

Shell Canada Limited



400 - 4th Avenue, S.W.
P.O. Box 100, Station 1
Calgary, Alberta T2P 2H5
TEL (403) 691-3111

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File-	1762

November 27, 2001

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



1693001106644
NOV 30 2001
YELLOWKNIFE, NWT

Subject: Shell Farewell Water License N7L1-1762

In accordance with the subject License, please find attached the following documents:

1. Abandonment and Reclamation Plan titled "Reclamation Plan – Shell Farewell Water System" – Komex International Ltd
2. Operation and Management Plan for the Sewage and Solid Waste Treatment Facilities
3. Notification and description of proposed modification to the treatment system.

Should additional information be required, please contact the undersigned at (403) 691-2521 or randy.hetman@shell.ca.

Yours truly,

R. (Randy) H. Hetman
DAR/Construction Manager

cc- Inspector – Inuvik District Office, DIAND (w/attachments)

Attachments

Shell Canada Limited



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

CAMP FAREWELL

OPERATIONS AND MAINTENANCE PLAN

SEWAGE AND SOLID WASTE TREATMENT FACILITIES

NOVEMBER, 2001



1	OPERATIONAL PLAN
2	RBC – GENERAL DESCRIPTION
3	RBC – EQUIPMENT DRAWINGS
4	RBC – OPERATIONS & MAINTENANCE GUIDE
5	MODIFICATIONS
6	QA/QC PLAN
7	CONTINGENCY PLAN
8	LICENSE N7L1-1762
9	
10	



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 RBC unit.

Modifications

- The Board must be notified 45 days prior to beginning modifications. Notification for the upcoming mod was done Nov. 30, 2001.
- Upgrade to Sewage Treatment Plant for winter operating season 2001/2002 will include a 4000 gallon trash and settling tank and a 4000 gallon equalization which will have aeration to aid the treatment process.
- 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.
- When discharging continuously from the RBC, 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 manufacturers operation and maintenance manual.
- Monitor sediments in tanks and remove with vacuum truck as required and transport 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.

Camp Farewell
Water License Field Requirements

Check List

	Circle appropriate answer	<u>Date</u>	<u>Initials</u>
1. Copy on site: License	Yes / No		
Contingency Plan	Yes / No		
QA/QC Plan	Yes / No		
2. Five Day Notice to Inspector Prior to Discharge	Yes / No		
3. Screened Water Intake	Yes / No		
4. Discharge Sample Point Sign in place w/ "1762-1 Treated Effluent Discharge Sample Point"	Yes / No		
5. Volumes of Water withdrawn for the camp are recorded	Yes / No		
6. Treatment Facilities were modified. If yes: Describe: 45 Day Notice given. As-builts submitted within 90 days of completion	Yes / No Yes / No Yes / No		

Biweekly Discharge Samples

	<i>Date Sampled</i>	<i>Sampler</i>		<i>Date Sampled</i>	<i>Sampler</i>
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

Fill in the Number of Loads for Camp Use Only

Truck Volume: _____ m3 per load.

Date	January	February	March	April	May	June	July	August	September	October	November	December
1												
2												
3												
4												
5												
6												
7												
8												
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23												
24												
25												
26												
27												
28												
29												
30												
31												
Total Loads												
Total M3												

Fax to: Shell Canada Limited, DAR/Construction Manager on the first of every month @ (430) 269-7948

Was. Water Disposal Volumes

Camp Carewell

Water License Field Requirements

Year: _____

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												
2												
3												
4												
5												
6												
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30												
31												
Total M3												

Fax to: Shell Canada Limited, DAR/Construction Manager on the first of every month @ (430) 269-7948

Rotating Biological Contactor

Waste Water Treatment System

General Description

The RBC System

Aerobic digestion of organic based contaminants is employed as the main treatment process within the treatment plant. Digested sludge clarification and final effluent disinfection complete the treatment process operations.

The weight of the treatment plant and building is equally distributed over a skid base structure. The skid base is typically constructed of four (4), 0.36 m (14 in) deep "I" beams with cross members designed to be hauled on a conventional oilfield heavy hauling truck and trailer.

The plant, measuring 4.7 m long (15 feet) by 2 m wide (6.5 feet) by 1.2 m high (4 feet), is enclosed within an all weather heated skid mounted steel building. The electrical control panel for the plant operation and forced air heater are housed within the building. The building, measuring 10.5 m long (35 feet) by 3 m wide (10 feet) by 2.6 m high (8.5 feet) is supported on four steel beam skids running its length. Power to operate the plants heating and control system is supplied by the camp generating facility. A backup generator can be included with the design of the system if requested.

The camp wastewater outfall line typically discharges to a 3' x 2' x 3' aluminum 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 effluent to the inlet connections on the RBC plant.

