Goals.

Prioritized Response Goals

The prioritized response goals are:

- Protect Human Life (yours, fellow worker, & public)
- Protect The Environment
- Minimize Asset Loss

¹ ICS system description plus Roles & Responsibilities of all organizational positions are described in Shell's Emergency Response Manual - Model

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- Regain Steady State Operations to minimize business impact (consider both revenue & reputation)

The objectives of a spill response are:

- Safety of People, Environment, and Facilities
- Source Control
- Containment of released materials
- Recovery and Storage of released materials.

PROCEDURE

1. SAFETY

Ensure personal safety

- ◆ Ensure your own personal safety from existing and potential hazards and your fellow workers' safety.

2. ISOLATE AND DENY ENTRY

Isolate the area and deny / restrict entry

- ◆ Establish / adjust control perimeters.
- ◆ Eliminate ignition sources.

3. NOTIFICATIONS

Notify the following immediately.

- ◆ Shell's onsite supervisor
- ◆ Barge Captain

Notify the following as soon as practical.

- ◆ Shell's DAR/Construction Manager
- ◆ Northwest Territory Emergency Spill Response Line
- ◆ Regional Operations Center (ROC)
- ◆ Indian Northern Affairs Canada - requirements as per protocol in Appendix IV
- ◆ NEB - requirements as per protocol in Appendix IV and/or spill is not contained and could result in further safety property or environmental damage.

4. COMMAND / MANAGEMENT

Order depends on specific factors

- ◆ The Onsite Supervisor will assume the role of Incident Commander.
- ◆ Assign Incident Command System roles, as resources become available.
- ◆ Initiate response to incident, taking existing conditions into account.
- ◆ Ensure safety precautions and operating plans and conditions are reviewed with the crew.
- ◆ Ensure proper safe work permits are executed.

5. IDENTIFICATION AND HAZARD ASSESSMENT

Identify the Hazards and Assess the Risks

- ◆ Confirm product and determine chemical makeup of substance.
- ◆ MSDS (Material Safety Data Sheets – Chemical).
- ◆ Placards and labels (colors, markings).
- ◆ Shipping papers (Bill of Lading, waybill, etc).

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- ◆ Technical information (CANUTEC).
- ◆ Other (specialists, monitoring devices).

6. PROTECTIVE EQUIPMENT

Ensure proper personal protective equipment is utilized, and know the level of equipment available

- ◆ Fire retardant clothing, safety glasses, goggles, life jackets, gloves etc.
- ◆ Check MSDS sheets for additional requirements

7. CONTAINMENT AND CONTROL

Safe defensive containment

- ◆ If safe to do so, and if possible, stop the flow of product.
- ◆ Deploy primary and secondary booms to contain or divert spill to recovery area, as identified in plan. (Control Point at Camp Farewell and Farewell Downstream Control Point #1). Ensure that the spill is contained before starting the recovery procedure.
- ◆ Deploy absorbent pads, socks as required. Recover oiled sorbents and place them in containers.
- ◆ Use the oil skimmer to recover spilled fuel if spill is too large to recover with sorbents.
- ◆ Store recovered small volumes of oil/water mixture in steel drums.
- ◆ Store recovered large volumes of oil/water mixture in empty fuel tank for disposal at a later time.
- ◆ Notify and request assistance, if required, from external NWT Emergency Response Line.
- ◆ Place all resources/materials on standby that are available within close proximity, i.e. crawler tractor, loaders, bobcats, vacuum trucks, fuel bladders/fibreglass tanks, lost circulation material, straw bales etc.

8. DECONTAMINATION AND CLEANUP

Collect, cleanup, and sample

- ◆ Decontaminate personnel as required if exposed to the spill
- ◆ Priority is to high environmentally sensitive areas (shore lines within the Kendall Island Migratory Bird Sanctuary)
- ◆ Store the spilled material in proper containers for disposal
- ◆ Implement remediation program for the area as required
- ◆ Monitor the progress of remediation as required.

9. DISPOSAL

Dispose of wastes, contaminated clothing and equipment if unable to decontaminate.

- ◆ Consider waste impacts in all decisions
- ◆ Consider onsite incineration, movement to approved disposal sites etc

10. DOCUMENTATION

Document all actions and complete reports

- ◆ Assign a recorder to log activities
- ◆ Complete and submit a follow-up spill report to the Northwest Territories Spill Report line.

11. CONTINGENCY PLAN

Acknowledge role of federal, territorial and other bodies as identified in the National Contingency Plan

- ◆ Lead Agency for pollution incident (ship to shore) is the Canadian Coast Guard

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- ◆ Resource Agency is considered to be the Canadian Coast Guard, who will request resources as required where available.
- ◆ Environment Canada services provided by REET (Regional Environmental Emergencies Team)

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♦ SCENARIO

Fisheries and Oceans Canada - Coast Guard require an Oil Pollution Emergency Plan and Oil Pollution Incident Procedures, Equipment and Resources Scenario as required by regulation SOR/95-405. The scenario assumption is for a Level 1, category of Oil Handling Facility with a 150m³/h maximum oil transfer rate and a Level 1 category of Oil Handling Facility with a minimum spill size of 1m³. The maximum oil transfer rate at time of unloading will be 85m³/h and therefore falls within Level 1 category.

➤ Nature and amount of oil

Shell will be unloading approximately 2,000,000 litres of diesel fuel from barge. Aviation fuel is transported in drums. All equipment coming to site will be diesel powered so amount of gasoline on site is about 6 - 45-gallon drums. The most likely spill scenario is a hose leak. The volume used in this scenario for this type of spill is 2.0 m³.

➤ Type of ship being unloaded

Series 1000 barges from NTCL will deliver the diesel fuel. The maximum pump rate is 85 m³/hour. The boat has a shut-off valve located on it for emergency shutdown of the fuel. The fill line is 150mm.

➤ Tides and currents

There are no tides in this area. Current speed in this channel of the Mackenzie River is approximately 8 knots.

➤ Meteorological conditions

Unloading of fuel will take place late fall at above or near freezing conditions. Some winds may be encountered (prevailing winds are from the northwest)

➤ Environmental Sensitivities

There are no communities near Camp Farewell. The camp is located within a bird sanctuary. Whenever possible, unloading of fuel will take place in fall when most waterfowl have already left. Wildlife monitor is onsite at all times and is equipped with a firearm that can be discharged to scare away any waterfowl in vicinity if it is deemed necessary. Any requirement for long-term bird hazing will be accomplished by setting up automatic bird scare cannons as well as having the wildlife monitor patrol the channel with a boat to assist in scaring away any waterfowl.

There will be approximately 600 meters of fuel filling line. It will go from dock, across 200 meters of gradually rising ground to a hill. From there the line will go to the fuel tanks.

➤ Measures to minimize spill

The measures taken to minimize the possibility of a spill are as follows:

- Five on site, supervisory people have received the two-day "Oil Spill Containment and Recovery Training (Open Water)" course and the two-day "*Response to Oil Spills in Ice conditions*" course. Any new Supervisors will also receive the training if not already done so.

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- The Shell site supervisor for the unloading will become the Incident Commander if there is a spill.
- Hoses, connections and valves will be inspected on the fill line prior to use.
- Drip pans will be installed under each connection
- There will be quick shutting shut-off valves at each end.
- During diesel fuel filling operations, the fill line will be patrolled. There will be personnel at each shut-off valve. All personnel will be equipped with radios. In the event of a line break, the valves will be shut off immediately to minimize the spill.

➤ Training

The two-day "Oil Spill Containment and Recovery Training (Open Water)" course held in 2002 at Farewell, included classroom instruction, dry land equipment deployments and a Conventional and BoomVane deployment in the Mackenzie River.

Note: Fuel has not been unloaded at Farewell since 2002.

- Day 1

- Formal classroom training using a PowerPoint presentation and covering strategies and tactics of oil spill response
- Description of Response Management System used by Shell Canada, Camp Farewell
- Description and illustration of equipment usage.
- Safety briefing
- Dry Land deployment of equipment which gave participants hands-on experience as to how the components fitted together and operated.

- Day 2

- Briefings
 - Safety
 - Communications
 - Commander's (describing "spill" and deployments to be effected during the field deployment exercise
- Organizational Structure to be used in the field
 - Assignment to crews
 - Crew responsibilities
- Field Deployment
 - Conventional deployment of 400 feet of river boom
 - BoomVane deployment of 400 feet of river boom
- Debriefing

The two-day training courses "Oil Spill Containment and Recovery Training (Open Water)" and "Response to Oil Spills in Ice Condition" are normally held annually and

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sponsored by the Mackenzie Delta Spill Response Corporation (MDSRC) and the Aurora College.

- Training attended by various staff from the MDSRC participants, local Contractors, Inuvik Fire Department and individuals from the General Public. *Shell last participated in the open water session in 2005.*
- The sessions include components on cold weather safety, material properties in cold climates, strategies and tactics for spill containment and recovery in winter conditions and waste management requirements.
- Day1
 - Safety
 - Material Properties
 - Environmental Awareness
 - Regulatory Requirements
 - Strategies, Tactics & Equipment Waste Management Considerations.
- Day2
 - Introductions of Commander
 - Description of "Problem"
 - Safety Briefing
 - Communications Briefing
 - Assignment of Crews & duties
 - Deployment Briefing
 - Field Deployment
 - Debriefing.

➤ Training and Exercises

- Additional training and exercises are being planned by the MDSRC for subsequent years. Activity in the Mackenzie Delta will determine frequency of training required.
- Shell staff at the field location will support the trained supervisory staff in areas of labour, equipment operation and administrative duties in the event of an oil spill.
- If required, the trained MDSRC member companies and contractor staff will supplement Shell staff in a supervisory or other capacity when and where required.
- All personnel will be required to attend a Safety Briefing and Orientation prior to commencement of any activities associated with an oil spill response.

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- Prior to unloading of fuel barges, a meeting will be held to review the Oil Pollution Emergency Plan.

➤ Response Time Control and Containment

- Prior to start of unloading of diesel fuel, a boom will be, at the Captain's decision, set up around the unloading barge.
- An oil spills containment and clean up boat will be on site. This boat is from Mackenzie Delta Spill Response Corporation.
- Based on environmental regulations and the nature of the soil a berm cannot be installed along the shoreline.
- Prior to start of unloading of diesel fuel a line of 3 meter long booms will be constructed on shore ready for deployment as a primary containment. If required it will be immediately deployed.
- Prior to start of unloading of diesel fuel a line of 1.6 meter booms will be constructed on shore further downstream for deployment as a secondary containment. If required, it will be immediately deployed.
- Prior to start of unloading of diesel fuel, a meeting will be held of all participants to review the oil spill plan and their responsibilities and roles to both prevent a spill and contain and clean up a spill.
- Prior to start of unloading of diesel fuel Shell owned sorbents and skimmers will be set out and ready for use.
- Responsibility for the pre-transfer work will be the Shell "Site Supervisor".

➤ Response Time Clean up

An onsite spill control boat will commence clean up operations as soon as the spill is controlled and contained. If additional resources are required they will be obtained from the trained MDSRC member companies. This group will have equipment, material and trained staff to assist in the event of any spills. Current participation in the Mackenzie Delta Spill Response Corporation includes, but is not limited to, Anadarko, BP Canada Energy, Chevron Canada Resources, ConocoPhillips Canada, Devon Canada Corporation, EnCana, Petro-Canada and Shell Canada Ltd. If necessary, the trained contractor community will be requested to respond as well. Unless and until MDSRC is fully ready to respond to large operational spills, the Coast Guard is the default responder to be contacted in case of such a spill.

FAREWELL EMERGENCY RESPONSE PLAN**➤ Scenario Details**

The oil spill control boat will come complete with sorbents, boom, vane boom deployer and skimmers.

Time	Description	Person responsible
Pre Transfer	<ul style="list-style-type: none"> Barge booms deployed Spill Equipment readied Product, hazards & controls identified Prejob safety meeting held 	Barge Captain Incident Commander Incident Commander Incident Commander
Zero	Spill occurs & discovered <ul style="list-style-type: none"> Shut down pumps on barge Radio order to shut valves on hoses 	Barge Captain Incident commander
5 minutes	<ul style="list-style-type: none"> Closing of valves on line 	Source Control! (Personnel located at each valve)
15 minutes	<ul style="list-style-type: none"> Primary boom will be deployed. First Aid (if required) 	Spill Group Supervisor Medic
45 minutes	<ul style="list-style-type: none"> If necessary, secondary boom will be deployed 	Spill Group Supervisor
60 minutes	<ul style="list-style-type: none"> Oil spill boat will start cleaning up spill Land group will start cleaning up spill Notifications 	Spill Group Supervisor Spill Group Supervisor Incident Commander
Post Recovery	<ul style="list-style-type: none"> Follow-up notifications Decon. & Cleanup Disposal Incident Debrief Documentation 	Incident Commander

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➤ **Response Authorization**

Response will be in accordance with Shell's Emergency Response plan for Camp Farewell. The onsite *Incident Commander* will be the senior Shell Onsite Representative (or alternate) with backup as required from Calgary. The onsite Spill Group Supervisor will be selected from the trained personnel available.

➤ **Restart of unloading**

Unloading will not be restarted until the causes of the spill have been determined and remedies to prevent a similar incident are in place. The spill will either have been cleaned-up or there will be sufficient workers to clean up the spill and unload before unloading is restarted.

➤ **Oil Handling Facility Exercise Program**

- The Shell Farewell Facility consists of a small camp, maintenance shop, airstrip, tank farm with a capacity of two million litres and a designated area for storage of drilling equipment and products. All fuel is stored in tanks within secondary containment. The bulk of the fuel is received by barge and transferred via pipeline from shore to the tank farm.
- Current plans include transfer of fuel from shore to tank farm on a per annum basis providing facility is in operation, and therefore any onsite training and exercise programs will only be conducted on an annual basis prior to receiving any vessels for the purpose of fuel transfer.
- Standard operating practices are to pre-boom all vessels delivering product prior to commencing transfer. Each boom deployment activity is considered an operational drill for the purpose of this exercise program.
- The Shell Farewell Facility is not open on a continuous basis. Staff may be temporarily assigned to other operating areas until such time as Camp Farewell commences operation again. Shell Canada will make every effort to ensure personnel familiar with the facility and who have participated in the training and onsite exercises are reassigned to their previous positions.
- Training will be comprised of a management tabletop session onsite on an annual basis with the second day being devoted to an operational drill and training exercise.
- An Internal Notification Exercise will be completed during the 1st Q after start up of the Camp Farewell Facility and on an annual basis thereafter.
- An External Notification Exercise will be done on an annual basis.
- Exercises with vessels delivering fuel to the Camp Farewell Facility are an integral part of this plan and are reflected in the exercise program matrix. The Canadian Coast Guard and other outside agencies will be invited to participate.
- All exercises will be evaluated and reported on a critique facilitation and incident assessment ICS Form # 115. All discrepancies will be noted and assigned as action items. Post-exercise critiques will be filed and available for audit if so required.
- This plan will be updated with amendments reflecting changes noted during exercises.

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- Actual responses to spills of a product will be evaluated and reported, and will be considered as part of this program.
- The Oil Handling Facility Exercise Program will be conducted over a three-year period commencing on the date of compliance.
- Prior to unloading of any fuel barges, the Oil Pollution Emergency Plan will be reviewed.

➤ **Exercise Program Matrix**

Activity Description	Year 1	Year 2	Year 3
Internal Notification Exercise	During 1 st Q after start-up of facility	Annually*	Annually*
External Notification Exercise	Annually*	Annually*	Annually*
Operational Drill with Vessels and Contractors	Annually*	Annually*	Annually*
Management and Supervisory Table Top	Annually*	Annually*	Annually*
Full Scale Functional Exercise		One, over the three-year cycle	

*When the site is operational.

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Control Point Identifier:	Control Point Name: Farewell (Shell Canada Camp)	Issued: DRAFT #5 Lat. 69° 12.451 N Long. 135° 05.932' W
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Location: On the East bank of Richards Island on the middle channel of the Mackenzie River. Site is operated by Shell Canada Limited.

Land Owner/Tenant Contact: Crown/Shell Canada Limited

Distance to Confluence: 9.5 km* **Waterbody:** Mackenzie Bay, Beaufort Sea

- In this case, interpreted to be at the downstream Control Point

Next Downstream Control Point: Farewell Downstream Control Point #1 (9.5 km)

Waterway Details:

Width: 0.5 km

Bed Description: Sand and gravel

Bank Height/Slope: Steep bluffs behind beach. Vehicle ramp to camp plateau from Control Point beach.

Work Space Details:

Size & Location: Size will vary depending on river height. There will normally be sufficient workspace at most times of the year. August 2002 an area 10 m wide and 120 m long was available.

Helicopter Pad: Helicopter pad on camp plateau above site.
Helicopter fuel is normally available at this site.

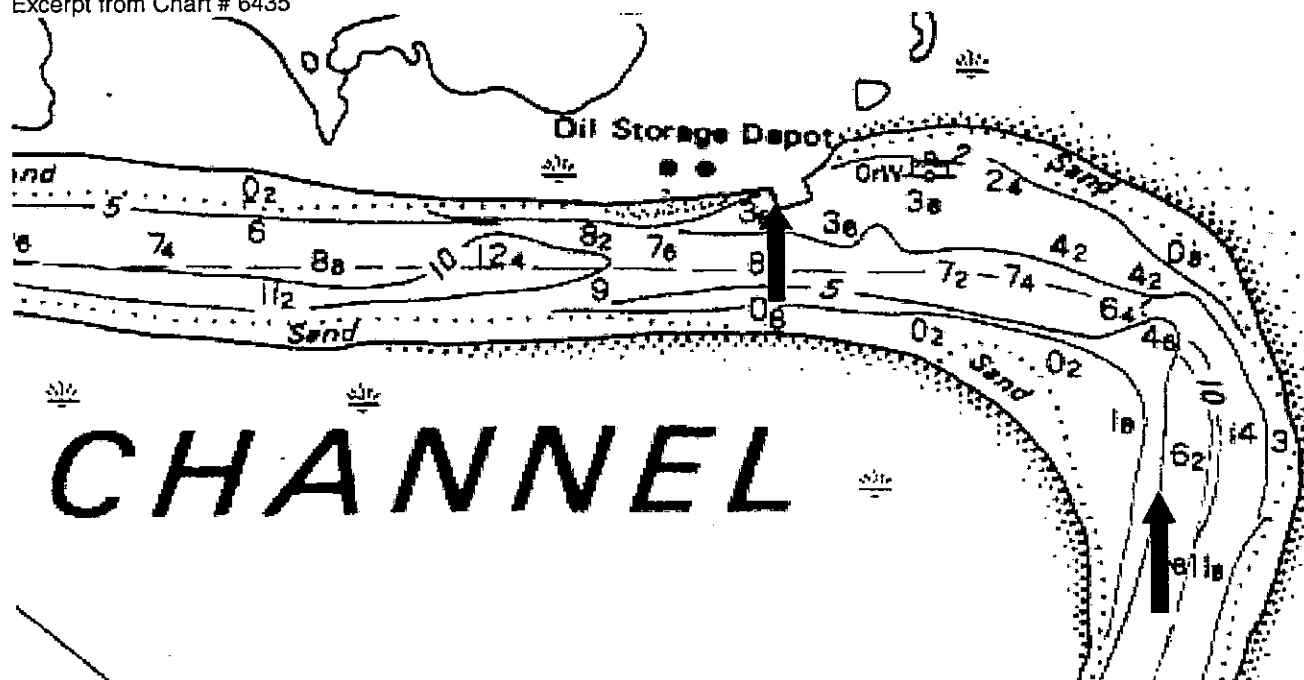
Recommended Deployment Strategy/Equipment Requirement: Boom to contain and recover at the downstream portion of the Control Point beach. 500' of boom can be deployed at most stages of river level. Deflection booms in a cascade can be deployed upstream of the site, if required. Permanent shore anchors are located at various points along the beach at this Control Point.

Other Comments: The river flow at the site is affected by tidal influences. There is a well maintained 700m gravel airstrip at this site. Survey conducted August 2002.

FAREWELL EMERGENCY RESPONSE PLAN

Control Point Identifier:	Control Point Name: Farewell (Shell Canada Camp)	Issued: DRAFT #5 Lat. 69° 12.451 N Long. 135° 05.932' W
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Excerpt from Chart # 6435



Red arrow indicates flow.

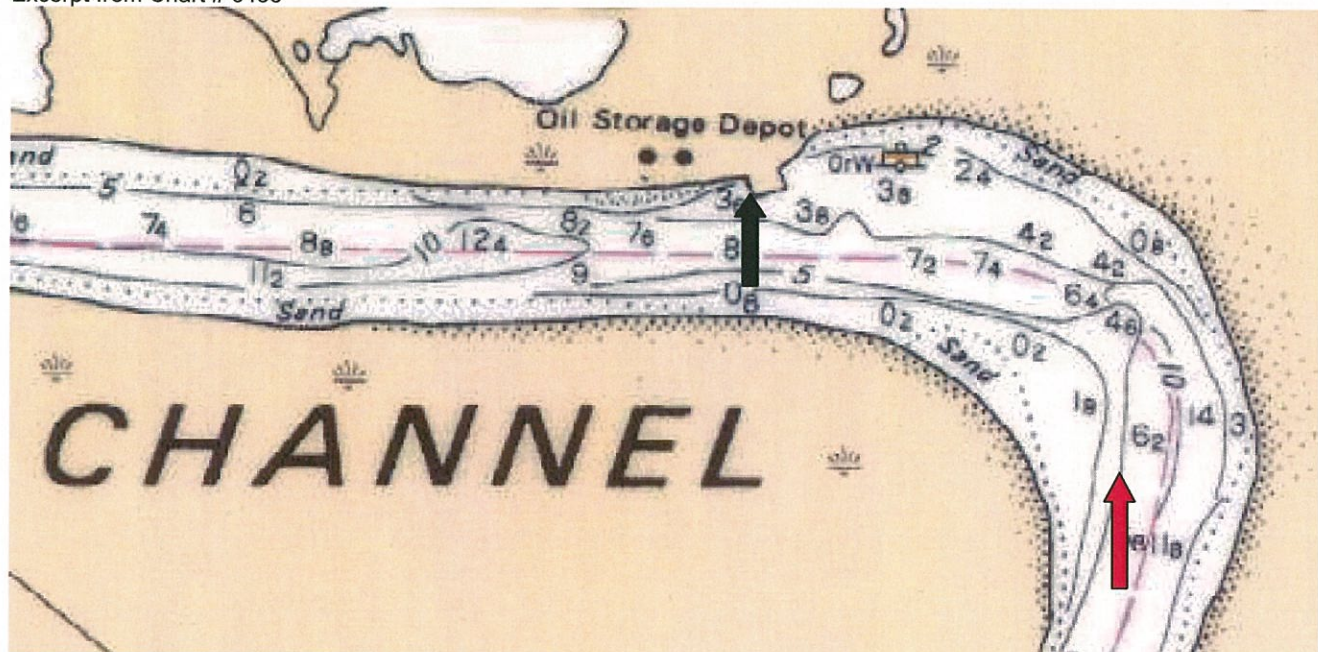
Black arrow indicates position and direction of photograph (August 2002).

Photograph below shows orange river boom on the beach at the Control Point and ramp to camp plateau.

FAREWELL EMERGENCY RESPONSE PLAN

Control Point Identifier:	Control Point Name: Farewell (Shell Canada Camp)	Issued: DRAFT #5 Lat. 69° 12.451 N Long. 135° 05.932' W
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Excerpt from Chart # 6435



Red arrow indicates flow.

Black arrow indicates position and direction of photograph (August 2002).

Photograph below shows orange river boom on the beach at the Control Point and ramp to camp plateau.

FAREWELL EMERGENCY RESPONSE PLAN



FAREWELL EMERGENCY RESPONSE PLAN

Control Point Identifier:	Control Point Name: Farewell Downstream Control Point #1	Issued: DRAFT #4 Lat. 69° 16.138' N Long. 135° 12.331 W
----------------------------------	---	--

Location: On a prominent point on the east bank of Richards Island on the middle channel of the Mackenzie River where the river widens as it flows into Mackenzie Bay.

Land Owner/Tenant Contact: Crown/ILA

Distance to Confluence: 0* **Waterbody:** Mackenzie Bay, Beaufort Sea
This Control Point is interpreted to be at the confluence.

Next Downstream Control Point: None. Open water containment and recovery or treatment would be required downstream of this location.

Waterway Details:

Width: 1 km

Bed Description: Sand and Gravel

Bank Height/Slope: Pebble and cobble beach with dense brush behind on a gently rising slope.

Work Space Details:

Size & Location: Size will vary depending on river height. There will normally be sufficient workspace at most times of the year. During August 2002 an area 10 m wide and 120 m long was available.

Helicopter Pad: A helicopter could operate from the beach, if required.

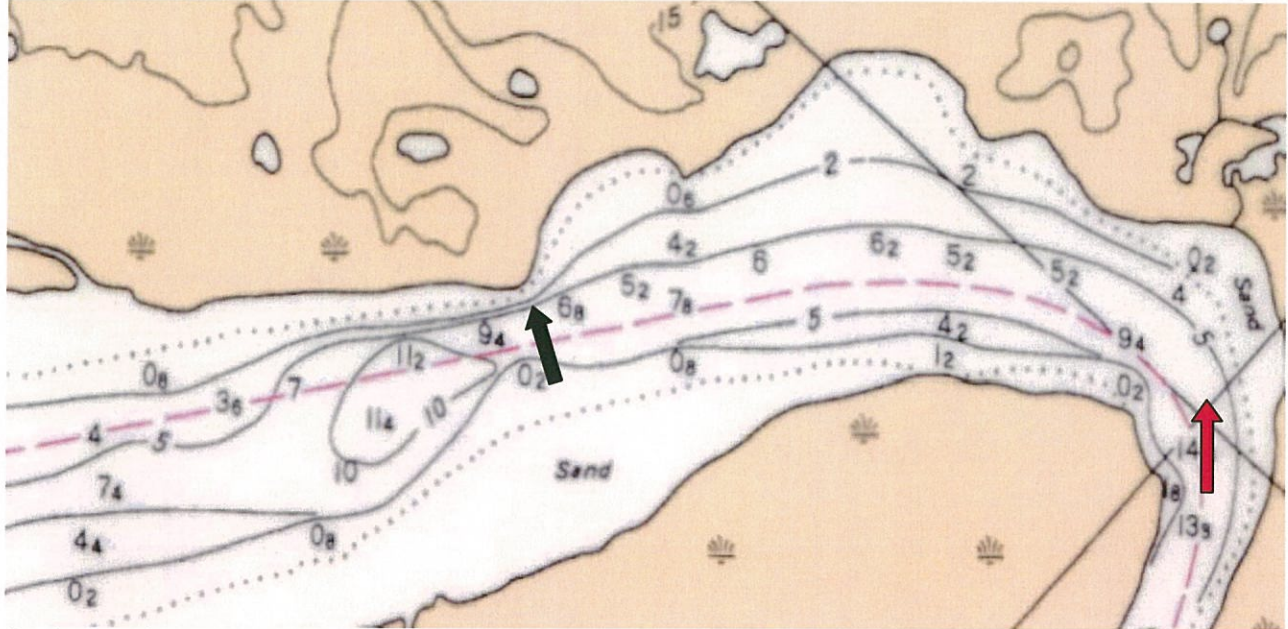
Recommended Deployment Strategy/Equipment Requirement: Boom to contain and recover spill at the point as it is swept round the upstream bay. A cascade of deflection booms could be placed to divert a spill from the main channel, if required. 500' containment boom will be required to guide spill from anchor point to beach for recovery.

Other Comments: This site is affected by tidal influences and is exposed to winds. The point on which the Control Point stands is difficult to differentiate from the one immediately upstream. This one has a 0.3 meter square white blank sign on a metal post in the bush at the back of the beach. It can be seen in the center of the photograph. This Control Point is 9.5 km downstream of Farewell, computed at river centerline. Survey conducted August 2002.

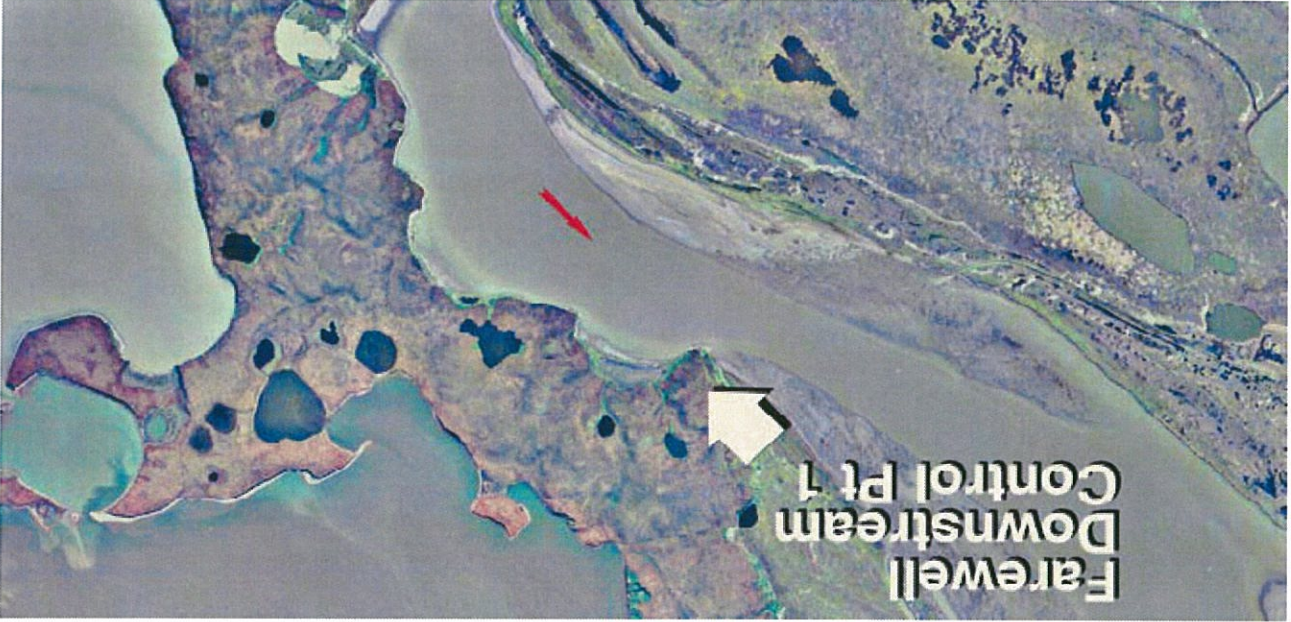
FAREWELL EMERGENCY RESPONSE PLAN

Control Point Identifier:	Control Point Name:	Issued: DRAFT #4
	Farewell Downstream Control Point #1	Lat. 69° 16.138' N Long. 135° 12.331' W

Excerpt from Chart #6435



FAREWELL EMERGENCY RESPONSE PLAN



FAREWELL EMERGENCY RESPONSE PLAN

11.6.5 Fuel Spill Emergency Response Plan (Land)

The campsite is located between a small lake and a channel of the Mackenzie River. All fuel on site is stored in tanks within secondary containment. This ERP also applies to non-fuel spills (motor oil, hydraulic oil, cooking oil etc.). A minor spill to water could develop if a land spill is not contained immediately.

Transportation

Liquid fuels will be stored in a closed system during transportation. Diesel fuel will be delivered from Camp Farewell by fuel truck. Aviation fuel will be transported in drums. All equipment coming on site will be diesel powered so amount of gasoline on site is minimal.

Maintenance and Control

This contingency plan is project specific and will be 1) reviewed & 2) updated:

- As changes to applicable environmental legislation come into effect
- Annually, to take into account changes in environmental factors and in facility characteristics and policy
- After every oil pollution incident and exercise.

Changes to phone numbers and names of those individuals identified in this contingency plan will be made on an as required and when required basis. The numbers are to be verified when the camp is opened and/or on an annual basis.

Organization

Shell Canada Limited utilizes the Incident Command System for all emergencies². All incident responses are modeled after the Disciplined Approach. See Section 917 of Shell's Emergency Response Plan Model for detailed guidance on the Disciplined Approach and Prioritized Response Goals.

Prioritized Response Goals

The prioritized response goals are:

- Protect Human Life (yours, fellow worker, & public)
- Protect The Environment
- Minimize Asset Loss
- Regain Steady State Operations to minimize business impact (consider both revenue & reputation)

The objectives of a spill response are:

- Safety of People, Environment, and Facilities
- Source Control
- Containment of released materials
- Recovery and Storage of released materials.

² ICS system description plus Roles & Responsibilities of all organizational positions are described in Shell's Emergency Response Manual - Model

FAREWELL EMERGENCY RESPONSE PLAN

PROCEDURE

1. SAFETY

Ensure personal safety

- ◆ Ensure your own personal safety from existing and potential hazards and fellow worker safety.

2. ISOLATE AND DENY ENTRY

Isolate the area and deny / restrict entry

- ◆ Utilize vehicles or barricades for temporary control.
- ◆ Establish / adjust control perimeters.

3. NOTIFICATIONS

Immediately notify the following

- ◆ Shell's onsite supervisor

Notify the following as soon as practical

- ◆ Shell's DAR/Construction Manager
- ◆ Northwest Territory Emergency Spill Response Line
- ◆ Indian Northern Affairs Canada
- ◆ Indian Northern Affairs Canada - requirements as per protocol in Appendix IV
- ◆ NEB - requirements as per protocol in Appendix IV and/or spill is not contained and could result in further safety property or environmental damage.

4. COMMAND / MANAGEMENT

Order depends on specific factors

- ◆ Assign Incident Command System roles as resources become available.
- ◆ Initiate the response to incident, taking existing conditions into account.
- ◆ Ensure safety precautions and operating plans and conditions are reviewed with the crew.
- ◆ Determine a need for roadblocks.
- ◆ Ensure proper permits are executed.

5. IDENTIFICATION AND HAZARD ASSESSMENT

Identify the Hazards and Assess the Risks

- ◆ Determine chemical makeup of substance (i.e.: WHMIS, TDG Placards, PIN Nos.).
- ◆ MSDS (Material Safety Data Sheets – Chemical).
- ◆ Placards and labels (colors, markings).
- ◆ Shipping papers (Bill of Lading, Way Bill, etc).
- ◆ Technical information (CANUTEC).
- ◆ Other (specialists, monitoring devices).

6. PROTECTIVE EQUIPMENT

Ensure proper personal protective equipment is utilized, and know the level of equipment available

- ◆ Fire retardant clothing, safety glasses, goggles, life jackets, gloves etc.
- ◆ Check MSDS sheets for additional requirements

7. CONTAINMENT AND CONTROL

Safe defensive containment

- ◆ If safe to do so, and if possible, stop the flow of material.

FAREWELL EMERGENCY RESPONSE PLAN

- ◆ Ensure that flow is contained before starting the recovery procedure.
- ◆ Construct dikes, dams or drainage trenches to limit size of spill and prevent fuel from migrating. Contain as close to source as safe and practical to do
- ◆ In winter, areas are usually snow covered so spill areas are easily seen. Build dikes using plastic sheeting to line face of dike. Use mechanical and hand equipment to scrape up snow/liquid mixture and place it in containers.
- ◆ See list of emergency spill cleanup equipment for clean up materials
- ◆ Isolate (deny entry via keeping safe distance from spilled material).
- ◆ Divert, disperse, dilute cover
- ◆ Pump as much liquid product as possible into empty drums or tanks for disposal.
- ◆ Deploy absorbent pads, socks as required.
- ◆ Recover oiled sorbents and place them in steel drums for burning in onsite incinerator. Sorbents should be incinerated as soon as possible to avoid spontaneous combustion.
- ◆ Immediate burning may be required to prevent the spread of fuel into water courses. If burning done, pick up the residue after-burn.
- ◆ Notify and request assistance, if required, from external NWT Emergency Response Line.
- ◆ Place all resources/materials on standby that are available within close proximity, i.e. crawler tractor, loaders, bobcats, vacuum trucks, fuel bladders/fibreglass tanks, lost circulation material, straw bales etc.

8. DECONTAMINATION AND CLEANUP**Collect, cleanup, and sample**

- ◆ Decontaminate personnel as required if exposed to the spill
- ◆ Priority is to high environmentally sensitive areas (municipality water sources, waterfowl staging areas, domestic fishing areas).
- ◆ Store the spilled material in proper containers for disposal;
- ◆ Implement remediation program for the area, as required
- ◆ Collect and analyze soil samples from the remaining spill area, if required
- ◆ Monitor the progress of remediation as required.

9. DISPOSAL**Dispose of wastes, contaminated clothing and equipment if unable to decontaminate.**

- ◆ Consider waste impacts in all decisions
- ◆ Remove the contaminated material and haul to an approved disposal site.

10. DOCUMENTATION**Document all actions and complete reports**

- ◆ Assign a recorder to log activities
- ◆ Complete and submit a follow-up spill report to the Northwest Territories Spill Report line.

FAREWELL EMERGENCY RESPONSE PLAN**11.6.6 Fuel/Oil Spill Emergency Response Plan (Ice)**

The campsite is located between a small lake and a channel of the Mackenzie River. All fuel on site is stored in tanks within secondary containment. This ERP also applies to non-fuel spills (motor oil, hydraulic oil, cooking oil etc.). Spills on or under ice are most likely to occur during transport or due to vehicle or equipment falling through the ice.

Transportation

Liquid fuels will be stored in a closed system during transportation. Diesel fuel will be delivered from Camp Farewell by fuel truck. Aviation fuel will be transported in drums. All equipment coming on site will be diesel powered so amount of gasoline on site is minimal.

Maintenance and Control

This contingency plan is project specific and will be 1) reviewed & 2) updated:

- As changes to applicable environmental legislation come into effect
- Annually, to take into account changes in environmental factors and in facility characteristics and policy
- After every oil pollution incident and exercise.

Changes to phone numbers and names of those individuals identified in this contingency plan will be made on an as required and when required basis. The numbers are to be verified when the camp is opened and/or on an annual basis.

Organization

Shell Canada Limited utilizes the Incident Command System for all emergencies³. All incident responses are modeled after the Disciplined Approach. See Section 917 of Shell's Emergency Response Plan Model for detailed guidance on the Disciplined Approach and Prioritized Response Goals.

Prioritized Response Goals

The prioritized response goals are:

- Protect Human Life (yours, fellow worker, & public)
- Protect The Environment
- Minimize Asset Loss
- Regain Steady State Operations to minimize business impact (consider both revenue & reputation)

The objectives of a spill response are:

- Safety of People, Environment, and Facilities
- Source Control
- Containment of released materials
- Recovery and Storage of released materials.

³ ICS system description plus Roles & Responsibilities of all organizational positions are described in Shell's Emergency Response Manual - Model

FAREWELL EMERGENCY RESPONSE PLAN

PROCEDURE**1. SAFETY****Ensure personal safety**

- ◆ Ensure your own personal safety from existing and potential hazards and fellow worker safety.

2. ISOLATE AND DENY ENTRY**Isolate the area and deny / restrict entry**

- ◆ Utilize vehicles or barricades for temporary control.
- ◆ Establish / adjust control perimeters.

3. NOTIFICATIONS**Immediately notify the following**

- ◆ Shell's onsite supervisor

Notify the following as soon as practical

- ◆ Shell's DAR/Construction Manager
- ◆ Northwest Territory Emergency Spill Response Line
- ◆ Indian Northern Affairs Canada - requirements as per protocol in Appendix IV
- ◆ NEB - requirements as per protocol in Appendix IV and/or spill is not contained and could result in further safety property or environmental damage.

4. COMMAND / MANAGEMENT**Order depends on specific factors**

- ◆ Assign Incident Command System roles as resources become available.
- ◆ Initiate the response to incident, taking existing conditions into account.
- ◆ Ensure safety precautions and operating plans and conditions are reviewed with the crew.
- ◆ Determine a need for roadblocks.
- ◆ Ensure proper permits are executed.

5. IDENTIFICATION AND HAZARD ASSESSMENT**Identify the Hazards and Assess the Risks**

- ◆ Determine chemical makeup of substance (i.e.: WHMIS, TDG Placards, PIN Nos.).
- ◆ MSDS (Material Safety Data Sheets – Chemical).
- ◆ Placards and labels (colors, markings).
- ◆ Shipping papers (Bill of Lading, Way Bill, etc).
- ◆ Technical information (CANUTEC).
- ◆ Other (specialists, monitoring devices).

6. PROTECTIVE EQUIPMENT**Ensure proper personal protective equipment is utilized, and know the level of equipment available**

- ◆ Fire retardant clothing, safety glasses, goggles, life jackets, gloves etc.
- ◆ Check MSDS sheets for additional requirements

7. CONTAINMENT AND CONTROL**Safe defensive containment**

- ◆ If safe to do so, and if possible, stop the flow of material.
- ◆ Ensure that flow is contained before starting the recovery procedure.

FAREWELL EMERGENCY RESPONSE PLAN

- ◆ Construct snow/ice dikes dams to limit size of spill and prevent fuel from migrating. Contain as close to source as safe and practical to do
- ◆ In winter, areas are usually snow covered so spill areas are easily seen. Build dikes using plastic sheeting to line face of dike. Use mechanical and hand equipment to scrape up snow/liquid mixture and place it in containers.
- ◆ See list of emergency spill cleanup equipment for clean up materials
- ◆ Isolate (deny entry via keeping safe distance from spilled material).
- ◆ Pump as much liquid product as possible into vacuum trucks, empty drums or tanks for disposal.
- ◆ Deploy absorbent pads, socks as required.
- ◆ Recover oiled sorbents and place them in steel drums for disposal or burning in onsite incinerator. Sorbents should be incinerated as soon as possible to avoid spontaneous combustion.
- ◆ Scrape up all contaminated ice.
- ◆ Notify and request assistance, if required, from external NWT Emergency Response Line.
- ◆ Place all resources/materials on standby that are available within close proximity, i.e. crawler tractor, loaders, bobcats, vacuum trucks, fuel bladders/fibreglass tanks, lost circulation material, straw bales etc.

8. DECONTAMINATION AND CLEANUP**Collect, cleanup, and sample**

- ◆ Decontaminate personnel as required if exposed to the spill
- ◆ Priority is to high environmentally sensitive areas (municipality water sources, waterfowl staging areas, domestic fishing areas).
- ◆ Store the spilled material in proper containers for disposal;
- ◆ Collect and analyze soil samples from the remaining spill area, if required
- ◆ Monitor the progress of remediation as required.

9. DISPOSAL**Dispose of wastes, contaminated clothing and equipment if unable to decontaminate.**

- ◆ Consider waste impacts in all decisions
- ◆ Remove the contaminated material and haul to an approved disposal site.

10. DOCUMENTATION**Document all actions and complete reports**

- ◆ Assign a recorder to log activities
- ◆ Complete and submit a follow-up spill report to the Northwest Territories Spill Report line.

FAREWELL EMERGENCY RESPONSE PLAN

Spills in Broken Ice

Like all spill response, this very much depends on the conditions at the time of the event.

Consideration should be given to in-situ burning. It is a severe risk to personnel safety risk attempting to contain and recover a spill in what can be a very dangerous environment. Regulatory approval will be required for in-situ burning.

Prior to ignition, conduct a thorough review of what resources could be at risk from a resulting fire. Position emergency personnel and equipment to respond to protect those resources.

If operating from shore or a secure location on the ice, a skimmer may be used to recover the spill.

Spills Under Ice

Oil under ice will attempt to follow the fastest river flows, which occur in the deepest sections of the river. Reference to a navigation chart for the river downstream of the spill site will show the location of the deep channel.

The fastest way to determine the progress of the oil under the ice is to auger holes and look for a sheen rising.

Note that as soon as the ice is penetrated this will also permit gases to escape from the oil.

The aim is to get sufficiently ahead of the oil that equipment can be staged at the site, an ice slot can be dug and, if necessary, wooden deflector walls installed prior to the arrival of the spill.