The influent flows into the primary tank of the system. This internally coated, welded steel tank has an approximate holding capacity of 2.1 m³ (450 imperial gallons) designed to allow settling of particulate matter. Liquids and entrained particles overflow into the aeration chamber. The overflow point between the tanks is situated to provide maximum volume and retention time within the primary to promote particle settling. The primary tank, under ideal normal operating circumstances, is not aerated allowing the digestion process to be initiated under anaerobic conditions.

The aerobic chamber, similar in volume capacity to the primary, is designed to pre-aerate the fluid prior to its introduction into the biozone. A regenerative blower delivers air to the tank contents through a system of lateral pipes perforated every 10 cm. Pre-aerating the wastewater prior to it being fed into the biozone tank, initiates the digestion process and bacterial.

The fluid from the aeration chamber is delivered to the biozone through a bucket feed assembly. Four arms extending outward from a central rotating wheel continuously rotate through the aeration tank volume. Each arm, made of 10 cm (4") welded steel pipe, rotates through the fluid drawing a volume into it. As the arm rotates out of the fluid and reaches the upper portion of its travel arc, the volume gravity flows out the opposite end of the pipe into the biozone.

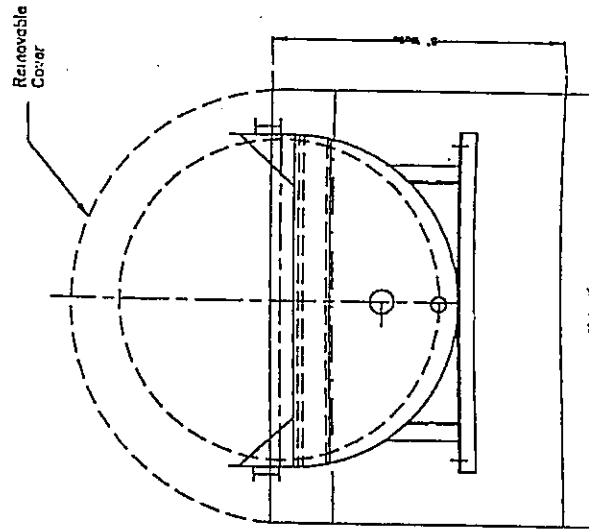
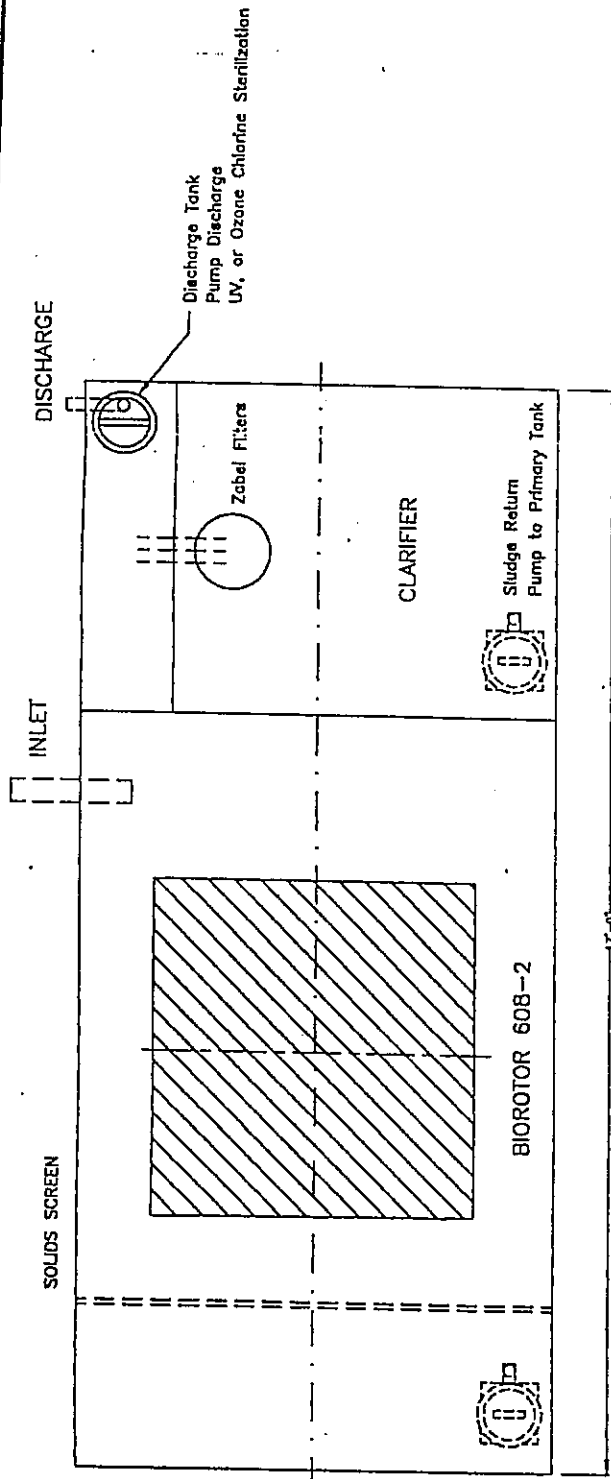
The bucket feed system allows for measured volumes to be directed to the biozone. This prevents the bacterial activity from being "shocked" due to rapid changes in influent volume and wastewater quality. Each of the four arms is removable to allow for greater pre-aeration and prolonged biological digestion times within the biozone.