The ice slot creates an area for the spill to rise to the water surface and be retained there for recovery or, in some cases, ignition. The deflector walls are usually made of plywood sheets that stick down into the river through the ice and deflect the oil towards the slot for recovery. They serve the same purpose under the ice as deflection booms do in open water deployments.

The slot will be placed at an angle across the channel or part of the channel that the spill is expected to run through. 30° to the current flow is an optimum angle. The slot length will usually be that of the distance across the deep channel. The slot width may vary but is usually dictated by the width of the skimmer to be inserted at the downstream end. The surfaced oil will be carried to the downstream end of the slot by the water flow.

Oil Recovery

Oil may be recovered in several ways or a combination of methods. If conditions permit, a vacuum truck can skim the surfaced oil.

In good quality ice of 1 meter thickness there should be no difficulty cutting the slot wide enough to accommodate the MDSRC Canadyne Model 1230 /1 Multi Skimmer (1.22m) at the downstream end. This skimmer has a recovery capacity in excess of 20 cubic meters of oil per hour.

FAREWELL EMERGENCY RESPONSE PLAN

The MDSRC Aquaguard Model 40D rope mop skimmer is capable of recovering up to 4.5 cubic meters and hour. The rope mop can be placed to operate in long arm of the slot.

The MDSRC Morris MI-30 disc skimmer can also be utilized. It has a maximum recovery capacity of 30 cubic meters per hour. It may be placed at the funnel mouth end of the slot.

The following steps are taken to result in an ice deployment:

- Perform Ice Safety Assessment
- Deploy ice rescue crew/package
- Perform Ice Deployment Survey (Use Form shown in this Chapter) Ice auger and stream speed meter will be required
- Determine location, angle, length and width of slot
- Mark slot outline on ice
- Compute required size of ice blocks to be pulled from slot
- Mark block outlines on ice in the slot
- Auger a hole through the centre of each block to the water below the ice
- Cut slot outline
- Cut each block
- Pull blocks from slot using "T" bar and chain, starting at downstream end of slot. Spread withdrawn blocks if on ice storage area to prevent stressing ice.
- A skimmer may be installed at the downstream slot end as soon as space is available. This speed the commencement of recovery operations
- Determine the location, angle & length of deflector walls
- Install deflector walls

Tips

- Plywood may be used to cover the length of the slot in extremely cold weather that causes the slot to refreeze.
- Recovery hoses should be held above the ice surface by blocks of wood as this helps prevent the liquid in the hoses from freezing
- All equipment fuelling should be performed at a designated fuelling station prepared to prevent and capture any spill or leak.

FAREWELL EMERGENCY RESPONSE PLAN**River Ice Deployment Survey**

Date _____ Time _____ Name _____

Control Point # _____

Upstream

Holes 1 - 4

Holes 5 - 8

Holes 9 - 12

Holes 13 - 16

Width _____

Cross-sections
Sketch Width Variances

Hole #	1	2	3	4
Ice thickness (cm)				
Water depth (cm)				
Speed @ 10 cm below ice				

Hole #	5	6	7	8
Ice thickness (cm)				
Water depth (cm)				
Speed @ 10 cm below ice				

Hole #	9	10	11	12
Ice thickness (cm)				
Water depth (cm)				
Speed @ 10 cm below ice				

Hole #	13	14	15	16
Ice thickness (cm)				
Water depth (cm)				
Speed @ 10 cm below ice				

FAREWELL EMERGENCY RESPONSE PLAN

11.6.7 Mackenzie Delta Spill Response Corporation (MDSRC)

The Mackenzie Delta Spill Response Corporation is a non-profit organization operating within the Mackenzie Delta to protect the environment by providing spill preparedness and safe, effective response services to Member Companies.

For more detailed response tactics and execution techniques, consult the MDSRC Spill Response Plan (in development at time of writing).

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

11.7 TRANSPORTATION RELATED EMERGENCIES

11.7.1 Emergency Response Procedure (Transportation Related Emergency) Automotive	Procedure: 1. Ensure personal safety 2. Call for help <ul style="list-style-type: none"> • use others involved • warn oncoming traffic 3. Notifications <ul style="list-style-type: none"> • ambulance if required • local police (if damage over \$1,000.00) • supervisor 4. Fill out the shell automotive accident report form carried in all shell vehicles 5. Do not <ul style="list-style-type: none"> • admit fault or accept liability • make settlements • argue about the accident
11.7.2 Aircraft	Procedure: 1. Consider an aircraft overdue when reported as such by Air Traffic Control (ATC) or the affected Shell destination when no information is received from it or about it. <ul style="list-style-type: none"> • 30 minutes after its last notified estimated time of arrival (ETA) • 15 minutes after the estimated time of landing, after having received landing clearance or landing information • 15 minutes after takeoff 2. There can be two phases of response to an overdue aircraft <ul style="list-style-type: none"> • uncertainty - attempt to make contact or to find • alert - missing aircraft 3. An aircraft is considered missing when its position is unknown and with the supply of fuel carried, it can no longer be airborne.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

11.8 EXTERNAL / CIVIL DISTURBANCES

11.8.1 Emergency Response Procedure (External / Civil Disturbance)

Note: Activities or hazards outside of your area of influence could result in an emergency situation requiring response. Examples include

- nearby industry
- transportation accident with spill or fire
- sabotage
- non work related accident of injury
- civil disturbances / actions

Procedure:

1. Ensure personnel safety
2. Confirm situation and location
3. Isolate and deny entry to site
4. Notifications
 - supervisor
 - police
 - onsite personnel
5. Initiate incident command system (ICS)
 - develop an action plan
 - shutdown equipment as deemed necessary in an organized safe manor
 - evacuate to a safe muster area, ensure everyone is accounted for
 - monitor and assist
 - resume operation when it is safe to do so

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

12.0 CLASSIFICATION OF AN INCIDENT

12.1 Purpose

Classifying an incident provides a common understanding by Company, Industry and Government Agencies as to the severity of the incident and its potential impact on People, Property, Environment and Reputation. It is important that the Incident Commander (IC) determine the Level of Incident and its potential Level if it escalates. The Levels need to be adjusted depending on the emergency situation/status.

When the On site Shell Representative is unsure of the situation, then communication should take place with the Office Based Superintendent / Supervisor to determine the Level of Incident.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**12.2 Classification Matrix**

		INCIDENTS		
RISK	ALERT	LEVEL 1: LOW	LEVEL 2: MEDIUM	LEVEL 3: HIGH
IMPACT				
Worker Safety	Near Miss	People Actual severity consequence 2 on the RAM	Multiple worker injury an/or life threatening worker injury People Actual severity consequence 3 on the RAM	Worker fatality - Actual severity consequence 4 to 5 on the RAM
Public Safety	Onsite event only. No risk to public but public has a perception that they are at risk.	Onsite, with possible impact off-site Reputation Actual or Potential severity consequence 2 on the RAM	Onsite, with possible impact off-site Reputation Actual or Potential severity consequence 3 on the RAM	Potential for public safety to be jeopardized Reputation Actual or Potential severity consequence 4 to 5 on the RAM
Environmental	Onsite event only	Onsite, with possible impact off-site Environmental Actual severity consequence 2 on the RAM	Onsite, with possible impact off-site Environmental Actual severity consequence 3 on the RAM	Onsite, with significant off-site Environmental Actual severity consequence 4 to 5 on the RAM / Long term
TYPES OF INCIDENTS				
Fire / Explosion	Small gas leak or fuel spill that can be immediately contained.	Gas or fuel leak with some risk of fire.	Contained equipment fire (i.e., camp, trailers or rig equipment), no risk to life.	Major equipment / rig fire and or explosion.
Camp Fire	Potential of camp fire, false fire alarms, electrical problems in	Refuse, fuel, dry vegetation or other material out of control	Contained camp fire	Major camp fire or explosion

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

	the fire system	around the camp		
Hazardous Spill (chemicals, hydrocarbons or produced water)	Spill but within a containment system No hazard of fire	Onsite spill but outside containment system	Spill migrates off-site and or potential of fire and or explosion	Off-site sensitive environment (ie. wildlife wet lands, river or water body)
Transportation of Dangerous Goods (TDG)	TDG violation warning (no ticket issued)	TDG violation / accident, no damage to container and no product release	Accident with damage to container with potential of failure and/or fuel spill to sensitive area	Accident with fire and/or significant loss of product in sensitive area
Natural Event				
Severe Weather	Severe weather warning of area.	Travel becomes hazardous / potential for worker injury.	Restriction on travel / potential for worker injury.	No visibility, roads are impassable, significant build up of ice in equipment
External Events				
Sabotage	Targeting industry in the area.	Unconfirmed.	Onsite damage.	Sever damage that disrupts the safety of the operations.
Bomb Threat	Targeting industry in the area.	Unsubstantiated threat.	Credible threats.	Explosive located onsite and/or has detonated.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**12.3 Action Plan Checklist**

	LEVEL 1: LOW	LEVEL 2: MEDIUM	LEVEL 3: HIGH
Incident Commander (IC) Onsite Shell Representative	<input type="checkbox"/> Activate Site Specific ERP <input type="checkbox"/> Alert the Office Based Superintendent/Supervisor or Operations Manager who will: <ul style="list-style-type: none"> • Consider proceeding to the worksite • Mobilize Sr. Construction Foreman (if not on site) and HSE Team Leader • Alert the Manager WA&SO and E&P Crisis Manager as needed. <input type="checkbox"/> Establish an Incident Command Post <input type="checkbox"/> Establish initial Staging Area <input type="checkbox"/> Notify local regulators (INAC, WCB, etc) <input type="checkbox"/> Alert / Stand by: <ul style="list-style-type: none"> • Aircraft Support • Fire Services • MDSRC if required • Emergency Medical Services 	<input type="checkbox"/> Relocate Incident Command Post if req'd. <input type="checkbox"/> Establish / relocate Staging Area <input type="checkbox"/> Mobilize to rescue and or treat injured personnel <ul style="list-style-type: none"> • Dispatch medic • Establish triage area <input type="checkbox"/> Order additional communication equipment if req'd <input type="checkbox"/> Mobilize resources to the Staging Area: <ul style="list-style-type: none"> • Additional personnel from local contractors • Fire services (if required) • Spill equipment (if required) • Emergency Medical Services (EMS – if required) <input type="checkbox"/> Dispatch manpower and equipment from Staging Area <input type="checkbox"/> Up-date <ul style="list-style-type: none"> • Discuss if fan-out is required to other government / local agencies <ul style="list-style-type: none"> • INAC • ROC • WCB • INAC • DFO • RCMP • Environment Canada • E&P Crisis Manager 	<input type="checkbox"/> Establish road blocks <input type="checkbox"/> Notify public (as required) <input type="checkbox"/> Activate Corporate EOC (if required) <input type="checkbox"/> Up-date <ul style="list-style-type: none"> • INAC • ROC • WCB • INAC • DFO • RCMP • Environment Canada • E&P Crisis Manager

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

APPENDICES

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**Appendix I TRANSPORTATION & MEDIVAC PLAN**

EMERGENCY NUMBERS	Preferred hospital: Inuvik Hospital Number: (867) 777- 8161 Emergency (867) 777-8000 Switchboard Preferred Ambulance: Inuvik Ambulance Emergency Number: (867) 777-4444 Preferred Police: RCMP Number: (867) 777-1111 Preferred Air :Evacuation Canadian Helicopters Number 867 777-2424 867 678-0091 Alternate Air: Aklak Air Number 867 777-3777 Office Hours 867 777-3555 24hr
GENERAL INFORMATION Note- If travel distance to Health care facility is: CLOSE (< 20 min.) or DISTANT (20 min to 40 min) You may rely on ambulance service from that Health care facility, <u>HOWEVER</u> , if the travel distance of the worksite is greater then 40 min, then it is deemed: ISOLATED (>40 min) Therefore, you shall have transportation that meets the following criteria: <ul style="list-style-type: none"> • Clean • Protects from weather • Equipped with communication • Accommodate a 200 cm stretcher HELICOPTER RESPONSE TIME WILL QUALIFY	Type of accident likely to occur: Lacerations, Slips/Trips/Falls Number of workers at site: 15 - 35 Distance from a Health Care Facility: greater than 40 min Availability of Ambulance Service: Air evacuation Ambulance emergency response time: Approximately 40min Time of day work is in progress: Day-time Type of transportation needed to get to the worksite: Helicopter or fixed wing Route to site: Flying 110km Northwest of Inuvik Lat: 69 12 35.09 Long: 135 06 17.286 Does change in weather effect type of travel? Explain. Increase time by: Depends upon weather. Could be next day.
CONTACTS: LOCATION OF PHONES AND RADIOS	<ul style="list-style-type: none"> • phones located in offices • hallway • radios on specific personnel • radios in office • specific personnel have cell phones
EMERGENCY CALL RESPONSIBILITY	Primary responsibility: Medic Secondary responsibility: Shell Site Supervisor Site phone number: 867 777- 867 777- Radio Frequency: Receive: _____ Transmit: _____ Air to Ground Frequency: 130.275 MHz
INFORMATION YOU NEED TO	CALL AIR EVACUATION CHARTER

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

HAVE	<p>Tell them</p> <ul style="list-style-type: none"> • Medivac required • Your location –Camp Farewell Lat: 69 12 35.09 Long: 135 06 17.286 • Landing (airstrip) condition include lighting, wind speed, wind direction and local weather conditions • Any obstructions or hazards to be aware of in landing • Phone numbers of camp • Radio frequencies of camp • Upon contact to charter, medical contact is mandatory to ensure that proper facilities and attention is given to patient(s). • Number of injured: • Extent of injuries: • What is being done (patient talking, seated, no response, etc): • Obtain confidential medical file to accompany patient <p><u>CALL TO HOSPITAL AND AMBULANCE</u></p> <p>If available and possible, medic shall call the local hospital and ambulance</p> <p>Tell them</p> <ul style="list-style-type: none"> • Medivac in progress and that evacuation charter has been notified • Number of injured: • Extent of injuries: • What is being done (patient talking, seated, no response, etc) • Age, sex of patient • Brief description of accident • Description of injuries or illness • Medic position and qualifications • Type of medical aid already administered • Site phone number • Estimated time of arrival:
EXPECTATIONS	<p>What the paramedic should expect when he arrives on site:</p> <p>_____</p> <p>_____</p> <p style="text-align: center;">OR</p> <p>What you can expect when the conveyance vehicle arrives:</p> <p>_____</p> <p>_____</p>
COMMUNICATION OF PLAN	<p><u>FIRST AIDERS ON SITE</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>All workers on site as part of orientation</p>

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**Appendix II PERSONAL MEDICAL INFORMATION SHEET**

THE INFORMATION BELOW IS CONFIDENTIAL - TO BE VIEWED BY MEDICAL PERSONNEL ONLY
 EMPLOYER: _____ POSITION: _____

NAME: _____ DATE: _____

ADDRESS: _____

PHONE NO.: () _____ OR () _____

BIRTHDATE: _____ AGE _____ HEIGHT: _____ WEIGHT: _____

HEALTH CARE NUMBER: _____ PROVINCE: _____

FAMILY DOCTOR: _____ CITY: _____

MEDICAL HISTORY**ARE YOU TAKING MEDICATION FOR THE FOLLOWING?**

☐ Diabetes ☐ Asthma ☐ Epilepsy ☐ High Blood Pressure
☐ Angina ☐ Thyroid ☐ Heart Disease

Allergies to Penicillin? ☐ Yes ☐ No ☐ Other Drugs _____

Do you suffer from allergies ☐ Yes ☐ No If so, explain _____

Do you have other medical problems not listed above? _____

Have you had a tetanus shot in the past five years? ☐ Yes ☐ No

Do you wear Glasses? ☐ Yes ☐ No Contact Lenses? ☐ Yes ☐ No Dentures? ☐ Yes ☐ No

Do you have any medical problems, disabilities or previous injuries that may affect your ability to conduct your job in a safe efficient manner? ☐ Yes ☐ No

If Yes please explain: _____

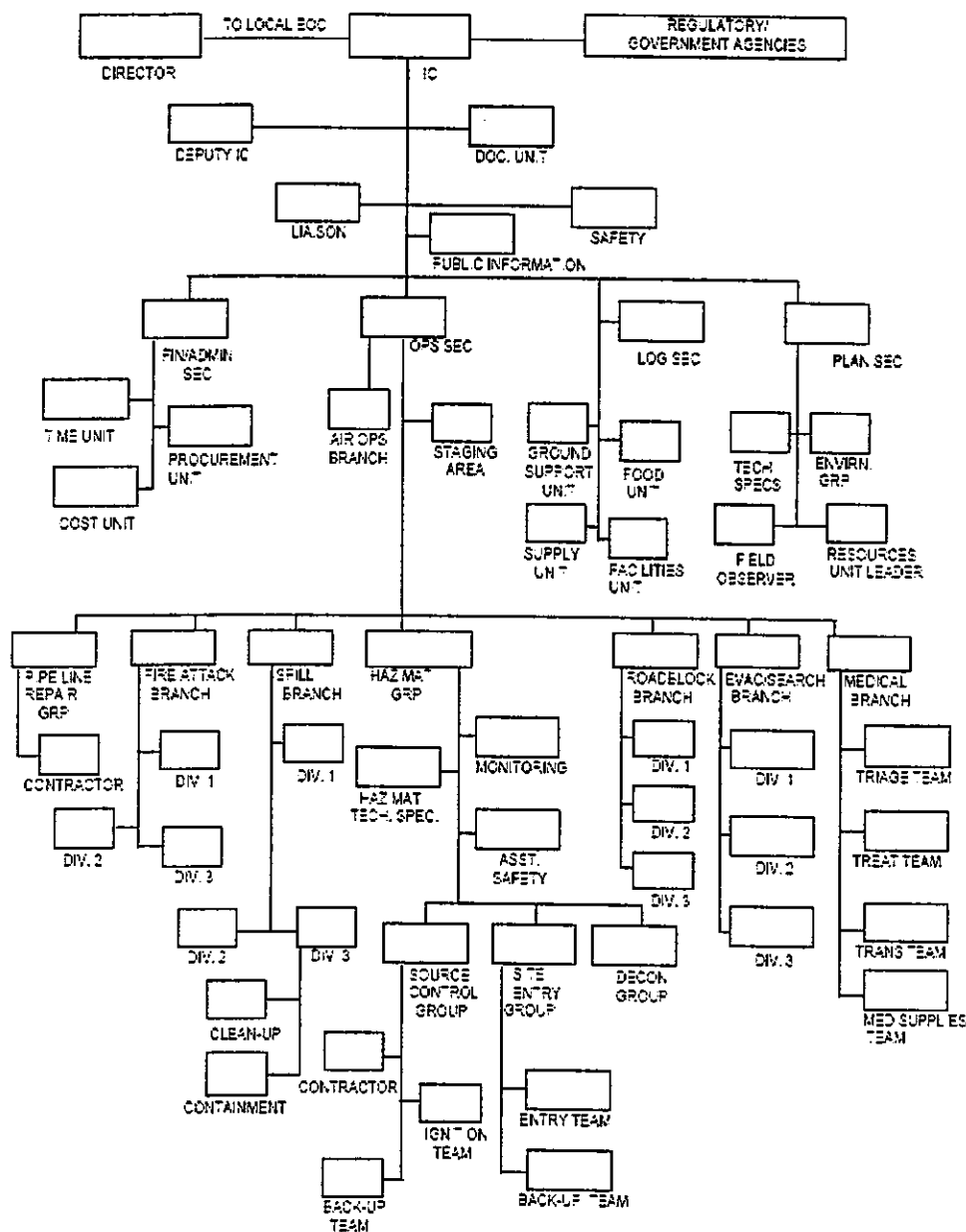
EMERGENCY CONTACT NUMBERS

Name: _____ Relationship: _____

Address: _____

Phone Number: () _____ Cell Number: () _____

Employee Signature _____	This form is to be used only in an emergency. By signing you are authorizing this information to be released to medical personnel.
--------------------------	--

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**Appendix III FIELD BASED INCIDENT COMMAND POST****COMPOSITE ORGANIZATION CHART - INCIDENT COMMAND POST (ICP)****KEY**

- Dotted lines represent communications/support information
- Solid lines represent organizational authority

SEC = Section
GRF SPUR = Group Supervisor
LDR = Leader

Note:

- This is not mandatory to assign all positions.
- Assign positions only as necessary.
- Some positions may not require activation depending on the actual emergency.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**Appendix IV NWT SPILL REPORT FORM & PROTOCOLS**

See .pdf version for full size form

**NWT SPILL REPORT**

(Oil, Gas, Hazardous Chemicals or other Materials)

24-Hour Report Line

Phone: (867) 920-8130

Fax: (867) 873-6924

A Report Date and time		B Date and time of Spill (if known)		C <input type="checkbox"/> Original Report <input type="checkbox"/> Update No		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? <input type="checkbox"/> yes <input type="checkbox"/> no		I If spill is continuing, give estimated rate		J Is further spillage possible? <input type="checkbox"/> yes <input type="checkbox"/> no		K Extent of contaminated area (in sq. m if possible)	
L Factors affecting spill or recovery (weather conditions, terrain, snow cover, etc.)				M Containment (natural depression, dyke, etc.)			
N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials							
O Do you require assistance? <input type="checkbox"/> no <input type="checkbox"/> yes . describe*				P Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife*			
Q Comments and/or recommendations *:						FOR SPILL LINE USE ONLY	
						Lead Agency	
						Spill significance	
						Lead Agency contact and time	
						Is this file now closed? <input type="checkbox"/> yes <input type="checkbox"/> no	
Reported by:		Position, Employer, Location			Telephone No:		
Reported to:		Position, Employer, Location			Telephone No:		

*Put additional comments on next page (Please type in the Box letter you are referring to in your comments)



Indian and Northern
Affairs Canada
www.inac.gc.ca

Affaires indiennes
et du Nord Canada
www.ainc.gc.ca

Your file - Votre référence

Our file - Notre référence

December 17, 2003

Oil and Gas Exploration and Production Companies
Operating in the Northwest Territories and Nunavut

INAC Spill Reporting Protocol for Upstream Oil and Gas Operations

The Northwest Territories/Nunavut Spills working Agreement (revised 2003) does not specify what quantity of a substance would trigger a requirement to report a spill, largely because there are seven signatories to the Agreement who have different spill reporting requirements.

Recently, the National Energy Board (NEB) developed a Spill Reporting Protocol for NEB lead spills in the NWT/Nunavut (see attached letter). The purpose of the revised upstream oil and gas spill reporting protocol is to:

- more closely align spill reporting requirements with reporting requirements of other jurisdictions such as the territorial governments;
- focus spill notification and follow-up on spills that have potential to be a threat to the environment; and
- minimize the number of spill reports of low volume and areal extent that can be immediately and adequately dealt with by the operator and have minimal or no potential to be a threat to the environment.

The NEB spill reporting protocol came into effect on 15 July 2003 for well drilling and production operations where the NEB is the lead agency for that spill. At that time, Indian and Northern Affairs Canada had adopted the NEB protocol for INAC lead spills for oil and gas operations including well drilling where the NEB is not the lead agency and seismic operations. The conditions outlined in Appendix A of the NEB protocol must be met prior to the operator being permitted to use this protocol.

Effective immediately, the following conditions are added to the Appendix A of the protocol for INAC lead spills:

- An on-site record shall be kept of all minor spills and immediately reportable spills and be readily available to INAC Inspectors or officials upon request;
- Monthly reporting of all minor spills shall be reported to the District INAC Inspector(s) in the condensed form attached;
- All spills requiring assistance by the operator (i.e. not cleaned up immediately and assistance is required for cleanup), continuing spills, or in situations where further spillage is possible are to be reported immediately;

Canada

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- All spills, irregardless of size (areal extent), amount, and product, remain the liability of the proponent and must be cleaned up immediately. All INAC lead spills must be cleaned up to the satisfaction of the INAC Inspector.

Please review the attached and if you wish to take advantage of this protocol, please contact Robert Jenkins at (867) 669-2574.

Sincerely,



David Milburn
Manager, Water Resources Division
Indian and Northern Affairs Canada

cc. Annette McRobert, Operations Directorate
Bob Wooley, Mackenzie Valley Land and Water Board
George Govier, Sahtu Land and Water Board
Gordon Wray, Northwest Territories Water Board
Robert Alexie, Gwich'in Land and Water Board
Rudy Cockney, North Mackenzie District
Ed Hornby, South Mackenzie District
Norman Wells Sub-District
Fort Simpson Sub-District
Fort Smith Sub-District
Hay River Sub-District
John Korec, National Energy Board
Harvey Gaukel, Government of the Northwest Territories
Terry Cook, DFO
Ed Collins, Environment Canada
James Thorbourne, Inuvialuit Land Administration
Gordon Mackay, Government of Nunavut

INAC Monthly Spill Reporting Form

Company Responsible:

Project Name and Water Licence #:

Month:

Date of Spill (d/m/y)	Product Spilled	Amount	Extent of Contaminated Area (m ²)	Location (latitude and longitude)

DIAND District Fax Numbers

North Mackenzie District (Inuvik): (867) 777-2090

Norman Wells Sub-District: (867) 587-2928

South Mackenzie District (Yellowknife) (867) 669-2720

Hay River Sub-District: (867) 874-2460

Fort Smith Sub-District: (867) 872-3472

Fort Simpson Sub-District: (867) 695-2615

Nunavut District: (867) 979-6445

National Energy
BoardOffice national
de l'énergieFile 9720-A000-7-2
14 July 2003Oil and Gas Exploration and Production Companies
Operating in Northwest Territories and Nunavut**Spill Reporting Protocol for Upstream Oil and Gas Operations in the
Northwest Territories and Nunavut Regulated by the National Energy Board****Protocol Purpose and Effective Date**

A revised upstream oil and gas spill reporting protocol (Protocol) is intended:

- 1) to more closely align spill reporting requirements with reporting requirements of other jurisdictions such as the territorial governments;
- 2) to focus spill notification and follow-up on spills that have potential to be an imminent threat to the environment; and
- 3) to minimize the number of spill reports of low volume and areal extent that can be immediately and adequately dealt with by the operator and have minimal or no potential to be a threat to the environment.

Effective 15 July 2003, the new Spill Reporting Protocol for Upstream Oil and Gas Operations in the Northwest Territories and Nunavut will apply to exploratory and development oil and gas drilling and production operations².

Protocol Highlights

The Upstream Oil and Gas Spill Reporting Protocol will:

- Apply to companies authorized to carry on drilling or production activities in the Northwest Territories and Nunavut and who meet the conditions set out in the Protocol;
- Apply to spills where either the NEB or Indian and Northern Affairs Canada (INAC) would be designated as lead agency as per the NWT Spills Working Agreement³;

...2

² Existing reporting protocols, such as for Imperial Oil Resources Ltd.'s Norman Wells facility and operations, would not be affected by this new protocol.

³ See attached Table 1A of the Northwest Territories/Nunavut Spills Working Agreement.

444 Seventh Avenue SW
Calgary, Alberta T2P 0X8444, Septième Avenue S.-O.
Calgary (Alberta) T2P 0X8**Canada**Telephone/Téléphone : (403) 292-4800
Facsimile/Télécopieur : (403) 292-5503
<http://www.neb.gc.ca>

- Establish that the triggers for immediately reportable spills meet *the Canada Oil and Gas Operations Act (COGOA) and Regulations* and, be consistent with the reporting triggers in the *Numavut and Northwest Territories Spill Contingency Planning and Reporting Regulations*⁴; and
- Require that each operator have, and implement, an approved spill contingency plan.

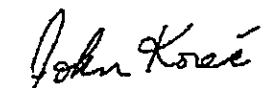
Immediately Reportable Spills

For the purpose of the Protocol, an "immediately reportable spill" is defined as a release of a substance that is likely to be an imminent environmental or human health hazard or meets or exceeds the volumes in Schedule 1.

Minor Spills

All other releases, for which there is no loss of control, are not considered immediately reportable spills and can be handled as part of ongoing operations and maintenance, i.e., immediately cleaned up. However, an on-site record shall be maintained for all releases, whether or not reported.

Please review the attached and if you wish to take advantage of this protocol, please contact me at (403) 292-6614.



John Korec, P.Geol.
Environmental Assessment Officer

c.c. Terry Baker, NEB
Gregory Lever, NEB
Rick Turner, NEB
Rick Fisher, NEB
Mieke Vander Valk, NEB

⁴ The Territories reference *Transportation of Dangerous Goods (TDG) Act* and Regulations for reportable quantities. The same quantities are intended for the Spill Reporting Protocol for those releases not addressed by the TDG or Regulations.

APPENDIX A

Terms and Conditions For Implementing the Spill Reporting Protocol For Upstream Oil and Gas Operations

1. Applies only to upstream projects in a single geographic area, i.e., well drilling programs or production operations including flowlines and pipelines. The Protocol does not apply to upstream geological or geophysical operations. UPSTREAM WELL DRILLING OR PRODUCTION OPERATIONS
2. Applies to spills for which the National Energy Board (NEB) or Indian and Northern Affairs Canada (INAC) would be designated as the Lead Agency under the Northwest Territories/Nunavut Spills Working Agreement. LEAD AGENCY
3. This Spill Reporting Protocol does not apply to spills for which the Government of the Northwest Territories (GNWT), Government of Nunavut (GNU), Environment Canada Environmental Protection Branch (EPB), Canadian Coast Guard (CCG), or Inuvialuit Land Administration would be designated as the Lead Agency under the Northwest Territories/Nunavut Spills Working Agreement. NON-APPLICABLE SPILLS
4. Immediately reportable spills include releases as per Schedule 1, and releases of substances of lesser volumes that are likely to be an imminent environmental or human health hazard or where an operator is uncertain if a release is reportable. IMMEDIATELY REPORTABLE SPILLS
5. An on-site record shall be kept of all minor spills and immediately reportable spills and be available for inspectors upon request, including the INAC Inspector prior to Land Use Permit closure. ON-SITE RECORD OF ALL SPILLS
6. Operator, i.e., the company or individual who holds an authorization for the project, must have a spill contingency plan approved by the NEB or INAC, i.e., signatories to the Northwest Territories/Nunavut Spills Agreement. SPILL CONTINGENCY PLAN
7. Spill contingency plan must meet the appropriate regulatory requirements and/or spill contingency planning guidelines, including procedures to clean up minor spills and ensure environmental protection.
8. Appropriate field spill kits, as indicated in the spill contingency plan, must accompany each crew and/or mobile equipment and/or vehicle.
9. Contractors and sub contractors for the Operator must abide by the Protocol and the spill contingency plan. All spills or releases, whether by the Operator, contractors or sub-contractors, remain the liability of the Proponent or Operator. LIABILITY

Schedule 1 – Immediately Reportable Quantities

TDG Class	Substance	Immediately Reportable Quantities for NWT/NU 24-Hour Spill Reports
1 2.3 2.4 6.2 7 None	Explosives Compressed gas (toxic) Compressed gas (corrosive) Infectious substances Radioactive 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 liquid	≥ 100 L
4.1 4.2 4.3	Flammable solid 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, e.g., crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater, etc.)	≥ 100 L or 100 kg
None	Sour natural gas (i.e., contains H ₂ S) Sweet natural gas	Uncontrolled release or sustained flow of 10 minutes or more

As well, all releases of harmful substances, regardless of quantity, are immediately reportable where the release:

- is near or into a water body;
- is near or into a designated sensitive environment or sensitive wildlife habitat;
- poses an imminent threat to human health or safety; or
- poses an imminent threat to a listed species at risk or its critical habitat.

Example Scenarios:**1. NEB Lead Agency (assumes spills are under control)**

Activity	Spill Location	Quantity & Product Spilled	Spill Reporting
Drilling operation	Drilling lease on Crown land	200 L gel-chem mud	Immediately reportable to the NWT 24-hour Spill Report Line
Drilling operation	Drilling lease on Crown land	2 m ³ sour gas	Immediately reportable to the NWT 24-hour Spill Report Line
Water injection line operation	Pipeline right-of-way on Crown land	150 L produced water from valve	Immediately reportable to the NWT 24-hour Spill Report Line
Drilling operation	Drilling lease on Crown land and into near-by creek	75 L of crude oil	Spill has entered a water body - immediately reportable to the NWT 24-hour Spill Report Line
Drilling operation	Drilling lease on Crown land	50 L oil-based mud	On-site record of spill & clean up.
Drilling operation	Drilling on Crown land	0.5 m ³ sweet gas	On-site record of spill & clean up.
Water injection line operation	Pipeline right-of-way on Crown land	80 L produced water from valve	On-site record of spill & clean up.
Drilling operation	Inside shed for the diesel-generator	100 L of diesel leaks into fully-contained generator shed	Not a spill -- diesel did not get into or threaten the environment or human health -- no report necessary. However, as an operational upset, the leak would be cleaned up and included on the daily tour sheet.

2. INAC Lead Agency (assumes spills are under control)

Activity	Spill Location	Quantity & Product Spilled	Spill Reporting
Fuel tank refilling	Bermed storage tank area on drilling lease on Crown Land	100 L gasoline	Immediately reportable to the NWT 24-hour Spill Report Line
Truck refuelling	Drilling lease on Crown land	2 L of diesel	On-site record of spill & clean up.
Camp operations	Camp on Crown land	75 L of grey water overflows camp sump	On-site record of spill & clean up.
Vibroseis operation	Seismic line on Crown land	50 ml of hydraulic fluid on snow, immediately scooped up and placed in disposal container	Protocol does not apply for a seismic operation -- however, this is not a spill as the hydraulic fluid did not enter the environment.
Truck refuelling	Seismic line on Crown land	2 L of diesel	Protocol does not apply for a seismic operation -- spill is immediately reportable to the NWT 24-hour Spill Report Line

3. Other Lead Agencies (assumes spills are under control unless otherwise stated)

Activity	Spill Location	Lead Agency	Quantity & Product Spilled	Spill Reporting
Drilling operation	Drilling lease on ILA land	ILA	50 L gel-chem mud	Protocol does not apply -- spill is immediately reportable to the NWT 24-hour Spill Report Line
Refilling tanks from fuel barge	River next to drilling base camp	CCG	10 L diesel fuel	Protocol does not apply -- spill is immediately reportable to the NWT 24-hour Spill Report Line
Fuel re-supply	Truck overturn on a territorial road (would also apply to spills within a community)	GNWT or GNU	50 L of diesel fuel	Refer to GNWT or GNU <i>Spill Contingency Planning and Reporting Regulations</i>

Table 1A
Designation of Lead Agency for spills in the NWT and NU
(From the Northwest Territories/Nunavut Spills Working Agreement)

<u>SPILL INCIDENT</u>	<u>LEAD AGENCY</u>
1. Spills on Commissioner's Land in NWT^{1,2} (i.e., Territorial Highways ³ , communities)	GNWT
Except:	
a) At facilities authorized under Federal Legislation.	INAC
b) At Federal Facilities ⁴ not authorized under Federal or Territorial legislation	EPB
c) At oil and gas exploration and production facilities ⁵	NEB
d) Those sections of Territorial Highways on ice surfaces.	INAC
2. Spills on Commissioner's Land in NU^{6,7} (i.e., Territorial Roads ⁸ , communities)	GN
Except:	
a) At facilities authorized under Federal Legislation.	INAC
b) At Federal Facilities ⁴ not authorized under Federal or Territorial legislation	EPB
c) At oil and gas exploration and production facilities ⁵	NEB

Table 1A cont'd

- | | |
|---|-----------------|
| 3. Spills on Territorial Land in NWT³² and NU³⁷ | INAC |
| Except: | |
| a) At Federal Facilities ⁴ not authorized under Federal or Territorial legislation | EPB |
| b) At oil and gas exploration and production facilities ⁵ | NEB |
| c) In National Parks. | EPB |
|
4. Spills on Water in NWT¹⁰ and NU¹⁰ |
INAC |
| Except: | |
| a) From ships and barges (i.e., ship source pollution incidents, including refuelling shore-based tanks from ships) | CCG |
| b) At oil and gas exploration and production facilities ⁵ | NEB |
|
5. Spills on Land in the NWT set aside under the Inuvialuit Land Claim.
(i.e., on private 7-1-a, b lands under the claim, excluding spills on water bodies) |
ILA |

FOOTNOTES:

- 1 **Commissioner's Land** means land in the NWT transferred by Order in Council to the GNWT and is, generally, land within a community, town or city.
- 2 See Table 1B for Jurisdiction Designation of Airports in the NWT.
- 3 **Territorial Highways** are described in the GNWT *Public Highways Act* Schedules A, B and C (attached as Table 1D).
- 4 **Federal Facilities** means any facility owned by the Government of Canada, such as DEW Line Stations, North Warning System Stations, High Arctic Weather Stations including airports, docks and wharves, and Research Centres, operated directly or indirectly by the following agents of the Crown:
 - Department of Industry
 - Department of Fisheries and Oceans
 - Indian and Northern Affairs Canada
 - Environment Canada
 - Natural Resources Canada
 - Health Canada
 - Department of National Defence
 - Transport Canada
 - Department of Public Works and Government Services (PWGSC)
 - Department of Justice
 - Royal Canadian Mounted Police (RCMP)

Crown Corporations such as:

 - Canadian National (Railway)
 - Canadian Broadcasting Corporation (CBC)
 - Canadian Mortgage and Housing Corporation (CMHC)
 - Federal Business Development Bank (FBDB)
 - Canada Post Corporation
 - Freshwater Fish Marketing Corp.

This designation does not include private dwellings owned or leased by PWGSC; or office and other complexes leased by PWGSC; or Petro-Canada facilities located within communities or on Commissioner's Land.
- 5 This designation includes pipelines, gas plants and refineries.
- 6 **Commissioner's Land** means land in NU which is described in the *Commissioner's Land Act*, R.S.N.W.T. 1988, c-11 as amended for NU pursuant to the *Nunavut Act* and is, generally, land within a community or town.
- 7 See Table 1C for jurisdictional designation of Airports in NU.
- 8 **Territorial Roads** are described in the GNWT *Public Highways Act* Schedules A, B and C (attached as Table 1E), and in the *Public Highways Act*, R.S.N.W.T. 1988, c.P-13, as amended for NU pursuant to the *Nunavut Act*.
- 9 **Territorial Land** means lands in NWT and NU that are vested in the Crown or for which the Government of Canada has power to dispose.
- 10 **Water** means both inland and Arctic waters as defined in the *Northwest Territories Waters Act* and *Arctic Waters Pollution Prevention Act*. Where a spill on land enters surface or ground water, the lead agency is the agency responsible for the spill on land.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**Appendix V MDSRC SPILL EQUIPMENT LISTING**

Revised: September 2005 Sept. 18 edition

**ANCHORS, BRIDLES
BUOYS & FLOATS**

		* * * * *											* Located @ IT&SC, Inuvik Airport (YEV) N 68° 18' 28.4" W 138° 28' 40.7"
ANCHORS	Danforth 25 lb. c/w chain & carabiner at chain end and on crown plate												21 K. ea
	Danforth 40 lb c/w chain & carabiner at chain end.	6											
	Danforth 43 lb c/w chain & carabiner at chain end and on crown plate	4											
	75 lb. Danforth, chain, 100' rope & shackle. Quick-link on crown plate	2											31 K ea
									1	2			59 K ea
ANCHOR PINS	Drive-in, 4'												6 K ea
	Drive-in, Delta wing	12											14 K ea
	Screw-in 5'	12											
BRIDLES	Shoreline, c/w snaps	2											
	Tow, Double	12											2 Kg.
	Tow, Single	4											3 K ea
	Tow, Single, c/w 50' rope	8											2 Kg.
BUOYS		1											5 kg
	A-1 (small)	3											2 K
	C-M3, Ring Top & Bottom	10											6 K ea
	A-6 (Large) c/w Wire Loops	4											17 K ea. Not yet inflated
PARAVANES	Boom tow, c/w Dble Tow Bridle								1	1			11 K

C

C

C

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

Shell Canada Limited	01/17/06	65
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Note. Any hardcopy of this page is considered to be uncontrolled

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

Flat File	1	
Funnel	1	
Fuses 20 Amp	4	
Fuses 30 Amp	4	
Gas, Jerry cans- 5 gall.	3	Refilled July '05 Boat spare gasoline stored in #6 (outdoors) due to hangar insurance policy
Gear Lube Pump	1	
Grease Gun	1	
Hacksaw c/w spare blades	1	
Hammer	1	
Heaving Line, c/w bag	2	
Impeller (Spare)	2	
In-Line Fuel Filter (Spare)	1	
Impeller Removal Socket	1	
Insect Repellent, Aerosol	6	
Jackknife c/w holster	1	
Knife, Utility	1	
Lantern c/w 6 v battery	1	
Life Vests	5	others in Container #6 & Floater Coats
Manual Package	1	
Oar	1	
Oil Filter Housing c/w filter (Spare)	1	
Paddle	1	
Pads, Sorbents	Y	
Penlight	1	Batteries Not Included
Pliers	2	
Pliers, Needlenose	1	
Quick Links	11	
VHF Marine Radio c/w manual	1	Model ICM502
Icom - Former Petrocan Radio c/w manual	1	Model ICF310

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

Ropes, various lengths	3		
Screwdriver, Multi tip	1		
Shackles, Assorted	Y		
Socket Set 1/4" & 3/8"	1		
Spare Tire (Trailer)		1	
Spare Tire Bracket			
Spark Plugs	1		
Spark Plug Gap Gauge	11		
Spotlamp, Handheld	1		
Stern Light Post, Removable	1		
Stirrup Belt (Swimmer Rescue Tool)	1		
Tire Gauge	1		
Tool Box	1		
Tow Hitch, Triple Ball	1		
Tow Hitch, 2"	1		
Tow Post, Removable, c/w 2 brackets	1		
Water Separator/Filter (spare)	1		
Wire, Copper (roll)	1		
Wire Cutters	1		
Worklight lamp, spare	1		
Wrench, Adjustable 6"	1		
Wrench, Adjustable 12"	1		
Wrench Set, 1 x 10 Piece Combination	1		
Wrench, Crescent - Various sizes	7		
BOOMS, BOOMVANE CABLES & CHAINS			
BOOMS		10	10
6" x 6" River Boom in 50' sections			120 lb per 50' section
Boom Connector Pin, Spares			
		Y	

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

BOOM BOX	ShoreSaver Boom in 50' sections	2	38 K ea	
	ShoreSaver Air/Water Loading Adapter c/w hose & camlock	1		
BOOMVANE	ShoreSaver Inflation Blower (gas) c/w Shore Saver load unload boom valve	1	Ser. 256976111	
	ShoreSaver Loading Hoses	2		
BOOMVANE RUDDER LOCKS	ShoreSaver Water Loading Strainer	1		
	c/w canvass cover	1		
CHAIN	Shallow Water Version c/w 150 m x 12 mm mooring line on reel	1		Install to allow open water sweeping. Remove for river deployments.
	Galv. 1/2" x 10' c/w carabiner	2		Chains are installed on each anchor
ELECTRICAL EQUIPMENT & GENERATORS				
EXTENSION CORDS	50'	2	2	2

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

100'		3	4	1	1	1	2	6 K ea
GENERATORS	Kodiak Gas Model SGB5500HX c/w Operation M annual	1	1					C.1 Ser. C007858 90K C.2 Ser. C008127 90K C.8 Ser. C008175 90K
LIGHT STAND	Portable, c/w light	3	3				4	
LIGHTS, HAND	Portable, 500W Halogen						2	
	Spare 500W Halogen bulbs	5	5	5	5	5	5	
FUEL, GAS, OIL, LUBES & ADDITIVES								
ANTI - FREEZE	Gas Line 150 ml	2	2				2	
DIESEL	5 gall. Jerry Can	1	1			2		#9 filled Aug. '04, rest filling date unknown #9 diesel stored in #6 container, due hangar insurance policy
GASOLINE	5 gall. Jerry Can	1	1			6		All Refilled July '05 Y = See boat
OIL/GAS MIX	4L Jerry Can						1	#8 & #9 gasoline and diesel stored in #6 container (outdoors), due hangar insurance policy
	2 gall Jerry Can	1	1					

02

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SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN**KAMLOCK LOCKING**

PINS (spare)

KAMLOCKS &

ADAPTERS

female adapter 2"
 female external thread 2"
 female / female adapter 2"
 female internal thread 4"
 hose cap 2"
 male external thread 2"
 male internal thread 2"
 female internal thread 4"
 male internal thread 4"
 male / male adapter 2"

4

1

2

1

1

1

4

1

1

1

4

SEALS, KAMLOCK

2" Rubber, Spares

6

SUCTION HOSES

2" x 25' c/w Camlock
 2" x 50' c/w Camlock

6

2

SUCTION SCREEN

2" c/w Camlock

3

SWEDGES

2" - 3" c/w Camlock
 2" - 4" c/w Camlock

2

2

**THREE WAY
MANIFOLD**

2"

2

VALVES

2" Ball, c/w camlocks

2

ICE EQUIPMENT

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

For Clothing (Chain Saw
Chaps, Winter Boots etc
see "Safety Equipment,
Personnel," or
"Miscellaneous"

AUGER - ICE	Gasoline Powered, Stihl 31cc Mod. BT120 c/w 10" bit and 2' extension	1	17 K 2Stroke Engine, needs premix
AUGER - ICE	6" Bit	1	
AUGER/CHAIN SAW TOOL KIT	Includes chain file etc.	1	11 K
CHAIN SAW	Gasoline Powered Stihl 92cc Model 066 c/w 36" bar & chain. Mounted on Sleigh.	1	Marked 8815 . 106 K with sleigh #2
CHAIN SAW	Gasoline Powered Stihl 92cc Model 066 c/w 52" bar & chain. Mounted on Sleigh.	1	Marked 8816 . 136 K with sleigh #1
CHAIN SAW BAR	48" Spare	1	2 K
CHAIN SAW CHAIN	48" Spare	1	1 K
ICE BLOCK LIFTER CHAINS	c/w "T" Bar	2	15 K Tot
LADLES		2	
SAW SLEIGH		2	Saw sleigh ski-doo skis (4) are in #8 awaiting replacing present sleigh runners.