The semi circular biozone tank houses the biorotor. The biorotor is made up of several inert PVC tubes solvent welded together into "media blocks". These blocks are designed to increase the surface area upon which the digestion process takes place.

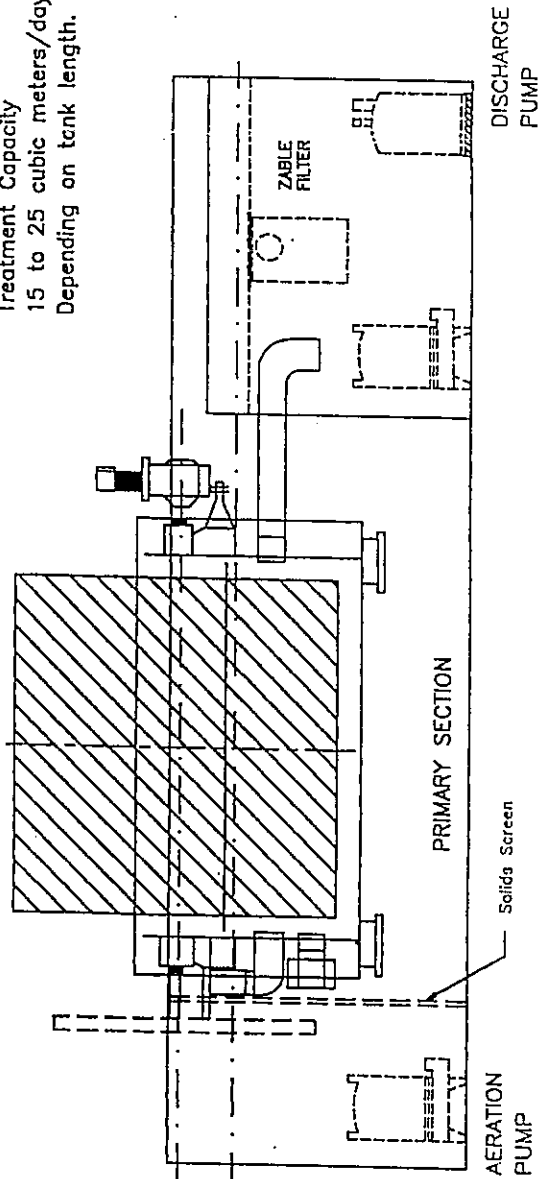
Each block is positioned in a circular pattern around a central shaft. Successive blocks are placed together running the length of the shaft and stacked in rows, building up the biorotor media to a depth of 0.9 m (3ft). The total approximate surface area of the biorotor media is 930 m² (10,000 ft²).

Wastewater Treatment Facility – 40 to 130 Camp Residents

is of utmost importance. For full details on sampling and analysis, refer to License N7L1-1762 and the approved QA/QC Program.



Treatment Capacity
15 to 25 cubic meters/day
Depending on tank length.

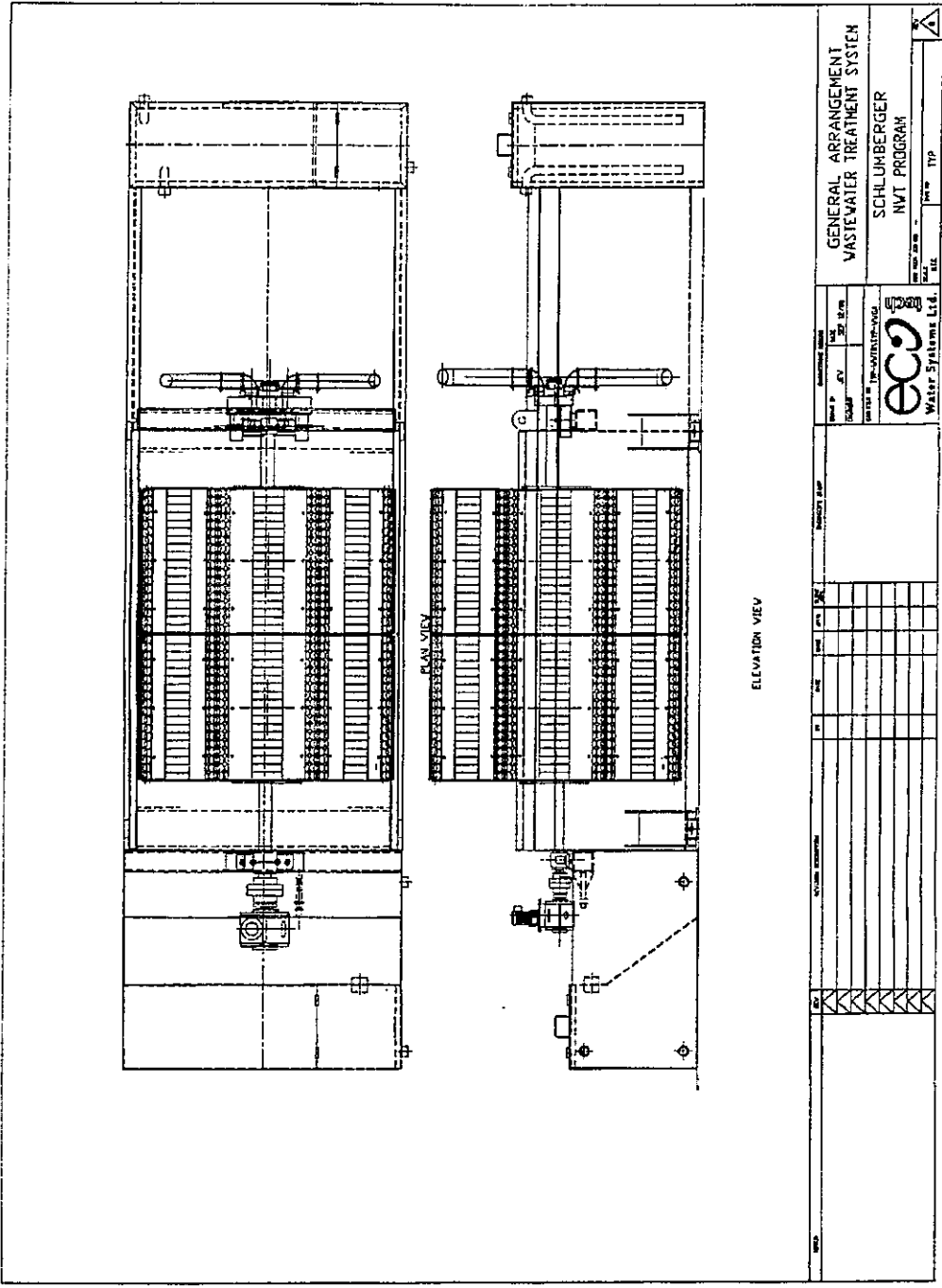


MOBILE SEWAGE TREATMENT PLANT

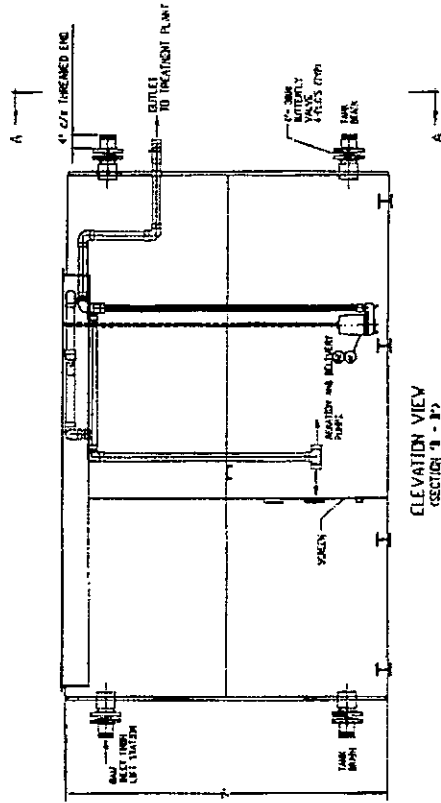
GENERAL ARRANGEMENT

DATE: 01/26/1988 DRAWN BY: ARJAL PROJECT NO.: 1 OF 2

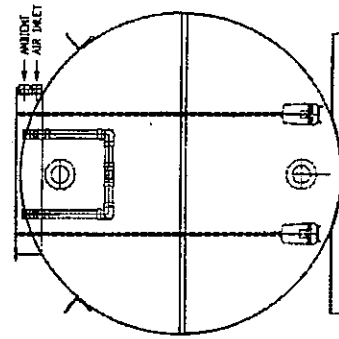
RBC-1575



GENERAL ARRANGEMENT WASTEWATER TREATMENT SYSTEM	
SCHLUMBERGER NVT PROGRAM	
Water Systems Ltd.	
DATE: 11/11/88	
BY: [Signature]	
TYP: [Signature]	
SCALE: 1/2" = 1'-0"	
SHEET NO. 1 OF 1	
PROJECT NO. [Blank]	
CLIENT: [Blank]	
LOCATION: [Blank]	
DESCRIPTION: [Blank]	
REVISIONS: [Blank]	
APPROVED: [Blank]	
DRAWN: [Blank]	
CHECKED: [Blank]	
DATE: [Blank]	