Shell Canada Limited	01/17/06	73
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SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

	PROPANE BOTTLES	20lb	Filled July '05 # 8 Propane Bottles (2) Stored in # 6 Container (outside) due Hangar Insurance Policy
PROPANE TORCH KIT	c/w storage case, spark lighter, spare flints, flame spreader, utility flame tip, propane cylinder		
PRY BAR	5'	2 2 2 2 2	1
QUICK LINKS, spares	See Carbiners		
RAGS (BOX)			1
RAKES	LONG HANDLE	2 2 2 2 2 3	
RANGEFINDER	Laser, in Black Pelican Case		9 K Tot
SCRAPER	Ice	2 2 2 2 1 1	Includes spare 9V battery. New July '05
SCREWDRIVER	Flat Blade, Large Multi tip	1 1 1 1 1 1	
SHACKLES	1/4" 3/8" 1/2" Miscellaneous, in sack		
SHOVELS	Long Handled Scoop, Aluminium Snow	2 2 2 2 2 4 4 4 4 4 4 4 1 2 2 1 2	2 K ea 5 K ea

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

SIGNS	Caution Restricted Area	1 2	24 K. ea
"SMART ASH" BURNER c/w 45 gall drum & oil injector pump c/w manual	1	1	65 kg ea. Awaiting new unit for #8
"SMART ASH" BURNER BASE	1		122 Kg ea. 2 new bases to be constructed
"SMART ASH" OPERATING MANUALS (spare)		2	
"SMART ASH" Filters	5	5	1 K
SMART ASH HEAD Spare (used)		1	
SOCKET SET	1	1	
20 piece 3/8" c/w plastic case	1	1	
10 piece combination	1		
57 piece combination - 3/8" c/w plastic case		1	
STRAPS, TIEDOWN			TBA TBA
1" x 15' 2" x 15'			
SQUEEGEE	2	2	
Long Handled	2	2	
TAPE	1	1	
CAUTION	1	1	
DANGER	1	1	
DUCT	1	1	
ELECTRICAL (ROLLS)	1	1	
FLAGGING (ROLLS)	1	1	
TEFLON (ROLLS) - pipe tape	1	1	
	5	5	in wooden Camlock box

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

54 K Tot.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

ZIPLOC PLASTIC BAGS Box	Combination Open End Box End Set 11, imperial	1			
	Combination Open End Box End Set 11, metric	1			
	Sparkplug	1			
		1			
PUMPS					
See also under "Skimmers"					
DIESEL					
GASOLINE	2" Honda Trash Model WT20X	1			Ser GCO2-8480904 50K
	2" Honda Trash Model WT20X	1			Ser. GCO2-8480921 50K
	2" Honda Centrif. Mod. WN 20	1			Ser. GCAJ-1246059 22K
	2" Honda Peristalt. Mod. GX200	1			Ser.GCAE-1848726 60K
	2" Honda Peristalt. Mod. GX200	1			Ser. GCACT-1105034 69K B ig cage
ROPES & ROPE REELS					
ROPE	1/2" x 25', floating, loop & hook	6			15K Tot. On Metal Reel
	1/2" x 25', floating, loop & hook Yellow	7			15K Tot. On Metal Reel
	1/2" x 50' ,floating, loop & hook	6			20K Tot. On Metal Reel

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

REEL	1/2" x 100' ,floating, loop & hook	1	1	1	1	1	4	22 K Tot. on Metal Reel
REEL	5/8" yellow x 175'	1	1	1	1	1	1	11 K Tot. On Wood Reel (red)
	1/2" x 50' thimble one end	1	1	1	1	1	1	4 K
	1/2" x 25' thimble both ends	1	1	1	1	1	1	2K
	Rope, Metal						4	
	Rope, Wood						1	
SAFETY EQUIPMENT GENERAL								
Air HORN		1	1	1	1	1		
AIR HORN REFILL		1	1	1	1	1		
EMERGENCY KIT	Roadside	1	1	1	1	1	2	9 K ea
EYE WASH STATION	c/w irrigating liquid, pads, cold packs etc						1	Tote 20
FIRST AID KIT	10 man #3 BC Level 3 NWT #1 (loaner required by journey management)	1	1	1	1	1	1	Added July '05
FIRE EXTINGUISHER	20 lb ABC	2	2	2	2	2		Serviced/Replenished June '04
	20lb ABC N2 Refillable						2	New July '05
	2 1/2 lb ABC (loaner required by						1	New Apr. '05

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SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

COVERALLS, DISPOSABLE, TYVEK	Size XL	4	5	4	4	4	50	38	5 K Tot. in 2 boxes
COVERALLS, INSULATED	Size XL								
EARPLUGS	Box							1	
FACESHIELDS									
FLOATER COATS	Size XL						7		In Small Black Tote
GOGGLES	Chemical								
GLOVES	Chemical resistant "Barrier", pr. Latex 12" Monkey Grip Neoprene	4 12	4 12	4 12	4 12	4 12	12 12	17 12 20	
HARDHATS								4	T20
INSECT REPELLANT	"Deep Woods Off", Aerosol							2	
LIFEVESTS	Large Extra Large						6	5	In Small Black Tote
RAINWEAR	Jacket & Pants set Medium Large Extra Large Extra Large							1 5 8 4	
RESPIRATORS	Half Mask c/w 2 org.vap. carts. Full Face c/w 2 org.vap.carts.							4 2	

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SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

Multi - Head	Canadyne Model 1230D	1	Powerpack & Hoses 275K
	Yanmar 10 hp diesel powerpack	1	
	S2T2 Hydratech discharge pump	1	
	Disc Insert for Multi-Head	1	Skimmer head, drum & pump 80K. In wooden box
	Drum Insert for Multi-Head	1	Discs in crate 68K
	Skimmer disc. hose 25'	2	5K
	Skimmer suction hose 25' (green)	1	8K
Rope Mop	Aquaguard Model 40D c/w Yanmar diesel Powerpack	1	Ser. 2443 100Kg
	Air Filters	2	
	Fuel Filters	2	
	Mop return, float & rope	1	15 K
	Oil Strainers	2	
	Recoil Spring	1	
	Starter Ropes	2	
	Spare mop for 40D	1	8K
Skim Pak		1	9K
	Extension suction tubes c/w Camlock	3	12K
SORBENTS			

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

BOOMS (Socks)	Sorbents, Bags of 4	4	5	4	3	4	1	2	
FLOOR DRY	Granular	2	13	15	14	16			
GRANULAR	Other than Floor Dry	3	2	2	2	1			
PADS		7	20	11	26	20	8	4	1
RAGS	Box							1	
ROLLS	Sorbents	1	2	2	2	2	1	2	
SAWDUST	Bags	9	12	9	11	10			
TANKS AND RELATED EQUIPMENT									
TERRA-TANK	Pillow type 1500 Imp. Gall						2		36 K ea
TERRA TANK FITTINGS In Sacks							2		6 K ea
TERRA REPAIR KIT							2		5 K ea
TOTE TANKS c/w Lids									
#11		1							
#12			1						
#13									
#14				1					
#15									
#16					1				
#17							1		
#18								1	Empty
#19								1	Decon. Equip.

SITE-SPECIFIC GENERAL EMERGENCY RESPONSE PLAN

#20	Revised Dates	Container Purposes	1	Additional PPE
#1- #5 Inclusive		Small "nuisance" type spills River boom support equipment		
#6		General - Extra PPE, Decon. equip.		
#7		Winter spill, ice response equip.		
#8		Pumps, skimmers, hoses etc.		
#9				



NWT SPILL REPORT

(Oil, Gas, Hazardous Chemicals or other Materials)

24 – Hour Report Line
Phone: (867) 920-8130
Fax: (867) 873-6924

A Report Date and Time		B Date and Time of spill (if known)		C <input type="checkbox"/> Original Report <input type="checkbox"/> Update no. _____		Spill Number	
D Location and map coordinates (if known) and direction (if moving)							
E Partly responsible for spill							
F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible)							
G Cause of spill							
H Is spill terminated? <input type="checkbox"/> yes <input type="checkbox"/> no		I If spill is continuing, give estimated rate		J Is further spillage possible? <input type="checkbox"/> yes <input type="checkbox"/> no		K Extent of contaminated area (in square meters if possible)	
L Factors effecting spill or recovery (weather conditions, terrain, snow cover, etc.)				M Containment (natural depression, dikes, etc.)			
N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials							
O Do you require assistance? <input type="checkbox"/> no <input type="checkbox"/> yes, describe:				P Possible hazards to person, property, or environment; eg: fire, drink water, fish or wildlife			
Q Comments or recommendations						FOR SPILL LINE USE ONLY	
						Lead agency	
						Spill significance	
						Lead Agency contact and time	
						Is this file now closed? <input type="checkbox"/> yes <input type="checkbox"/> no	
Reported by		Position, Employer, Location				Telephone	
Reported to		Position, Employer, Location				Telephone	

NORTHWEST
TERRITORIES
WATER BOARD



NUNAPPA
SIVUNIUKPAIT
IMMAKUN

WATER REGISTER: N7L1-1762

November 1, 2005

Mr. Randall Warren
Shell Canada Ltd.
400 - 4 Avenue S.W.
P.O. Box 100, Station M
CALBARY, AB T2P 0J4

Dear Mr. Warren:

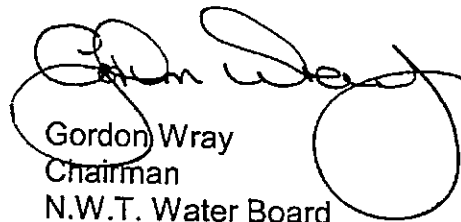
ISSUANCE OF A "B" TYPE LICENCE - CAMP FAREWELL

Attached is a duplicate of Licence No. N7L1-1762 granted to Shell Canada Ltd. by the Northwest Territories Water Board in accordance with the *Northwest Territories Waters Act*. The other original of this Licence has been filed with the Department of Indian Affairs and Northern Development in Yellowknife, Northwest Territories. Also attached are general procedures for the administration of licences in the Northwest Territories. I request that you review these and address any questions to the Board's office.

In conclusion, please be advised that this letter with attached procedures, all inspection reports, and correspondence related thereto are part of the public Water Register, and are intended to keep all interested parties informed of the manner in which the Licence requirements are being met. All Water Register material will be considered when the Licence comes up for renewal or amendment.

The full cooperation of Shell Canada Ltd. is anticipated.

Sincerely,


Gordon Wray
Chairman
N.W.T. Water Board

Attach.

**GENERAL PROCEDURES FOR THE ADMINISTRATION OF LICENCES
ISSUED UNDER THE NORTHWEST TERRITORIES WATERS ACT
IN THE NORTHWEST TERRITORIES**

1. At the time of issuance, a copy of the Licence is placed on the Water Register in the Office of the Northwest Territories Water Board in Yellowknife, and is then available to the public.
2. To enforce the terms and conditions of the Licence, the Minister of Indian Affairs and Northern Development has appointed Inspectors in accordance with Section 35(1) of the *Northwest Territories Waters Act*. The Inspectors coordinate their activities with officials of the Water Resources Division of the Department of Indian Affairs and Northern Development. The Inspector responsible for Licence No. N7L1-1762 is located in the North Mackenzie -Inuvik District Office.
3. To keep the Water Board and members of the public informed of the Licensee's conformity to Licence conditions, the Inspectors prepare reports which detail observations on how each item in the Licence has been met. These reports are forwarded to the Licensee with a covering letter indicating what action, if any, should be taken. The inspection reports and covering letters are placed on the public Water Register, as are any responses received from the Licensee pertaining to the inspection reports. It is therefore of prime importance that you react in all areas of concern regarding all inspection reports so that these concerns may be clarified.
4. If the renewal of Licence No. N7L1-1762 is contemplated it is the responsibility of the Licensee to apply to the Water Board for renewal of the Licence. The past performance of the Licensee, new documentation and information, and points raised during a public hearing, if required, will be used to determine the terms and conditions of any Licence renewal. Please note that if the Licence expires and another has not been issued, then water and waste disposal must cease, or you, the Licensee, would be in contravention of the *Northwest Territories Waters Act*. It is suggested that an application for renewal of Licence No. N7L1-1762 be made at least eight months in advance of the Licence expiry date.
5. If, for some reason, Licence No. N7L1-1762 requires amendment, then a public hearing may be required. You are reminded that applications for amendments should be submitted as soon as possible to provide the Water Board with ample time to go through the amendment process. The process may take up to six (6) months or more depending on the scope of the amendment requested.

LETTER OF CREDIT (Security deposits) - recommended wording

[BANK ADDRESS]

IRREVOCABLE LETTER OF CREDIT

[The term "Documentary Credit" may also be used instead of "Letter of Credit"]

DATE OF ISSUE: [date] OUR REFERENCE NUMBER: [Bank's Reference Number]
AMOUNT: CAD\$#####.00
MAXIMUM: #####.00
CANADIAN DOLLARS ONLY

APPLICANT:

["Customer" can be used instead
of "Applicant"]
[Company's Name]
[Company's Address]

BENEFICIARY:

RECEIVER GENERAL FOR CANADA
ON BEHALF OF THE MINISTER OF
INDIAN AFFAIRS AND NORTHERN DEVELOPMENT
4914 - 50 Street, 3rd Floor
P.O. Box 1500
YELLOWKNIFE, NT X1A 2R3

ATTENTION: REGIONAL DIRECTOR GENERAL
DIAND - NT REGION

RE: SECURITY PURSUANT TO [the Water Licence Type and Number]

AT THE REQUEST AND FOR THE ACCOUNT OF [Company's Name] (THE "APPLICANT"), WE, [Bank's Name], HEREBY ESTABLISH IN YOUR FAVOUR OUR IRREVOCABLE LETTER OF CREDIT NO. [Bank's Reference Number] ("CREDIT") FOR SUMS NOT EXCEEDING IN THE AGGREGATE [Amount of Security required stated in Canadian Dollars].

THIS CREDIT IS AVAILABLE WITH US FOR DRAWING AT SIGHT, WITHOUT ENQUIRY AS TO WHETHER YOU HAVE A RIGHT AS BETWEEN YOURSELF AND THE APPLICANT TO MAKE SUCH DEMAND AND WITHOUT RECOGNIZING ANY CLAIM OF THE APPLICANT, AGAINST PRESENTATION TO US, BY YOU OR YOUR DULY AUTHORIZED REPRESENTATIVE OR AGENT, OF THE FOLLOWING DOCUMENTS:

1. A SIGHT DRAFT DRAWN ON [Bank's Name and Address of the Branch that the security can be drawn at, usually one of the Bank's larger commercial banking centres]; AND
2. THE ORIGINAL OF THIS IRREVOCABLE LETTER OF CREDIT NO. [Bank's Reference Number] FOR ENDORSEMENT OF PAYMENT THEREON; AND
3. A STATEMENT SIGNED BY AN OFFICIAL OF THE DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT CERTIFYING
 - A) THAT THE SIGNATORY IS AN OFFICIAL OF THE DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT AND HAS THE AUTHORITY TO SIGN THE STATEMENT ON BEHALF OF THE MINISTER OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT (THE "MINISTER"), AND
 - B) EITHER
 - I. THAT THE MINISTER IS ENTITLED TO APPLY THE AMOUNT DRAWN, BEING ALL OR PART OF THE SECURITY POSTED AND MAINTAINED PURSUANT TO [the Water Licence Type and Number] ISSUED BY THE NORTHWEST TERRITORIES WATER BOARD, WHETHER AS ORIGINALLY ISSUED OR AS AMENDED OR RENEWED FROM TIME TO TIME, OR
 - II. THAT THIS CREDIT IS DUE TO EXPIRE IN THIRTY (30) DAYS OR LESS AND THAT THE APPLICANT HAS NOT REPLACED THIS CREDIT BY POSTING WITH THE MINISTER OTHER SECURITY SATISFACTORY TO THE MINISTER.

PARTIAL DRAWING ARE PERMITTED.

THIS CREDIT IS EFFECTIVE FROM [time] A.M. ON [effective date as required by Water Licence] AND SHALL EXPIRE AT OUR COUNTERS AT [time] P.M. [expiry date] (THE "INITIAL EXPIRATION DATE"). THIS CREDIT SHALL BE RENEWE AUTOMATICALLY FOR AN ADDITIONAL ONE-YEAR PERIOD FROM THE INITIAL EXPIRATION DATE, AND FOR AN ADDITIONAL ONE-YEAR PERIOD FROM EACH FUTURE EXPIRATION DATE, UNLESS AT LEAST NINETY (90) DAYS PRIOR TO THE OPERATIVE EXPIRATION DATE WE NOTIFY YOU IN WRITING BY REGISTERED MAIL OR COURIER THAT WE ELECT NOT TO CONSIDER THIS CREDIT RENEWED FOR SUCH ADDITIONAL PERIOD.

WE HEREBY AGREE THAT ALL DRAFTS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS CREDIT SHALL BE DULY HONOURED BY US IF PRESENTED FOR PAYMENT ON OR BEFORE THE OPERATIVE EXPIRATION DATE.

EXCEPT SO FAR AS IS OTHERWISE EXPRESSLY STATED HEREIN, THIS CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS (1993 REVISION), INTERNATIONAL CHAMBER OF COMMERCE, PUBLICATION NO. 500. NOTWITHSTANDING ARTICLE 17 OF SAID PUBLICATION, IF THIS CREDIT EXPIRES DURING AN INTERRUPTION OF BUSINESS AS DESCRIBED IN ARTICLE 17, WE AGREE TO EFFECT PAYMENT IF THIS CREDIT IS DRAWN ON US WITHIN FIFTEEN (15) DAYS AFTER THE RESUMPTION OF BUSINESS.

[Bank's Name]

[Official's Name and Position]

[Official's Name and Position]

LETTER OF CREDIT (Security deposits) - recommended wording

[BANK ADDRESS]

IRREVOCABLE LETTER OF CREDIT

[The term "Documentary Credit" may also be used instead of "Letter of Credit"]

DATE OF ISSUE: [date] OUR REFERENCE NUMBER: [Bank's Reference Number]
AMOUNT: CAD\$#####.00
MAXIMUM: #####.00
CANADIAN DOLLARS ONLY

APPLICANT:

["Customer" can be used instead
of "Applicant"]
[Company's Name]
[Company's Address]

BENEFICIARY:

RECEIVER GENERAL FOR CANADA
ON BEHALF OF THE MINISTER OF
INDIAN AFFAIRS AND NORTHERN DEVELOPMENT
4914 - 50 Street, 3rd Floor
P.O. Box 1500
YELLOWKNIFE, NT X1A 2R3

ATTENTION: REGIONAL DIRECTOR GENERAL
DIAND - NT REGION

RE: SECURITY PURSUANT TO [the Water Licence Type and Number]

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1. A SIGHT DRAFT DRAWN ON [Bank's Name and Address of the Branch that the security can be drawn at, usually one of the Bank's larger commercial banking centres]; AND
2. THE ORIGINAL OF THIS IRREVOCABLE LETTER OF CREDIT NO. [Bank's Reference Number] FOR ENDORSEMENT OF PAYMENT THEREON; AND
3. A STATEMENT SIGNED BY AN OFFICIAL OF THE DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT CERTIFYING
 - A) THAT THE SIGNATORY IS AN OFFICIAL OF THE DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT AND HAS THE AUTHORITY TO SIGN THE STATEMENT ON BEHALF OF THE MINISTER OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT (THE "MINISTER"), AND
 - B) EITHER
 - I. THAT THE MINISTER IS ENTITLED TO APPLY THE AMOUNT DRAWN, BEING ALL OR PART OF THE SECURITY POSTED AND MAINTAINED PURSUANT TO [the Water Licence Type and Number] ISSUED BY THE NORTHWEST TERRITORIES WATER BOARD, WHETHER AS ORIGINALLY ISSUED OR AS AMENDED OR RENEWED FROM TIME TO TIME, OR
 - II. THAT THIS CREDIT IS DUE TO EXPIRE IN THIRTY (30) DAYS OR LESS AND THAT THE APPLICANT HAS NOT REPLACED THIS CREDIT BY POSTING WITH THE MINISTER OTHER SECURITY SATISFACTORY TO THE MINISTER.