ELEVATION VIEW
(SECTION 'B' - 'B')



SIDE VIEW
(SECTION 'A' - 'A')

PRIMARY AND SURGE
WASTEWATER HOLDING TANK

TYPICAL
12,000 US GALLONS

0
HP 40

Rotating Biological Contactor

Waste Water Treatment System

Operations and Maintenance Guide

Section 1.0: Quick Start Procedure

1. Ensure equipment is located on level, stable ground.
2. Connect plant electrical cable to generator. Energize all breakers within the plant panel.
3. Set lift station at camp discharge point. Connect hose from lift station to system inlet. Plug in lift pump, heater, and line heat tracing into receptacles at front of plant building.
4. Within control panel set timer to "OFF" 24 hours, "ON" 1 minute.
5. Install Zabel filter within clarifier tank.
6. Insert the UV bulbs into the quartz sleeves, connect the power cable to each bulb, replace the protective covering of the bulb access area (not with all UV systems) and energize the UV lamps.
7. Connect discharge line at back of building. Plug discharge line heat tracing into receptacle at back of plant building.

NOTE: The QUICK START procedure is to be used only if plant has previously been in operation and the operator is familiar with the plant's operation.

Section 2.0: System Start-Up Procedure

1. Ensure the packaged treatment plant is set on level secure ground. Wooden planks may be required to ensure system is level.
2. Unroll main electrical cable and plug into camp supply power. Most Eco Tech Camp Waste Water Treatment packages require a 3 phase 60 or 100 amp service at 208 volts.
3. Within the system's breaker panel, energize the interior heater(s) and lights only. The system will require approximately 2-4 hours to heat the building interior and components prior to influent being produced to plant.
4. Ensure all valves along the tank drain header system are closed.
5. Remove the aluminum lift station and locate such that the camp discharge line(s) gravity flow into the tank top.
6. Connect the heat traced/insulated 2" line to the lift station discharge port. Connect the other end to the Primary tank inlet located within the treatment building. Open the 2" inlet valve.

16. Go back to the sludge pump and lift the level switch to its full upright position. After a 10 second delay the pump will run for 10 seconds. This cycle will be repeated provided the level switch is held in the upright position. Lower the level switch to see if the ON/OFF cycle does not take place. It should not.
17. With that control cycle working reset the "OFF" mode to 24 hours and the "ON" mode to 1 minute. Once the plant is operational these time settings may require adjustment based on sludge volume within the clarifier and overall plant operation. Eco Tech representatives should be consulted prior to adjustments being made.
18. Locate the PVC Zabel filter. It is generally shipped loose with the plant and should be removed from its piping connections each time the system is transported.
19. Thread the 3" x 4" PVC adapter into the 3" overflow port from the clarifier to the discharge chamber. Depending on the specific plant, more than one overflow port may exist and hence more than one Zabel filter is required.
- 19A. If UV disinfection is being employed the 3" coupling will be on the side of the clarifier. Thread the adapter to the coupling extending into the clarifier tank.
20. Slide the 4" PVC adapter into the Zabel filter outlet port. **DO NOT GLUE THE ZABEL FILTER TO THE 4" ADAPTOR.**
21. If not already done so insert the Zabel filter plates into the PVC housing.
22. UV inlet and outlet lines will be pre-plumbed at the factory. The UV bulb(s) must be inserted into the UV system. Remove both PVC end caps from the UV system. The end caps are secured to the body of the UV system using three screws. Remove the bulb(s) from their protective wrapping. Insert the bulb(s) into the quartz sleeve(s) and push on the electrical connections to both ends of the bulb(s). Replace the UV system end caps. Plug the UV into the wall receptacle provided and turn the power selector at the UV to "ON". The UV is now energized. **NOTE:** 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.
23. Open the discharge chamber exit valve. The discharge pump has been installed at the factory.
24. At the main control panel select the "Hand" position for the discharge pump. The pump will energize.
25. Now select the "Auto" position for the discharge pump. Lift the level switch to the upright position. The pump will energize. **NOTE:** In later models of these systems the discharge pump is not interlocked to the control panel and there is no mode

- the discharge pump. Once the discharge chamber is emptied close the discharge valve.
9. Remove the Zable filter element and set aside for transport.
 10. Disconnect and store for transport the treated effluent discharge line(s).
 11. A vacuum truck is required to remove all remaining fluid from the tank system. The primary, biozone and clarifier tanks will require emptying. Connect the vacuum line to the 2" discharge port on the exterior of the building. A 2" male camlock connection has been provided. As there is a solids retaining screen within the primary tank a 2" vacuum line may have to be placed with it to remove its contents.
 12. Open all 2" tank drain valves along the tank header line. This volume (1000 to 5000 gallons depending on plant capacity) of fluid must be removed to a licensed treatment facility.
 13. Leave all drain valves open to prevent them from cracking due to freezing.
 14. If UV disinfection is being employed remove the UV bulb(s) and store for transport. The bulbs are very fragile and must be properly packaged.
 15. The fluid within the UV system must be removed. Open the small drain port on the UV exit line or that is tapped into the UV body. Drain fluid into bucket. As this volume is very small the contents can be poured back into the aeration tank.
 16. Turn all breakers off. Unplug main electrical cord from generator and store on cable wrap.
 17. Place the lift station(s) within the building and secure them for transport.