PARTIAL DRAWING ARE PERMITTED.

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[Bank's Name]

[Official's Name and Position]

[Official's Name and Position]

6. Specific clauses of your Licence make reference to the Board, Analyst or Inspector. The contact person, address, phone and fax number of each is:

BOARD: Executive Assistant
Northwest Territories Water Board
P.O Box 1326
YELLOWKNIFE, NT X1A 2N9
Phone No: (867) 765-0106
Fax No: (867) 765-0114

ANALYST: Analyst
Water Laboratory
Department of Indian Affairs
and Northern Development
P.O. Box 1500, 4601 - 52nd Avenue
YELLOWKNIFE, NT X1A 2R3
Phone No: (867) 669-2780
Fax No: (867) 669-2718

INSPECTOR: Inspector
North Mackenzie-Inuvik District Office
Department of Indian Affairs
and Northern Development
P.O. Box 2100
INUVIK, NT X0E 0T0
Phone No: (867) 777-3361
Fax No: (867) 777-2090

7. Your Licence requires a security deposit be submitted. Should the security deposit be submitted in the form of a "letter of credit", recommended wording is outlined below. It is advised that a "draft" letter of credit be forwarded to Water Resources Division for review. The contact person, address, phone and fax number of the individual administering security deposits is:

Office Administrator
Water Resources Division
Indian and Northern Affairs Canada
P.O. Box 1500
YELLOWKNIFE, NT X1A 2R3
Phone No: (867) 669-2651
Fax No: (867) 669-2716

NORTHWEST TERRITORIES WATER BOARD

Pursuant to the *Northwest Territories Waters Act* and Regulations the Northwest Territories Water Board, hereinafter referred to as the Board, hereby grants to

SHELL CANADA LIMITED

(Licensee)

400 - 4 Avenue S.W.
P.O. Box 100, Station M
CALGARY, ALBERTA T2P 0J4

of

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water subject to the restrictions and conditions contained in the *Northwest Territories Waters Act* and Regulations made thereunder and subject to and in accordance with the conditions specified in this Licence.

Licence Number

N7L1-1762 RENEWAL

Licence Type

"B"

Water Management Area

NORTHWEST TERRITORIES 07

Location

"Camp Farewell"
Latitude 69°12'30" North
Longitude 135°06'04" West
MACKENZIE RIVER DELTA, N.W.T.

Purpose

TO USE WATER AND DISPOSE OF
WASTE FOR MUNICIPAL
UNDERTAKINGS AND ASSOCIATED
USES

Description

OIL AND GAS EXPLORATION

Quantity of Water Not to be Exceeded

150 CUBIC METRES DAILY

Effective Date of Licence

NOVEMBER 1, 2005

Expiry Date of Licence

OCTOBER 31, 2010

This Licence issued and recorded at Yellowknife includes and is subject to the annexed conditions.

NORTHWEST TERRITORIES WATER BOARD

Witness

Chairman

PART A: SCOPE AND DEFINITIONS

1. Scope

- a) This Licence entitles Shell Canada Limited to use Water and dispose of Waste for municipal undertakings associated with oil and gas exploration and development in the Mackenzie Delta at Farewell Camp and Stockpile Site (Camp Farewell) located at Latitude 69°12'30" North, and Longitude 135°06'04" West, Northwest Territories;
- b) This Licence is issued subject to the conditions contained herein with respect to the taking of Water and the depositing of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the *Northwest Territories Waters Act*, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations; and
- c) Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

In this Licence: **N7L1-1762**

"Act" means the *Northwest Territories Waters Act*;

"Analyst" means an Analyst designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act*;

"Average Concentration For Faecal Coliform" means the geometric mean of any four consecutive analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

"Board" means the Northwest Territories Water Board established under Section 10 of the *Northwest Territories Waters Act*;

"Freeboard" means the vertical distance between water line and crest on a dam or dyke's upstream slope;

"Geotechnical Engineer" means a professional engineer registered with the Association of Professional Engineers, Geologists, and Geophysicists of the Northwest Territories and whose experience is the design and construction of earthworks in a permafrost environment;

"Greywater" means all liquid Wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet Wastes;

"Inspector" means an Inspector designated by the Minister under Section 35(1) of the *Northwest Territories Waters Act*;

"Licensee" means the holder of this Licence;

"Maximum Average Concentration" means the running average of any four (4) consecutive analytical results, or if less than four analytical results collected, and submitted to the Inspector in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

"Minister" means the Minister of Indian Affairs and Northern Development;

"Modification" means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does include an expansion;

"Permeability" means the capacity to transmit water through a medium;

"Sewage" means all toilet Waste and greywater;

"Toilet Wastes" mean all human excreta and associated products, but does not include greywater;

"Regulations" mean Regulations proclaimed pursuant to Section 33 of the *Northwest Territories Waters Act*;

"Sewage Treatment Facilities" comprises the area and engineered structures designed to contain sewage as identified in the Project Description and also includes a Sump constructed of impervious material and/or with an impervious liner;

"Sump" means an excavation for the purpose of catching or storing Water and/or Waste;

"Waste" means Waste as defined by Section 2 of the *Northwest Territories Waters Act*; and

"Waters" mean Waters as defined by Section 2 of the *Northwest Territories Waters Act*.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report with the Board not later than March 31st of the year following the calendar year reported which shall contain the following information:
 - a) the total quantity in cubic metres of fresh Water obtained from all sources;
 - b) the total quantities in cubic metres of each and all Waste discharged;
 - c) the location and direction of flow of all Waste discharged to the Water;
 - d) the results of sampling carried out under the Surveillance Network Program;
 - e) a summary of any modifications carried out on the Water supply and Sewage Treatment Facilities, including all associated structures;
 - f) a list of spills and unauthorized discharges;
 - g) details on the restoration of any sumps;
 - h) any revisions to the approved Contingency Plan; and,
 - i) any other details on Water use or Waste disposal requested by the Board within forty-five (45) days before the annual report is due.
2. The Licensee shall comply with the "Surveillance Network Program" annexed to this Licence, and any amendment to the said "Surveillance Network Program" as may be made from time to time, pursuant to the conditions of this Licence.
3. The "Surveillance Network Program" and compliance dates specified in the Licence may be modified at the discretion of the Board.

4. The Licensee shall, within thirty (30) days of the issuance of the Licence, post the necessary signs to identify the stations of the "Surveillance Network Program". All postings shall be located and maintained to the satisfaction of an Inspector.
5. Meters, devices or other such methods used for measuring the volumes of Water used and Waste discharged shall be installed, operated and maintained by the Licensee to the satisfaction of an Inspector.
6. All monitoring data shall be submitted in printed form and electronically in spreadsheet format on a diskette or other electronic forms acceptable to the Board.
7. All reports shall be submitted to the Board in printed format accompanied by an electronic copy in a common word processing format on diskette or other electronic forms acceptable to the Board.
8. Within thirty (30) days of issuance of this Licence, pursuant to Section 17(1) of the Act and Section 12 of the Regulations, the Licensee shall have posted and shall maintain a security deposit of Two Million (\$2,000,000.00) Dollars in a form suitable to the Minister.
9. The Licensee shall ensure a copy of this Licence is maintained at the site of operation at all times.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain Water from the Middle Channel of the Mackenzie River in winter or the unnamed lake north of the camp in summer as described in the project description, or as otherwise approved by an Inspector.
2. For lakes used as a Water source, a representative dissolved oxygen/temperature profile must be obtained prior to the initial Water withdrawal and prior to demobilization of the project for the year.

3. The Licensee is not permitted to remove more than five (5%) percent of the available under ice Water volume per lake as calculated using a maximum expected ice thickness of two (2) meters during a single winter season.
4. The daily quantity of Water used for all purposes shall not exceed 150 cubic metres.
5. The Water intake hose used on the Water pumps shall be equipped with a screen with a mesh size sufficient to ensure no entrainment of fish (2.54 mm).

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall within thirty (30) days of the issuance of this Licence, submit to the Board for approval an updated Operation and Maintenance Plan for the Sewage and Solid Waste Treatment Facilities. This Plan shall include but not necessarily be limited to details on the design, operational capacity, management and maintenance, and disposal of sludges.
2. All Sewage shall be directed to the onsite Sewage Treatment Facilities as approved by an Inspector.
3. The Sewage Treatment Facilities shall be maintained and operated in such a manner as to prevent structural failure to the satisfaction of the Inspector.
4. All Waste discharged from the onsite Sewage Treatment Facilities shall be directed to the channel of the Mackenzie River at a location approved by an Inspector.
5. There shall be no discharge of floating solids, garbage, grease, free oil or foam.

6. All Sewage effluent discharged by the Licensee from the Sewage Treatment Facilities at "Surveillance Network Program" Station Number 1762-1 shall meet the following effluent quality requirements:

Sample Parameter	Maximum Average Concentration
Biological Oxygen Demand (BOD ₅)	70.0 mg/L
Total Suspended Solids (TSS)	70.0 mg/L
Faecal Coliforms	10E4 CFU/dL
Oil and Grease	5.0 mg/L
Total Residual Chlorine (TRC)	0.1 mg/L

The Waste discharged shall have a pH between 6 and 9.

7. Introduction of Water to Waste for the purpose of achieving effluent quality requirements in Part D, Item 5 is prohibited.
8. The Licensee shall dispose of all solid Wastes in a manner acceptable to the Inspector.
9. A freeboard limit of 1.0 metre shall be maintained at all times in the Sump, part of the Sewage Treatment Facilities, or as recommended by a Geotechnical Engineer and or as approved by the Board.
10. The Licensee may commence decanting upon receipt of an Inspector's approval.
11. All analyses shall be conducted in accordance with methods prescribed in the current edition of "Standard Methods for the Examination of Water and Wastewater" or by such other methods as may be approved by an Analyst.

PART E: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written approval from the Board, carry out Modifications to the planned undertakings provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:
 - a) the Licensee has notified an Inspector in writing of such proposed Modifications at least five (5) days prior to beginning the Modifications;
 - b) such Modifications do not place the Licensee in contravention of either this Licence or the Act;
 - c) an Inspector has not, during the five (5) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than five (5) days; and
 - d) an Inspector has not rejected the proposed Modifications.
2. Modifications for which all of the conditions referred to in Part E, Item 1 have not been met may be carried out only with written approval from an Inspector.
3. The Licensee shall provide to the Board as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modifications.

PART F: CONDITIONS APPLYING TO CONTINGENCY PLANNING

1. The Licensee shall submit to the Board for approval within thirty (30) days of the issuance of this Licence an updated Emergency Response & Spill Contingency Plan.
2. The Licensee will maintain a copy of the approved Emergency Response & Spill Contingency Plan onsite in a readily available location, to the satisfaction of an Inspector.

3. The Licensee shall ensure that petroleum products, hazardous material and other Wastes associated with the project do not enter any Waters.
4. The Licensee shall ensure that all containment berms are constructed of an impermeable material, to the satisfaction of an Inspector.
5. The Licensee shall ensure that fuel stored in each tank within the tank farm be no greater than 85% of the tank's capacity to allow for expansion and avoid overflows.
6. If, during the period of this Licence, an unauthorized discharge of Waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a) report the incident immediately via the 24 Hour Spill Reporting Line (867) 920-8130; and
 - b) submit to an Inspector a detailed report on each occurrence not later than thirty (30) days after initially reporting the event.

PART G: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board for approval within one (1) year of issuance of this Licence, an updated Interim Abandonment and Restoration Plan including a complete Phase II Environmental Assessment of Camp Farewell. This assessment will include the full delineation of contamination (soil and Water) associated with Camp Farewell operations, located both on and off the gravel base pad. The Licensee shall implement this Plan as and when approved by the Board.
2. The Licensee shall review the Interim Abandonment and Restoration Plan every two (2) years and shall modify the Plan as necessary to reflect changes in operations and technology. All proposed modifications to the Plan shall be submitted to the Board for approval.

NORTHWEST TERRITORIES WATER BOARD


Witness


Chairman

NORTHWEST TERRITORIES WATER BOARD

LICENSEE: Shell Canada Limited

LICENCE NUMBER: N7L1-1762

EFFECTIVE DATE OF LICENCE: November 1, 2005

EFFECTIVE DATE OF
SURVEILLANCE NETWORK PROGRAM: November 1, 2005

SURVEILLANCE NETWORK PROGRAM

A. Location of Sampling Stations

<u>Station Number</u>	<u>Description</u>
1762-1	Treated Sewage at the Point of Discharge

B. Sampling and Analysis Requirements

1. Water at Station Number 1762-1, shall be sampled every two weeks, and analyzed for the following parameters:

BOD ₅	Total Suspended Solids
Oil and Grease	Faecal Coliforms
Ammonia	pH
Phosphorous	Total Residual Chlorine

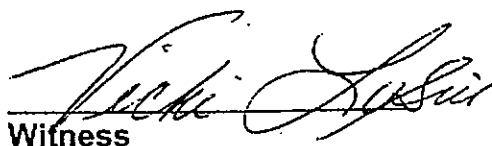
2. More frequent sample collection maybe required at the request of an Inspector.

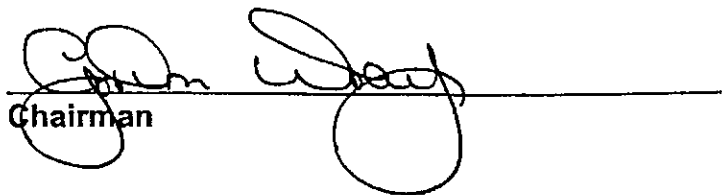
3. All sampling, sample preservation, and analyses shall be conducted in accordance with methods prescribed in the current edition of "Standard Methods for the Examination of Water and Wastewater", or by such other methods approved by an Analyst.
4. All analyses shall be performed in a laboratory approved by an Analyst.
5. The Licensee shall, by December 31st, 2005, submit to an Analyst for approval a Quality Assurance/Quality Control Plan.
6. The Plan referred to in Part B, Item 5 shall be implemented as approved by an Analyst.

C. Reports

1. The Licensee shall, within thirty (30) days following the month being reported, submit to the Board all data and information required by the "Surveillance Network Program" including the results of the approved Quality Assurance Plan.

NORTHWEST TERRITORIES WATER BOARD


Witness


Chairman

-----Original Message-----

From: Kevin Glowa [mailto:glowa@inac-ainc.gc.ca]

Sent: March 2, 2005 11:06 AM

Subject: **Water License MAC Calculations (Arithmetic mean vs. Geometric mean)**

As per various Water Licenses (in this case industrial) your Maximum Allowable Concentrations (MAC's) is and/or may be defined as:

"The running average of any four consecutive analytical results, or if less than four analytical results collected, and submitted to the Inspector in accordance with the sampling and analysis requirements specified in the SNP".

It has recently brought to my attention that MAC calculations are to be, with the exception of Fecal Coliforms, calculated using the arithmetic method $[(A1+A2+....+AN)/N]$ or what is commonly known as the "average". Fecal coliform MAC's are to be calculated using the geometric method (geometric mean) $[(A1 \times A2 \times \times AN)^{1/N}]$ and is elucidated in the "Guidelines for the Discharge of Treated Municipal Wastewater in the NWT", page 17, section 4.3. In our case the formula will be with four sample results (CFU/dL) and therefore $[(A1 \times A2 \times A3 \times A4)$ to the fourth root]). The fourth root is the same if you hit the second root (square root) button twice.....There is also a formula in excel.

For further clarification/info I have included some additional technical information below that many may prove useful.

Calculating the MAC using the geometric method is useful for parameters that generally fit a logistic/exponential growth curve. In a nut shell the geometric mean is less affected by extreme values than is the arithmetic mean. Everyone knows what I am talking about if they have had to deal with wastewater discharge and "meeting permit requirements"....It has been an, as you say, "up and down" hill battle.

Theoretically the geometric method is ALWAYS \leq the arithmetic method. If sample results indicate higher "precision" (i.e. your results show less variability) your likely hood that either method will give the same result increases (i.e. arithmetic = geometric).

For "less than" (<##) values. There is no doubt that the geometric method does not make sense if any one value is zero so what do we do if our sample result indicates the "Method Detection Limit" (MDL)? For Fecal coliforms it is usually <10 CFU/dL or in increments of but depends on the "accuracy" of the method. Obviously for estimations (MPN/dL) your MDL is going to be generally higher.

For direct counts (CFU/dL), of which all licenses are based on, I understand that the MDL is <10 CFU/dL or could even be as low as one (depends on the dilution of the method). In this case if the sample result comes back at <10 then use "1". It is my understanding that current general southern policies gives permittees the benefit of doubt all the way to the lowest levels when performing calculations using such "less than" values. Therefore, when calculating an arithmetic mean, you may consider a "less than" value as equal to zero (0). As indicated above, for the calculation of a geometric mean, a "less than" value may be considered to be equal to one (1). Remember, this procedure pertains only to the calculation of an average/mean. You must report individual data values (Minimum Detection Limits for a specific Method) on any reports exactly as reported to you by your laboratory.

For "greater than" values (>#####). Such values are only expected (infrequently) in the reporting of Fecal Coliform and (even less frequently) BOD. It is a general "no no" to report a Fecal Coliform value of "Too Numerous To Count" (TNTC). For fecal coliform, "greater than" (> ##,###) values denote at least one, and possibly all volumes of the evaluated sample yielded results outside the method range for accurate counting of the colonies of bacteria (or TNTC). Laboratories should perform enough dilutions to the sample to produce a discreet number as the result of testing. If this is not conducted then the result using the specific method is simply not "accurate". If a "greater than" value is reported, the numeric portion of the value should be sufficiently high so as to make the facility aware of the extent of any problems with disinfection (in many case UV or chlorination/de-chlorination systems).

For both fecal coliform and BOD, the generation of a "greater than" value usually occurs when characteristics of the effluent differ from what is normally produced/discharged. If laboratories "set up" the test procedures based upon normal conditions, they may not have the capacity to get an accurate measurement of higher fecal coliform or BOD concentrations, hence the reported "greater than" value. If you are suspicious or aware of conditions at your plant that cause you to believe effluent pollutant concentrations are beyond their normal levels, you should inform your laboratory of your concern so modifications to testing procedures can be made.

For calculation purposes only, when you report a "greater than" value, the numeric portion of the value should be used to calculate the average (arithmetic or geometric mean).

In summary, I will be enforcing fecal coliforms using the geometric mean and all others using the arithmetic for both Industrial and Municipal undertakings. If, in the past you have used the arithmetic you are still ok as this, in essence, is a more conservative calculation for fecals.

For convenience I have attached a link. I have also attached a .pdf document that I found on the net that seems to be ok.

<http://www.math.toronto.edu/mathnet/questionCorner/geomean.html>

Kevin R. Glowa (M.Sc., R.P.Bio of BC)
Indian and Northern Affairs Canada
North Mackenzie District
Water Resources Officer
P.O. Box 2100 Inuvik NT
Canada XOE OTO

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E-mail: glowak@inac.gc.ca

VIA FAX

Shell Canada Limited



400 - 4th Avenue S.W.
P.O. Box 100, Station M
Calgary, Alberta T2P 2H5
TEL (403) 691-3111

September 16, 2005

Dr. Kathleen Racher
Northwest Territories Water Board
P.O. Box 1326
Yellowknife, NT
X1A 2N9

Dear Dr. Racher

**Subject: Shell Canada Limited Camp Farewell Type B Water License Renewal
Application – Information Request No. 1**

In response to your like captioned letter of September 2, 2005, Shell Canada Limited offers the following information:

1. Section 5.2 Camp Overview

Re: Does this area include all features of the Farewell Camp and Stockpile Site, including the storage area, gravel airstrip and barge-landing site?

The 12.4 hectares includes the camp, storage area, land access and barge landing areas. The airstrip is a separate lease comprised of 18.6 hectares.

2. Section 5.4.4 Wastewater Treatment

Re: Has the camp been at or near full capacity (150 people) since the changes to the sewage treatment system? If so, how has it performed?

To date the treatment plant was only used during the summer of 2002 at which time the maximum number of people was approximately 40-45. We had no indications at the time that capacity design rates are not achievable.

3. Section 5.6.1 Fuel

Re: How will the bermed facilities account for the extra fuel that may be stored within the tanks?

Fuel Storage Tanks are only filled to 85% to allow for expansion and avoid overflows which reduces the useable volumes from 2.4 million liters to 2.0 million liters. In addition, as per the National Fire Code, secondary containment capacity required is 110% of the largest tank (825 m³). Farewell's secondary containment has a capacity (2145 m³) in excess 100% of all the tanks useable capacity that far exceeds these requirements.



4. August 19, 2005 Letter from DIAND – Water Resources Division

Re: Does the wastewater stored in the contingency lagoon get treated once the treatment system is operational?

Once the plant is meeting discharge criteria, the lagoon contents are recycled. As indicated, this can only be performed in the summer. If waste is directed to the lagoon in the winter, and the camp is operating the following summer, the plan is to recycle it then. If the camp is not open, it remains in the lagoon until it meets the License discharge criteria and is then decanted. In all cases, the Inspector's approval is obtained before discharging.

Re: Has Shell ever performed any repairs to their sewage lagoon? If so, what were these repairs, why were they required, and when were they performed?

No repairs have been required to date other than above ground level berm buildup in 2001 at the Inspectors request. Due to its proximity to the channel bank, the monitoring is as much for proactive bank erosion monitoring as it is for actual breaching. As indicated in the Project Description, a plan is in place to close and reclaim the lagoon.

Re: When will Shell Canada be initiating the reclamation of the site? Will Shell be performing any progressive reclamation of the site to deal with areas of impacted sediments and soils?

Shell plans to retain the Farewell site into the foreseeable future. During Niglintgak Development all the useable space at Farewell will be required. We propose to develop a progressive remediation plan, for Farewell, after Niglintgak Development construction is completed. The framework for that plan is likely to be based on a concept similar to "A Federal Approach to Contaminated Sites". Accessible areas would be identified in the plan with proposed timing of remediation. The impacted sediments within the lagoon will be addressed with its closure/reclamation.