Section 4.0: Trouble Shooting Guide

Symptom	Causes	Remedies
Lift Station filling, pump not activated.	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.
	3 phase powered pump	Switch 2 of the electrical

Clarifier overflowing to back into biorotor.

Timer cycle setting needs adjustment.

Set timer "OFF" position to Shorter duration. May have to set "ON" position to longer duration. "ON" not to ever be set to more than 1 minute.

Plant is "hydraulically overloaded"

Ensure that water inlet rate is less than 70 gpd per person being serviced by plant.

Zabel filter element plugged.

Remove filter plates and clean with water.

Discharge pump not activating.

Level switch stuck in down position.

Reposition level switch for free movement.

No power to pump.

Check breaker and selector.

High Coliform reading on discharge sample.

Limited UV radiation (on selected units)

Ensure UV bulbs are on. Bulbs may need replacing. Reduce flowrate through UV system by closing valve on UV discharge.

Symptom	Causes	Remedies
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UV bulb not completely submersed in effluent. UV stand needs to be lowered.

Air lock in UV system, remove site plug to allow air lock to escape. Lower UV stand.

UV quartz sleeves require cleaning. See vendor data.

		Ensure cleaning products used are biodegradeable. Reduce volume of chlorine and ammonia based cleaning agents.
		Add sewage plant enzyme.
Grey or Black biomass	Septic conditions in plant.	Increase aeration or ensure there are not blockages in aeration line. Open air line into primary tank for 10 min.
		Ensure cleaning products used are biodegradeable. Reduce volume of chlorine and ammonia based cleaning agents.
		Add sewage plant enzyme.

Section 5.0: Equipment and Flow Description

All treatment equipment is contained within the all weather steel constructed building. Depending on the specific plant and options selected at time of purchase, included is one aluminum constructed lift station with submersible solids handling pump and tank heater, as well as 250 feet of insulated and heat traced transfer line.

Electricity to operate utility lighting, heating and the plants electrical control systems is provided through the 3 phase, 208 volt, 60 amp rated 5 wire conductor cable. The cable is fitted with a 4 pole, 4 wire liquid tight male cord end to be plugged into a main power supply.

Camp sewage is gravity fed into the aluminum lift station. Depending on camp sewage discharge pipe height the lift station may have to be placed below grade. Once the lift tank starts to fill a floating level switch will activate the lift pump. Tank contents are transferred into the system through a heat traced, insulated 2" hose.

Effluent enters the system at the primary tank. This tank provides retention time for suspended matter within the influent to settle out. A solids screen within the tank retains larger solids that may negatively impact the plant from entering the biological active tank segments. Over time these solids will partially digest when mixed with active sludge returned from the clarifier tank and pass through the solids screen. Depending on influent flow patterns the primary tank may turn septic initiating the sewage digestion process

The discharge chamber is equipped with a submersible discharge pump activated on tank level. Discharge fluid is pumped out of the building to the disposal area via heat traced and insulated 2" discharge hose.

The building is heated for year round operation with one 5 kW three phase electric heater. Exterior lines are heat traced. All heat tracing receptacles are locally mounted for convenience. The system's electrical system also accommodates two additional convenience receptacles.

Section 6.0: Routine and Periodic Maintenance

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. These pumps are capable of running dry for short periods of time without damage to the components. 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.

Bioshaft Main Bearings – grease monthly to keep water out of bearing. Recommend use of Keystone 80-XLT grease. Annually remove bearing cover, clean, check rollers and repack.

Drive Gear Box – check oil level and for discoloration monthly. Change oil annually. See manufactures information for oil selection chart.

Air Blower – clean inlet filters monthly. Replace as required.

Zabel Filter – Pull and inspect filter for damage and plugging weekly. Filter element should be cleaned every 2 to 4 weeks. Cleaning too frequently will reduce its effectiveness to filter small entrained particles.

Biorotor – biomass will build on rotor over time. Annually, the rotor should be sprayed off. Alternatively the rotor should be cleaned if the plant is to be shut down for an extended period of time (greater than 4 weeks). Rotor media should be inspected monthly for broken or plugged segments. Remove and replace damaged segments. This can be done with rotor in place on biozone tank.

Precautionary Note:

The Rotating Biological Contactor 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.