Re: When is Shell Canada proposing to do this assessment of the off-base pad area?

The assessment of the area off the gravel base pad (off lease) relates to a significant spill in 1981. Shell was not the owner of the fuel and hence not the Generator of any offsite contamination that may exist as it relates to that spill. Therefore, Shell does not feel it is their responsibility to assess this area.

Re: Does Shell anticipate any lateral movement of contaminants?

It should be noted that the use of CCME guideline for Barium is not appropriate to be applied to barite (barium sulphate) due to the leachability differences. As allowed for in the CCME Guideline, a more appropriate guideline would be "Soil Quality Guideline for Barite: Environmental Health and Human Health"- Alberta Environment. The other drilling product likely mixed with the gravels was bentonite. These two products are not expected to be an issue in respect to lateral movement.

Any other contaminants (with risk of movement) greater than established criteria for the site, would either be remediated or monitored as per an agreed to monitoring plan.

Soil Monitoring as proposed in Section 7.1 of the A&R Plan should include analysis for sodium and potassium.



Agreed – it is normally a part of the salinity package but is not specifically mentioned in the Plan.

The Camp Farewell Emergency Response Plan should include specific details with respect to procedures for spill response for spills on and under ice. As well, the location of the spill response equipment onsite should be identified, in addition to the equipment list.

The Emergency Response Plan is planned for a detailed review in the fourth quarter 2005. Spill response for on and under ice will be incorporated at that time. As well, Mackenzie Delta Spill Response Corporation (MDSRC) is currently developing spill response procedures for the various scenarios for use by its members. Shell is a member of MDSRC. Most of this equipment is owned by the MDSRC, and is mobile, temporary in nature. Attempting to identify in the plan where the response equipment will be located is not possible. When the camp/stockpile is in operation, a MDSRC container or equivalent will be situated onsite. All site personnel will be made aware of the locations onsite during the Orientations. During critical operations, such as fuel unloading, some of the equipment is deployed specific to the task and discussed during the pre-job meeting.

Re: Spill Reporting Requirements

Agreed – The specific Response Plans do have an incorrect reporting threshold and will be corrected in the updated plan by directing the user to the respective protocols.



5. August 24, 2005 Letter from Environment and Natural Resources to the NWTWB

Re:under the Niglintgak Development Plan, it is reasonably foreseeable that the magnitude of the Operations at Camp Farewell, conditional upon approval of the MGP, will considerably increase.

The statement is true if compared to the recent years. Over the existence of Camp Farewell, it has seen high levels of activity, e.g. support for 3 drilling rigs, seismic activities.

Re: Implement an Integrated Waste Management Plan including waste segregation and recycling to minimize the amount of waste disposed of by incineration and open burning.
An Integrated Waste Management Plan is being developed for the Niglintgak Development. Farewell is part of this Plan. Should the Development not proceed, the plan can be modified for Camp Farewell alone. Shell will familiarize camp personnel with selected waste management options during site orientations.

Re: Open burning in a pit or sloop should be restricted to acceptable waste material only – i.e. paper, cardboard, and clean untreated wood.

This is the intent for the sloop. The document “Municipal Solid Wastes Suitable for Open Burning” will be included in the next update of the Operations and Maintenance Manual as part of the Solid Waste Disposal Plan.

Re: The proponent should review the incineration options available and provide justification for the selected device to the regulatory authority. The proponent should also state how compliance with the CWS will be demonstrated. Note: CWS referenced is Canada Wide Standards

It should be noted that the existing, “semi-permanent” camp has a capacity of 35 people. Any capacity above that is accommodated with temporary, contracted camps that supply their own incineration. Shell is a strong advocate of environmental protection and will do whatever is practicable in terms of reduction and segregation. Shell proposes to combine a waste Reduction & Segregation Audit with the Water Use Audit as identified in Appendix B of the Application.

It is questioned why recommendations re: air emissions are being made for a License to withdraw and discharge water. If the intent is to target camp incinerators, then it is suggested that it be accomplished in a process that encompasses all camp incinerators – not only the ones specifically requiring Water Licenses.

The proponent should demonstrate to the regulatory authority that appropriate training will be provided to personnel operating the incinerator.

A written procedure will be developed for the existing incinerator and communicated to the personnel operating it.

The residual ash from incineration may itself contain toxic contaminants and should be assessed in accordance with the NWT Environmental Guideline for Industrial Waste Discharges to determine the appropriate disposal method.

The camp incinerator ash can be analyzed on a one time basis to ensure it meets Schedule III and IV in the Guide however camp incinerator ash does not appear to fit the definition,



within the Guide of industrial waste. "Industrial – Any enterprise involved with manufacturing, fabricating, processing including commercial and Institutional operations."

The proponent should conduct a Phase 3 ESA at the Farewell Camp. If the proponent feels there is sufficient data from the Phase 2 ESA to characterize the site and/or risk to human health and the environment, then the proponent should develop a remedial action plan and begin remediating the large volume of contaminated soil in areas currently accessible.

Shell plans to retain the Farewell site into the foreseeable future. During Niglintgak Development all the useable space at Farewell will be required. We propose to develop a progressive remediation plan, for Farewell, after Niglintgak Development construction is completed. The framework for that plan is likely to be based on a concept similar to "A Federal Approach to Contaminated Sites". Accessible areas would be identified in the plan with proposed timing of remediation. The impacted sediments within the lagoon will be addressed with its closure/reclamation.

As stated in the "Interim Abandonment and Restoration Plan" – Komex International, June 2002 Shell was not the owner/generator of the large offsite spill.

The Proponent is requested to supply:

➤ ***Confirmation that the communities mentioned have authorization to accept waste;***
Although not specifically identified, The Town of Inuvik's Water License does not dis-allow it and does infer acceptability in Part D, 1 where it specifies "The Licensee shall direct all piped and pumpout sewage to the Sewage Disposal Facilities or as otherwise approved by the Board". "Pumpout sewage means all toilet wastes and/or greywater collected by means of a vacuum truck for disposal at an approved facility."

➤ ***Confirmation that the Proponent has received permission from the local communities to transfer proposed waste types and quantities to community waste handling facilities; and***

Due to the discontinuous operation of the camp, permission is obtained on a project basis at the time of execution– not a blanket approval. Permission was granted to the hauling contractor as lately as January 2005 when the camp was open for 48 days. The Town of Inuvik currently allows sewage from outside the town boundaries under By-Law #1945/util/01.

➤ ***Alternate disposal options in the case that communities cannot accommodate the waste.***

Onsite treatment is our primary option and community facilities disposal alternate although the alternate may be chosen for short duration camp activity. We realize that communities may reach capacities at which they can no longer accept outside waste and therefore it is important that Camp Farewell remain as self-reliant as possible in terms of waste management. Future modifications identified for the waste water treatment plant will further reduce the dependency on the community systems. Regulatory pressures to abandon camp waste incineration could foresee ably increase dependency.

The proponent is requested to submit its hazardous waste management practices or plan for the proposed facility and activities showing compliance with the Environmental



Guideline for General Management of Hazardous Waste and the Transportation of Dangerous Goods Regulations (NWT)

An Integrated Waste Management Plan, which includes hazardous materials, is being developed for the Niglintgak Development. Farewell is part of this Plan. Should the Development not proceed, the plan can be modified for Camp Farewell alone. Shell will familiarize camp personnel with selected waste management options.

In the past, "equipment servicing wastes" were collected and transported out of NWT to approved recycling and disposal facilities. This was normally handled under the specific project.

Shell Canada intends to fully meet the requirements of the Guideline for General Management of Hazardous Waste and the Transportation of Dangerous Goods Regulations (NWT).

Plan for and include the locations of hazardous materials and waste storage areas on the site map included in the Emergency Response Plan.

Being a stockpile site and not of continuous operations, it is difficult to identify the locations of hazardous materials within the site in advance. Hazardous waste storage areas will be identified in the next update of the Emergency Response Plan scheduled for Q4 2005.

Re: Emergency Response Plan

Thank you for identifying incorrect names and numbers. These will be corrected in the next update of the Emergency Response Plan scheduled for Q4 2005 and all the numbers will be validated at that time.

A legible site map should be provided that also includes the locations of spill response equipment and all hazardous materials and waste storage areas.

Most of this equipment is owned by the MDSRC, and is mobile, temporary in nature. Attempting to identify in the plan where it will be located is not possible. When the camp/stockpile is in operation, a MDSRC container or equivalent will be situated onsite. All site personnel will be made aware of the locations on site during the Orientations. During critical operations, such as fuel unloading, some of the equipment is deployed specific to the task and discussed during the pre-job meeting. e.g. boom and boat during fuel offloading. The Control Points are identified which was the intent of the map the writer referenced. The recommendation re: hazardous materials and waste storage was addressed in a previous point.

The Sewage Spill Response Plan should also include but not be limited to a clean up strategy in the case of a spill under non-frozen conditions and a Remediation plan for the spill area.

The Sewage Spill Response Plan will be updated to account for non-frozen conditions.



6. **August 26, 2005 Letter from Environment Canada to NWTWB**

The contact spill response number for Environment Canada in the Emergency Contact List should be 920-5181

Thank you for identifying the incorrect number. These will be corrected in the next update of the Emergency Response Plan scheduled for Q4 2005 and all the numbers will be validated at that time.

A review of the WC&GO Response Plan would suggest there is very little expertise on site at any given time and no response equipment is stored downstream of Control Point #1. Nor is there any contingency plan for the transportation of spill equipment (from Camp Farewell or Swimming Point) to appropriate control points in the event of a spill in the Mackenzie River.

The last time the stockpile portion of the site was in operation (2002), all supervisory staff plus some of the other workers were trained in spill response and deployment of the response equipment. The Shell representative on site at that time had 25 years of experience involving emergency response in the Mackenzie Delta as well as other parts of Canada. As can be appreciated, the general work force is transient and of a temporary nature. The Mackenzie Delta Spill Response Corporation (MDSRC) holds two training sessions each year which are open to the general worker population. Shell has also sponsored some people to attend in the past and continue to do so as recently as September 14-15, 2005. As well, the Mission of the MDSRC is to protect the environment by providing spill preparedness and safe, effective response services to the Member Companies i.e. Mutual Aid.

Most of this equipment is owned by the MDSRC, and is mobile, temporary in nature. When the camp/stockpile is in operation, a MDSRC container or equivalent is situated onsite. As well, during critical operations, such as fuel unloading, some of the equipment is deployed specific to the task and discussed during the pre-job meeting. During fuel offloading, in addition to booms around the fuel barges, a secondary boom is deployed at a control point and a boat is at ready. The current activity level does not warrant permanently storing equipment at downstream control points.

When the site is operational in the summer season, a helicopter is on standby at the site, and has moved equipment from Swimming Point to Farewell during exercises. A loader is also situated at Farewell during activity. Transporting additional equipment to the site from other locations is part of the logistical operations.

In the winter, trucks, loaders, and graders are readily available to transport equipment as needed.

Shell Canada is requested to provide a copy of the contractor's fuel handling and spill clean up procedures, and an explanation of how Shell has ensured that the contractor is cognizant of and in adherence to permit conditions.

Shell currently does not have a fuel contractor and therefore cannot supply a copy. In the past, all barged fuel has been transported by NTCL and their response plan is approved by the appropriate regulatory authority. Any fuel supplied by truck in the winter has been subject to a bidding process which results in the contractor being project specific.



CWS requires advance notification in the event the camp becomes active. Note: CWS referenced is Canadian Wildlife Service

Shell will advise CWS in the event the camp becomes active.

It is suggested that all recommendations related to wildlife be addressed as conditions of the CWS Permit rather than in the water license.

If activities are proposed to occur during the breeding season, the proponent should check for active nests of birds and avoid disturbing or destroying them.

Shell has and will continue to do whatever practicable to minimize disturbance of birds and nests. e.g. there have been nests in the past on the landing from the Camp 2nd floor exit. Steps are taken to not disturb them, however, in the event of a fire, the door would be utilized.

The proponent does not mention how they would deal with contaminated snow in their project description.

Contaminated snow will be handled with a method that avoids the situation of waterfowl becoming oiled. Possible methods include an open tank that can be covered for the summer or equipment that melts the snow during the winter operation.

In order to reduce disturbance to wildlife, CWS recommends that aircraft used in conducting project activities maintain a flight altitude of at least 610m during horizontal (point to point flight)

Shell and its contractors will meet the minimum flight altitude specified in the CWS permit for Farewell operation. It is suggested that project requirements should be specified in the project specific permit.

In order to reduce disturbance to resting, feeding or moulting birds, CWS recommends that aircraft used in conducting project activities maintain a vertical distance of 1000m and a minimum horizontal distance of 1500m from any observed concentrations of birds.

Shell and its contractors will meet the minimum distances specified in the CWS permit for Farewell operation. It is suggested that project requirements should be specified in the project specific permit.

Environment Canada recommends that all field operations staff be made aware of the proponents commitments to these mitigation measures and provided with appropriate advice / training on how to implement these measures.

These mitigation measures will be included in the site orientations and posted in the camp.

The proponent must ensure they remain in compliance with the Act and Regulations during all phases and in all undertakings related to the project.

Shell fully intends to remain in compliance with the Migratory Birds Convention Act and Migratory Birds Regulation.

While conducting their operations, the proponent should be aware of the special status, and implement mitigation measures to minimize disturbance to, or contact with, these species.

Shell will communicate the intent of SARA and mitigation measures to site staff.

Shell Canada Limited



The Operations and Maintenance Manual along with the Emergency Response Plan will be updated and forwarded to the NWTWB. The Integrated Waste Management Plan will be available in the first quarter of 2006.

We trust the above adequately responds the questions and recommendations. If additional information is required, please feel free to contact Mr. Randy Hetman Ph:(403) 969-0730, Fax:(403)269-7948 Email:randy.hetman@shell.com or myself as indicated below.

Yours truly

Randall Warren
DAR/Construction Manager
Ph: (403) 691-2521
Fax: (403) 269-7948
Email: (403) randall.warren@shell.com

cc: Mr. Rudy Cockney, INAC
Ms. Mieke Vander Valk, NEB
Mr. Wade Romanko, DOE
Ms. Vanessa Charlwood, CWS
Mr. Bruce Hanna, DFO
Ms. Christine Inglangasuk, EISC
Mr. Randy Hetman, Shell Canada Limited



VIA FAX

400 - 4th Avenue S.W.
P.O. Box 100, Station M
Calgary, Alberta T2P 2H5
TEL (403) 691-3111

October 4, 2005

Dr. Kathleen Racher
Northwest Territories Water Board
P.O. Box 1326
Yellowknife, NT
X1A 2N9

Dear Dr. Racher

**Subject: Shell Canada Limited Camp Farewell Type B Water License Renewal
Application – Information Request No. 2 Response**

In response to your like captioned letter of September 23, 2005, Shell Canada Limited offers the following information:

1. Section 5.2 Camp Overview

Re: we require information on the dimensions/size of the buildings on site. How many permanent and non-permanent buildings are located on site and what is their associated construction materials?

The 35 person, permanent camp has a footprint of 40'x160' and has the typical camp type construction material of wood frame with metal cladding on the exterior. There are three permanent, storage buildings entirely of steel construction. The sizes are 24'x48', 36'x 40' and 40'x81'.

A temporary camp, approximately 40'x110' and 40'x80' is currently onsite and has the typical camp type construction material of wood frame with metal cladding on the exterior.

2. Section 5.4.4 Sewage Treatment

Re: Shell plans to decommission the contingency lagoon and remediate it.

When would remediation take place?

As indicated in the Project Description Section 5.4.4: "When justified by camp use, the installation of a polishing unit will be proposed. Any upgrade would follow the required regulatory notification process. The polishing unit should alleviate the need for storage. Once the effectiveness of the polishing unit is proven, the lagoon can be decommissioned and remediated, as identified in the Interim Abandonment and Restoration Plan (Appendix C)." Once the additional treatment unit is installed, and it can be demonstrated that discharge criteria can be met immediately, it is felt that a lagoon will no longer be required. Once the



decision is made to take the lagoon out of service, initiating remediation would be targeted for the summer following end of service.

An above ground temporary storage tank may be required for short term storage.

How will it be remediated?

As indicated in the Restoration Plan Farewell Camp Section 5.3 and 5.4: "*Treatment of the sediment that has accumulated in the lagoon is required to comply with remedial standards and Inspector concurrence will be sought at the time of lagoon reclamation planning. Prior to remediation, effluent from the lagoon will be required to meet discharge criteria set out in Northwest Territories Water Board Licence # N7L1-1762, Item 4 of Part D before discharging to the Mackenzie River.*

Following lagoon decanting, dewatering of the sludge will be performed using natural air-drying potentially coupled with mixing of absorbents. The depth of the sludge is not expected to exceed 0.5 m and should be mixed in thin lifts to increase drying efficiency. The sludge can be dried in the lagoon and may require mechanical mixing to enhance the drying process.

Air drying is expected to require approximately 3 months with at least 2 of the 3 months having an average daily temperature above 0 °C.; therefore drying should incorporate the months of June to September. Treatment of the lagoon sediment / sludge in this manner negates the need for off-site transport and disposal. Air drying the digested sludge / sediments in this manner constitutes a Process to Significantly Reduce Pathogens (PSRP) as designated by the Environmental Protection Agency (EPA, 1989). Treatment of lagoon sediment / sludge is required to meet Item 6 of Part D of the Water Board Licence, as confirmed by the District Inspector. The process of air drying will also serve to reduce hydrocarbon compounds that are present. As such, the dried sediments are expected to be suitable for subsequent reuse as fill following the drying and treatment process. They could also be beneficially reused as a topsoil amendment as part of site reclamation.

The sewage lagoon should be reclaimed by backfilling the lagoon using the dykes and treated sediments to conform to the surrounding landscape. It may be beneficial to spread alluvial sediments over the prepared grade to approximate the surrounding topsoil conditions."

Where will the new lagoon be located?

There is no intent at this time to construct a new lagoon.

3. September, 2005 Letter from DIAND – Water Resources Division

Re: As the Licensee holder for Camp Farewell, Shell Canada is responsible to ensure that prior to abandonment of the site that any land impacted due to onsite operations, within lease boundaries or not, be restored to any acceptable level as determined by the regulatory authority. As such, complete delineation of any area impacted by a spill originating at Camp Farewell must be performed by Shell Canada to devise a complete abandonment and restoration plan for the site.



Shell Canada will conduct further assessment of the spill area, including the off-base pad area, in 2006.

Shell will update the Farewell Abandonment and Restoration plan to include the off-base area.

4. September 16, 2005 Letter from the Environmental Impact Screening Committee

-that the proponent ensure their fuel berms are capable of containing 110% of any fuel stored in tanks within the berm to avoid any spilling over, and contaminating the area;

Fuel Storage Tanks are only filled to 85% to allow for expansion and avoid overflows which reduces the useable volumes from 2.4 million liters to 2.0 million liters. As per the INAC Lease and the National Fire Code, secondary containment capacity required is 110% of the largest tank (825 m³) not of all fuel stored in tanks. Farewell's secondary containment capacity (2145 m³) is roughly 107% of all the tanks useable capacity, far exceeds these requirements and is close to EISC's recommendation.

Re: that the proponent haul grey water to the Inuvik sewage treatment plant for disposal if requirements are not met. This would prevent any contamination of the environment and wildlife.

Shell assumes this recommendation is intended to not have grey water sprayed on land at Farewell. Under this license application, Shell is prepared to meet this requirement.

Re: that the proponent observe the recommendations in the Environmental Protection Branch, Environment and Natural Resources, and Indian and Northern Affairs(Water Resources) letters, that the remediation and reclamation plan be updated; that the proponent have an adequate Emergency Response Plan, with personnel who are well trained and practiced in case of emergency. The proponent should have in place and be prepared to deploy in a timely fashion the necessary emergency equipment. This would prevent time being lost in the event of an emergency, thus limiting any potential contamination of the environment.

Shell is prepared to review and update the Abandonment and Restoration plan and submit it to the NWTWB within one year of license issuance. This would provide time to conduct additional soil sampling if required.

Shell provided a comprehensive response to Information Request No.1 regarding Environment Canada's statement suggesting an inadequate Emergency Response Plan and expertise on site. Unfortunately, it was not available in time to the EISC for their September meeting. Please refer to our letter of September 16, 2005. Shell believes it has an adequate response plan that has been approved by Canadian Coast Guard although improvements are always possible. As indicated in the response, we had experienced personnel on site, conducted training and held an exercise when the stockpile was in operation. We will continue to ensure adequate response plan and expertise is available. We are also currently in the process of reviewing and updating the Farewell Emergency Response Plan and will incorporate the recommendations as indicated in our response to Information Request No 1. It will be submitted to the NWTWB as well as INAC and Transport Canada – Marine Safety.

Shell Canada Limited



We trust the above adequately responds the questions and recommendations. If additional information is required, please feel free to contact Mr. Randy Hetman Ph:(403) 969-0730, Fax:(403)269-7948 Email:randy.hetman@shell.com or myself as indicated below.

Yours truly

A handwritten signature in black ink, appearing to read "R. Warren", written over a large, stylized loop.


Randall Warren
DAR/Construction Manager
Ph: (403) 691-2521
Fax: (403) 269-7948
Email: (403) randall.warren@shell.com

cc: Mr. Rudy Cockney, INAC
Ms. Anne-Marie Buchwald, NEB
Mr. Wade Romanko, DOE
Ms. Vanessa Charlwood, CWS
Mr. Bruce Hanna, DFO
Ms. Christine Inglangasuk, EISC
Mr. Randy Hetman, Shell Canada Limited



**SHELL CANADA LIMITED
FAX COVERSHEET**

Page 1 of 5
Includes coversheet

SEND TO		FROM	
ATTENTION: Dr. Kathleen Racher, NWTWB Mr. Rudy Cockney, INAC Ms. Anne-Marie Buchwald Valk, NEB Mr. Wade Romanko, DOE Ms. Vanessa Charlwood, CWS Mr. Bruce Hanna, DFO Ms. Christine Inglangasuk, EISC		 R. (Randy) H. Hetman Sr. Consultant to Shell Canada Ltd Shell Canada Limited 400 - 4th Avenue S.W. P.O. Box 100, Station M Calgary, Alberta T2P 2H5 Business: (403) 969-0730 Cell: (403) 969-0730 Fax: (403) 269-7895 (403) 269-7948 Email: randy.hetman@shell.com	
COMPANY:			
DATE: October 4, 2005	LOCATION:		
FAX NO:	TELEPHONE NO:		
SUBJECT: <i>Shell Canada Limited Camp Farewell Type B Water License Renewal Application Response to Information Request No. 1</i>			

DESCRIPTION / REMARKS:

Attached is for your information is Shell Canada Limited's response to the like subject Information Request No. 1.