Shell Farewell – License N7L1-1762



Proposed
RBC Wastewater Plant Modifications

Mod. 2001-1

1. Equipment Modifications

The rotating biological contactor wastewater treatment plant supplied to Western Geco by Eco Tech never produced treated effluent quality required for its discharge into the environment. Our interpretation of the results, suggested the principle reason was due to hydraulic and organic overloading of the plant, particularly during peak influent flow events.

In order to minimize the impacts the peak flow or surge events have on the plant, Eco Tech proposes to implement the following modifications to the equipment:

- Provide a primary/trash tank with a minimum volume of 4000 gallons;
- Provide an aerated surge tank with a minimum volume of 4000 gallons;
- Improve the capacity for suspended solid removal within the treated effluent with the addition of a second Zabel filter to the secondary clarifier;
- Increase the UV dosage to improve the disinfection capability of the clarified effluent.

Primary/Trash tank – 4000 Gallons

The primary trash tank would be installed between the camp lift station(s) and the equalization tank. The tank size is based on that recommended by Komex within their evaluation report. This tank would provide for reducing organic and inorganic loading of the treatment plant by allowing the heavier constituents to settle out of suspension within the tank. Floatable oil and grease particles would also be retained within the tank by the use of an underflow weir interconnecting the two tank compartments.

Digested sludge from the secondary clarifier would be returned to the primary tank for reprocessing and accumulation. Periodic removal of the accumulated matter within the tank would be necessary.

Equalization tank – 4000 Gallons

The proposed flow equalization tank with a holding capacity of 4000 gallons will serve to minimize the impacts surge events have on plant performance. Within the camp facilities last year, observed surge events were encountered two to three times per day lasting from one to three hours in duration per event. The surge events observed accounted for an estimated $\frac{1}{2}$ to $\frac{2}{3}$ of the camp's daily wastewater outfall volume. Periodically, such as crew change or those in which the camp laundry facilities were operating at capacity, the duration and frequency of the surge events was prolonged.

The equalization tank will allow for retention of the surge event volumes while dosing a preset volume into the RBC's bucket feed section over a prolonged time frame. In this way, the potential for hydraulic overloading of the plant is significantly reduced. Eco Tech would install a sewage solids pump within the equalization tank to dose into the bucket feed tank of the RBC.

Control of the dosage would be accommodated in two ways: a level switch within the bucket feed tank would control the pump operation, as well the pump would be plumbed so that the output volume would be split between the bucket feed tank and recirculated through the equalization tank.

A gate valve on the pump discharge line leading into the RBC bucket feed tank will allow for manual regulation of the dosing rate. The remainder would be diverted back into the equalization tank for continued mixing of the fluid.

A regenerative blower would continuously supply oxygen to precondition the fluid prior to delivery into the bucket feed chamber. Complete mixing of the preconditioned fluid with that input from the primary tank, is accomplished by recirculation of the fluid using the dosing pump. It is then more probable that the entire volume of the tank is exposed to per-aeration prior to exiting.

Shell Canada Limited



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

CAMP FAREWELL QA/QC PLAN

SEE PLAN PREVIOUSLY SUBMITTED

Shell Canada Limited



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

CAMP FAREWELL CONTINGENCY PLAN
DECEMBER, 2000

SEE PLAN PREVIOUSLY SUBMITTED



Rec'd 12/11/2000
All.

WATER REGISTER: N7L1-1762

November 30, 2000

Mr. Randy H. Hetman
Construction Manager
SHELL CANADA
400-4th Ave. S.W.
PO Box 100, Station M
CALGARY, ALBERTA T2P 2H5

Dear Mr. Hetman

ISSUANCE OF A "B" TYPE LICENCE

Attached is a duplicate of Licence No. N7L1-1762 granted to SHELL CANADA. 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 is anticipated.

Sincerely,

Gordon Wray
Chairman
N.W.T. Water Board

Attachments (2)

**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.
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.

The Surveillance Network Program annexed to the Licence can be modified at the discretion of the Board and does not require a public hearing. A request for any proposed change to the Surveillance Network Program should be forwarded to the Board in writing, including a rationale for the change.

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 1500
YELLOWKNIFE, NT X1A 2R3

Phone No: (867) 669-2772

Fax No: (867) 669-2719

ANALYST: Analyst
Water Laboratory
Northern Affairs Program
Department of Indian Affairs
and Northern Development
Box 1500
4601 - 52nd Avenue
YELLOWKNIFE, NT X1A 2R3

Phone No: (867) 669-2780

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INSPECTOR: Inspector
Inuvik District Office
Northern Affairs Program
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

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
(Licensee)
400-4th Avenue S.W.
PO BOX 100, STATION M
of Calgary, Alberta T2P 2H5
(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	<u>N7L1-1762</u>
Licence Type	<u>"B"</u>
Water Management Area	<u>NORTHWEST TERRITORIES 07</u>
Location	<u>LATITUDE 69°12'30" N. AND</u> <u>LONGITUDE 135°06'04" W.</u> <u>NORTHWEST TERRITORIES</u>
Purpose	<u>WATER USE AND WASTE DISPOSAL</u> <u>FOR MUNICIPAL UNDERTAKINGS</u>
Quantity of Water Not To Be Exceeded	<u>150 CUBIC METRES DAILY</u>
Effective Date of Licence	<u>DECEMBER 1, 2000</u>
Expiry Date of Licence	<u>NOVEMBER 30, 2005</u>

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 to use water and dispose of waste for municipal undertakings in oil and gas exploration and associated uses at Camp Farewell in the MacKenzie River Delta, located at Latitude 69°12'30" N. and Longitude 135°06'04" W., 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*;

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

"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 moving average of any four (4) consecutive analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the "Surveillance Network Program";

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

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

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

"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 31 of the year following the calendar year reported which shall contain the following:
 - a) the total quantities 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 results of sampling carried out under the Surveillance Network Program;
 - d) a summary of any modifications carried out on the Water Supply and Waste Disposal Facilities, including all associated structures;
 - e) a list of any spills and unauthorised discharges; and
 - f) 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. 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.
5. The Licensee shall, within thirty (30) days of the issuance of this 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.
6. Prior to the use of water for municipal undertakings or the disposal of waste and 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 Hundred Fifty Thousand dollars (\$250,000.00) in a form suitable to the Minister.
7. 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 the Mackenzie River or the unnamed lake as described in the project description or as otherwise approved by an Inspector.
2. The daily quantity of water used for all purposes shall not exceed 150 cubic metres.
3. 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.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall within one (1) year of the issuance of this Licence, submit to the Board for approval an Operation and Management 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. The Licensee shall direct all piped and pumpout sewage to the Sewage Treatment Facilities or as otherwise approved by the Board.
3. The Licensee shall provide at least five (5) days notice to an Inspector prior to commencement of any discharges to the Mackenzie River.
4. 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:

<u>Sample Parameter</u>	<u>Maximum Average Concentration</u>
BOD ₅	30.0 mg/L
Total Suspended Solids	35.0 mg/L
Faecal Coliforms	250 CFU/dL
Oil and Grease	5.0 mg/L

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

5. The Licensee shall maintain the Sewage Treatment Facilities to the satisfaction of and Inspector.
6. The Licensee shall dispose of all solid wastes in a manner acceptable to the Inspector.

PART E: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written approval from the Board, carry out modifications to the Water Intake and Waste Treatment Facilities provided that such modifications are consistent with the terms of this Licence and the following requirements are met:
 - a) the Licensee has notified the Board in writing of such proposed modifications at least forty-five (45) days prior to beginning the modifications;
 - b) such modifications do not place the Licensee in contravention of either the Licence or the Act;
 - c) the Board has not, during the forty-five (45) days following notification of the proposed modifications, informed the Licensee that review of the proposal will require more than forty-five (45) days; and
 - d) the Board 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 the Board.
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 issuance of this Licence, a Contingency Plan in accordance with the Board's "Guidelines for Contingency Planning, January 1987," or subsequent edition.
2. If, during the period of this Licence, an unauthorised discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a) employ the appropriate contingency plan;

- b) report the incident immediately via the 24 Hour Spill Report Line. The current telephone number is (867) 920-8130; and
- c) 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 year of issuance of this Licence, an Interim Abandonment and Restoration Plan in accordance with the Board's "Guidelines for Mines in the Northwest Territories," September 1980, or subsequent edition.
- 2. The Licensee shall implement the Plan specified in Part G, Item 1 as and when approved by the Board.
- 3. The Licensee shall review the Abandonment and Restoration Plan every two years and shall modify the Plan as necessary to reflect changes in operations, technology. All proposed modifications to the Plan(s) shall be submitted to the Board for approval.

NORTHWEST TERRITORIES WATER BOARD

Witness



Chairman

NORTHWEST TERRITORIES WATER BOARD

LICENSEE: SHELL CANADA
LICENCE NUMBER: N7L1-1762
EFFECTIVE DATE OF LICENCE: DECEMBER 1, 2000
EFFECTIVE DATE OF
SURVEILLANCE NETWORK PROGRAM: DECEMBER 1, 2000

SURVEILLANCE NETWORK PROGRAM

A. Location of Sampling Stations

<u>Station Number</u>	<u>Description</u>
1762-1	Treated Effluent Discharge Prior to Entering the Mackenzie River

B. Sampling and Analysis Requirements

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

BOD ₅	Total Suspended Solids
Oil and Grease	Faecal Cloiforms
Ammonia	

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 analysis shall be performed in a laboratory approved by an Analyst.
5. The Licensee shall, by January 31, 2001, 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