Regards,
Randy Hetman

SCHEDULE III
(Subsection 6 (1))

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE OR RENEWAL OF LICENCE

APPLICATION/LICENCE NO. N7L1-1762
(amendment or *renewal* only)

1. NAME AND MAILING ADDRESS OF APPLICANT

Shell Canada Ltd.
400 - 4th Avenue S.W.
P.O. Box 100, Station M
Calgary, AB T2P 0J4
Attn: Randall Warren

Telephone: 403-691-2521

Fax: 403-269-7948

2. ADDRESS OF HEAD OFFICE IN CANADA IF
INCORPORATED

Same as previous

Telephone:

Fax:

3. LOCATION OF UNDERTAKING (describe and attach a map, indicating watercourses and location of any proposed waste deposits)

Camp Farewell: east shore of the MacKenzie River - Middle Channel, 50 km downstream from Tununuk Point (Bar C)

Latitude: 69 12' 30" N

Longitude: 135 06' 04" W

4. DESCRIPTION OF UNDERTAKING (describe attach plans)

Renewal of water license for the permanent camp, Camp Farewell: please refer to attached documents.

5. TYPE OF UNDERTAKING

1. Industrial

2. Mining and milling

3. Municipal X

4. Power

5. Agriculture

6. Conservation

7. Recreation

8. Miscellaneous (describe)

6. WATER USE

To obtain water X

to cross water course

to modify the bed or bank of watercourse

Flood control

To divert water

to alter the flow of, or store, water

Other (describe) Release treated wastewater into the MacKenzie River, Middle Channel

7. QUANTITY OF WATER INVOLVED (litres per second, litres per day or cubic metres per year, including both quantity to be used and quality to be returned to source)

Quantity of water used not to exceed 150 m³/day; to be withdrawn from the Middle Channel of the MacKenzie River during winter activities, and the Unnamed Lake to the north in the summer.

Treated wastewater will be discharged to the MacKenzie River (150 m³/day) provided discharge criteria are met.

SCHEDULE III - Concluded

APPLICATION FOR LICENCE, AMENDMENT OF LICENCE, OR RENEWAL OF LICENCE - Concluded

8. WASTE DEPOSITED (quantity, quality, treatment and disposal)

Approximately 150 m³/day of effluent to be deposited. Sewage and greywater to be treated using the existing Extended Aeration Sewage Treatment System. The effluent discharged to the MacKenzie River will comply with the effluent quality requirements listed in the amendment to License N7L1-1762, dated November 28, 2001, and with the requirements outlined in the Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories.

9. OTHER PERSONS OR PROPERTIES AFFECTED BY THIS UNDERTAKING (giving name, mailing address and location; attach list if necessary)

N/A

10. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION

Please see attached documents.

11. CONTRACTOR AND SUB-CONTRACTORS (names, addresses and functions)

Camp is to be used to support future research, exploration and development activities in the Mackenzie Delta.

12. STUDIES UNDERTAKEN TO DATE (attach list if necessary)

Enhanced Phase I Environmental Assessment - Golder & Associates
Enhanced Phase I Environmental Assessment - Inuvialuit Environmental Inc.
Phase I and II Environmental Site Assessment - Komex Environmental Ltd.

13. PROPOSED TIME SCHEDULE

Project time scheduling is on-going with no completion date; Shell is requesting a 5 to 10 year water license term.

Start date: December 1, 2005 Completion date: On-going

NAME (Print)

TITLE (Print)

SIGNATURE

DATE

FOR OFFICE USE ONLY

APPLICATION FEE

Amount: \$

Receipt No.: _____

WATER USE DEPOSIT

Amount: \$ _____

Receipt No.: _____

NORTHWEST TERRITORIES WATER BOARD

Water License Application Questionnaire For Municipal Undertakings

SECTION A - GENERAL

1. **Date:** July 14, 2005
2. **Applicant:** Shell Canada Limited
3. **Contacts:** Randall Warren
4. **Community Status:** Permanent field camp
5. **Population (according to most recent census results), and the Estimated Growth Rate over next five years:**
Camp Farewell can accommodate 150 people.
6. **Indicate the Status of the municipality's license on the date of application:**
Not applicable
7. **Has any baseline data been collected for the main water bodies in the area?**
No

If yes, please attach all data gathered on the physical, biological and chemical characteristics at each sampling location.

Attach a summary or program details indicating sampling locations, description of waste at each location, sampling frequency, and parameters analyzed.

Include an outline of Quality Assurance/Quality Control methods being applied to sampling, preservation and analysis within the program.

8. **Has any baseline data collection and evaluation been undertaken with respect to the various biophysical components of the environment potentially affected by the project (e.g. wildlife, soils, air quality), in addition to water related information requested on this questionnaire?**
No

9. **Attach detailed maps which show the relative locations of the:**
 - a. raw water intake
 - b. water treatment facilities
 - c. fuel & chemical storage
 - d. sewage treatment facilities
 - e. wastewater treatment area and discharge outlets
 - f. solid waste disposal areas and drainage patterns
 - g. hazardous waste disposal area
 - h. transportation access routes
 - i. existing water bodies/courses and any changes to these water bodies/courses which have or may occur as a result of water use or waste disposal facilities, locations of environmental monitoring sites.

Refer to the site plan located in the attached Project Description (Figure 5-1).

- 10. Attach detailed scale plan drawing(s) of the proposed (or present) sewage treatment system. The drawing(s) must be stamped by an engineer registered in the NWT and include the following:**
- a. details of pond size and elevation**
 - b. precise details of all retaining structures (dimensions, materials of construction, etc.)**
 - c. details of the drainage basin, and existing and proposed drainage modifications**
 - d. details of all decant, siphon mechanisms, etc., including sewage treatment facilities**
 - e. details regarding direction and route followed by wastewater flow from the area**
 - f. indications of the distance to nearby major watercourses, and fish bearing waters**
 - g. location and construction of liners**
 - h. leachate and groundwater collection systems, and**
 - i. control structures**

Refer to the Water Management Plan located in Appendix B of the attached Project Description, and Sections 2, 3 and 4 of the attached Operations and Maintenance Plan.

- 11. Attach detailed scale plan drawings of the proposed (or present) solid waste disposal area. The drawings must include the following:**
- a. precise details of all retaining structures (dimensions, materials of construction, etc.)**
 - b. details of the drainage basin, and existing and proposed drainage modifications**
 - c. details regarding direction and route followed by waste water flow from the area**
 - d. indications of the distance to nearby major watercourses, and fish bearing waters**
 - e. all sources of seepage presently encountered in the vicinity of these areas**
 - f. the volume of each seepage flow (m³/day), and**
 - g. the direction of each flow**

There is no solid waste disposal area located at Camp Farewell.

- 12. Describe the present or proposed contingency plan which will be used for each portion of the waste control system in the event it fails to operate properly.**
Refer to the Emergency Response Plan for Camp Farewell in Section 7 of the attached Operations and Maintenance Plan. If the sewage treatment plant fails, sewage can be diverted to the lagoon or trucked .
- 13. Attach the present or proposed spill contingency plan, which will be employed in case a spill of hazardous materials occurs. Describe courses of action, mitigative methods and equipment available for use.**
Refer to the Emergency Response Plan for Camp Farewell in Section 7 of the attached Operations and Maintenance Plan.

SECTION B - WATER SUPPLY

1. **Volume of Water Use:** 150 m³/day
2. **Type of source:** fresh water lake / river
3. **Name of raw water source and alternative, if any:**
Unnamed Lake in the summer and the Mackenzic River in the winter.
4. **Usual break-up and freeze-up months:**
Break-up: late April Freeze-up: October
5. **Please provide short descriptions for the following:**
 - a. **Freshwater intake facility**
 - b. **Operating capacity of the pumps used**
 - c. **Intake screen size**Refer to the Water Management Plan located in Appendix B of the attached Project Description
6. **Type of water storage facility:**
Tank
7. **What is the capacity of the storage facility? (m3)**
27.25 m³ tank
8. **What is the rate of withdrawal from the source? (m3/day)**
150 m³/day
9. **Water is drawn from the source:**
Yes
10. **What is the rate of flow of source (if river) or size (if lake)?**
Unknown
11. **At the intended rate of water usage, describe the effects on the river or lake from which water will be drawn.**
The impact of water withdrawal on the Mackenzie River and on Unnamed lake is expected to be negligible.
12. **General condition of:**
 - a. **Water supply facility**
 - b. **Storage facility**
 - c. **Distribution system**Good
13. **Are there any changes planned in the water supply system?**
No

SECTION C - WATER TREATMENT

1. Indicate the quality of the raw water prior to treatment and distribution.

 X Good Fair Poor

2. Indicate the capacity of the treatment facility. (L/minute)

The treatment facility is essentially a tank where solids are allowed to settle out. The capacity of the tank is 27.25 m³.

3. Type of water treatment facility:

Gravity separation of solids

4. Describe in detail the method of water treatment (i.e. backwash, flocculation, sedimentation, chemicals used), and provide the results of the most recent bacteriological and chemical analyses. Attach a diagram if possible.

Sedimentation

5. Have there been any problems or health and environmental concerns with the water treatment facilities?

No

6. Are there any changes planned in the water treatment facilities?

Depending on future use of the camp, an upgrade to the water treatment system would be considered, to ensure water withdrawn meets drinking water criteria. Any proposed upgrade would follow the normal regulatory review process.

SECTION D - SEWAGE DISPOSAL

1. **Indicate level of treatment the sewage will be receiving:**
2. **Indicate the capacity of the sewage treatment facility. (m3)**
3. **Indicate the retention time of the sewage while in the treatment facility.(days)**
For questions 1-3 refer to the Water Management Plan located in Appendix B of the attached Project Description, and Sections 2, 3 and 4 of the attached Operations and Maintenance Plan.
4. **Indicate the estimated rate of discharge of waste water.**
150 m³/day
5. **Indicate the location of the discharge point.**
Refer to the site plan included in the Water Management Plan, Appendix B in the Project Description.
6. **Will the discharge be seasonal or continuous?**
Discharge will be seasonal while the camp is in operation.
7. **Comment on the general condition of the: Sewage collection system, discharge control system, dams, diversions, dykes or berms**
According to the latest inspection report dated January 19, 2005, the waste disposal features were inspected and found to be acceptable.
8. **Have there been any problems or health and environmental concerns with the sewage disposal facilities?**
Prior to installation of the current extended aeration sewage treatment system, a RBC treatment system was in place. Due to difficulties in meeting discharge criteria the RBC system was replaced with the current system.
9. **The average depth of the wastewater lagoon is:**
The average depth of the lagoon is unknown. The lagoon currently only contains spring run-off seepage. Prior to it reaching the 1 meter freeboard, the contents are tested, treated if required, and then decanted when the contents meet discharge criteria.
10. **What is the design freeboard?**
1 m
11. **Is there any harvesting of fish or shell fish in the waters where waste is discharged?**
Fishing for recreational purposes only.
12. **Will the municipality be using a honey bag pit?**
Not applicable
13. **Are there any sources of commercial or industrial liquid waste being discharged or deposited to the municipal system, which may affect the quality of the effluent or leachate produced?**
No, the sewage treatment system is a closed system for camp purposes only.

14. Have any spills occurred in the past five years?

No

15. Have there been any operating problems with the lagoon?

No

16. Are there any changes planned in the sewage disposal facilities?

Depending on future use of the camp, an upgrade to the sewage treatment system would be considered. The upgrade would be the installation of a Polishing Unit. Any proposed upgrade would follow the normal regulatory review process.

SECTION E - SOLID WASTE DISPOSAL

This section does not apply to Camp Farewell as there is no solid waste disposal site present. Combustible camp garbage is incinerated on site. Once approval is obtained the ash is hauled to the landfill in Inuvik. Non-combustible solid waste is stored on site for transport to Inuvik for landfill disposal as well.

- 1. Indicate the capacity of the disposal area. (m3)**
- 2. The average depth of the solid waste disposal site is:**
- 3. Are there any sources of commercial or industrial solid waste being deposited in the municipal system which may affect the quality of the effluent or leachate produced?**
- 4. Briefly describe how the solid waste will be picked up and delivered to the disposal area.**
- 5. Is the solid waste site fenced?**
- 6. Will the municipality be using a dead animal pit?**
- 7. Will the municipality be using a bulky metal waste disposal area?**
- 8. Will the municipality be using a hazardous waste disposal area?**
- 9. Are there any hazardous commercial wastes entering the solid waste disposal system?**
- 10. If any natural watercourse may gain access to the proposed solid waste disposal area, what methods will be used to decrease the amount of runoff water entering these areas? Indicate the volume of water which may enter these areas from the source(s) in question and attach all pertinent details of proposed diversions.**
- 11. Please describe the nature of any diversion of watercourses.**
- 12. Have there been any problems or health and environmental concerns with the solid waste disposal facilities?**
- 13. Are there any planned changes to the solid waste disposal system?**

SECTION F - ABANDONMENT AND RESTORATION PROGRAM

- 1. List and describe the locations of abandoned or restored water treatment facilities.**
Not applicable
- 2. List and describe the locations of abandoned or restored sewage treatment facilities.**
The previous sewage treatment system, an RBC system, was replaced by the current extended aeration sewage treatment system in the summer of 2002. The RBC facilities were removed from the site.
- 3. List and describe the locations of abandoned or restored solid waste disposal facilities.**
Not applicable
- 4. Do you have an abandonment and restoration plan?**
Yes , refer to Appendix C of the Project Description for the Camp Farewell Abandonment and Restoration Plan.

SECTION G - WATER QUALITY MONITORING PROGRAM

- 1. Briefly describe the methodology that is presently used to sample the raw water supply.**
There is no sampling of the raw water supply because this is a pristine and undisturbed water source that is used only for domestic purposes and not as a potable water source.
- 2. Briefly describe any monitoring that is done on wastewater effluent and leachate.**
Shell complies with the requirements of the Surveillance Network Program outlined in its current Water License N7L1-1762. The current license and amendments are provided in the Water Management Plan included in Appendix B of the attached Project Description.
- 3. Recognized laboratory performing analysis of samples:**
Taiga Environmental Laboratory
- 4. Are any changes planned in the water quality monitoring program?**
No, unless required by the Northwest Territories Water Board.

SECTION H - ENVIRONMENTAL ASSESSMENT AND SCREENING

- 1. Has this project ever undergone an initial environmental review, including previous owners?**

The existing water license was issued for Camp Farewell on December 1, 2000, with an amendment issued on November 28, 2001.

- 2. Has approval been obtained or sought from the Department of Fisheries and Oceans for using any fish bearing water bodies for containment or disposal of waste?**

Not applicable

- 3. Are there any environmental studies ongoing or planned?**

A Water Use Audit will be conducted the next time Camp Farewell is in operation. The Audit is an important part of Shell Canada's water conservation planning.

CAMP FAREWELL OPERATIONS & MAINTENANCE PLAN

Solid Waste Disposal Plan

Solids designated for disposal and the disposal options varies depending on the material. Six major solid waste streams have been identified and the disposal plans are addressed as follows:

Combustible camp waste will continue to be burned in the incinerator located within the camp.

The larger construction debris (pallets etc) that was previously burned in an earthen pit onsite will now be burned in a metal sloop. This will contain the fire and eliminate the introduction of waste materials to the soil. The residual ashes from the incinerator and burn sloop will be tested, and if suitable, transported to the Inuvik landfill for final disposal after obtaining appropriate approval. See the attached "Municipal Guidelines for Open Burning" for materials that are appropriate for open burning.

Recyclable materials will be collected and recycled. Materials including, but not limited to used oil, used anti-freeze, oily rags, etc. will be shipped to suitable facilities located in Alberta. Metal including aluminum and scrap steel are separated into bins that will be shipped from the location to appropriate recycling facilities.

Un-usable drilling products including, but not limited to cement, potash, caustic soda, etc. are either recycled or shipped to appropriate disposal facilities in Alberta. Consideration should be given to minimizing packaging when planning these types of supplies. Eg bulk product in seacans.

At Reclamation of the Lagoon: Upon approval of the District Inspector, the digested sludge and sediment that has accumulated in the sewage lagoon is to be air dried to reduce hydrocarbons and pathogens. The sediment can then be used onsite as fill or as a topsoil amendment as a component of site reclamation. See Camp Farewell Reclamation Plan, submitted under separate cover, for additional details.

A Waste Reduction and Segregation Audit is to be conducted after the camp has been operating for a reasonable time however these aspects need to be included in the project planning.

All solid waste materials will be managed and disposed of in accordance with Northwest Territories Regulations and Guidelines.

The Integrated Waste Management Plan will replace this section when it becomes available.

Municipal Solid Wastes Suitable for Open Burning

Municipal solid wastes (MSW) that are conditionally suitable for open burning are paper products, paperboard packaging and untreated wood wastes only.

Conditions for this burning are:

- * The principle of source reduction should be utilized to reduce, reuse and recycle materials otherwise bound for landfill.
- * The appropriate materials are segregated and burned in a controlled manner and site which is separate from the working landfill so that the fire cannot spread. Standard burning conditions shall apply to burning such as on days where winds are light, blowing away from the community, in manageable volumes so that fires do not get out of control, having applicable permits and managed by an authorized, qualified person from the community. These are conditions also recommended in the Municipal and Community Affairs Solid Waste Modified Landfill Guidelines.
- * Building demolition wastes should not be burned unless they have been sorted to remove non-wood wastes such as roofing materials, electrical wire, plastics, asbestos and other non-wood wastes.
- * Waste wood treated with preservatives such as creosote, pentachlorophenol or heavy metal solutions shall not be burned. Examples of treated wood materials include railroad ties, telephone/hydro poles, pilings, cribbing and foundations.
- * Following a review of the specific landfill location, additional local conditions or controls may be applied.

Where geographic conditions do not allow for the proper operation of a modified landfill, such as because of limited availability of cover materials and unsuitable ground conditions, communities may have to assess other alternatives of MSW management ie: balefill, incineration. The open burning of non-segregated MSW remains an unacceptable option for the management of MSW. Continuation of this practise should not be allowed unless a site-specific assessment fails to identify a feasible and practical alternative. At that point some form of segregation will be required.

18 October 1993

Environmental Protection Division



RADIO LICENCE

Issued under the authority of the Minister of Industry in accordance with the Radiocommunication Act and Regulations made thereunder

EFFECTIVE DATE	EXPIRY DATE	ACCOUNT NUMBER
October 2, 2002	March 31, 2006	26-080000555

RADIOCOMMUNICATION USER

SHELL CANADA LIMITED/ WIRELESS TECH
SERVICE IAN LUCAS RM 1720(MW/L)
P.O. BOX 100, POSTAL STATION "M"
CALGARY AB T2P 2H5

THIS LICENCE AUTHORIZES THE OPERATION OF THE STATION LISTED BELOW

NUMBER TYPE	CALL SIGN	STATION LOCATION COORDINATES	ZONE
4932440 FIXED	CFD38	FARWELL BASE CAMP	NON-METROPOLITAN ZONE C
		LATITUDE 69 12 30 N	LONGITUDE 135 06 00 W

TRANSMITTING FREQUENCIES	RECEIVING FREQUENCIES	CHANNEL TX RX	BANDWIDTH AND EMISSION	POWER	POWER TYPE	AUTHORIZED COMMUNICATIONS AND CONDITIONS
130.27500 MHz	130.27500 MHz	01 01	6K00 A3E	22.909 W	ERP	LICENCED STATIONS

SERVICES

T LAND/MOBILE

RADIO LICENCE

Issued under the authority of the Minister of Industry in accordance with the Radiocommunication Act and Regulations made thereunder

ACCOUNT NUMBER	LICENCE NUMBER
26-080000555	4932440

LICENCE ADDENDA

This licence authorizes the licensee to establish and operate a radio station as described in the approved application, in accordance with specific items or conditions and applicable provisions of the Radiocommunication Act and its regulations. This authority should not be construed as approving the use of any antenna supporting structure which has not been approved by the Department of Transport from an aeronautical safety point of view. Except as provided in the regulations, no change in the apparatus or operations shall be made without the authority of the Minister, Industry Canada, and the licensee shall notify the Department in writing upon a change of address.

The Department may, at a future date, require the licensee to install filters, tone coding devices, reduce the effective radiated power and/or antenna height as appropriate.

Service Category indicates the categories of service the station is authorized to perform.

In many cases licence fees are related to the number of transmit and receive channels. A code, used in the "channel" column, indicates the number of equivalent voice channels as given in the following table:

Channel Code	1 to 9	A	B	C	D	E	F	G	Other Letters H, I, J, etc.
Equivalent No. of Voice Channels	1 to 9	10 to 24	25 to 60	62 to 120	121 to 300	301 to 600	601 to 960	961 to 1200	Measured in units of 300 channels

For further information regarding your radio licence please contact your nearest Industry Canada District Office. The Radiocommunication Act and the Radiocommunication Regulations are available on Internet at:

http://strategis.ic.gc.ca/sc_mrksv/spectrum/engdoc/spect1.html

ENQUIRIES CONCERNING THIS RADIO LICENCE SHOULD BE DIRECTED TO INDUSTRY CANADA DISTRICT OFFICE,
401 - 4920 52ND STREET, YELLOWKNIFE, NT, X1A 3T1, TEL. (867) 920-6603 FAX (867) 920-6601.
E-mail : spectrum.yellowknife@ic.gc.ca