



Contaminants and Remediation Directorate  
 PO Box 1500,  
 Yellowknife NT X1A 2R3

July 11, 2008

Your file    Votre référence

**Northwest Territories Water Board**  
 5114- 49<sup>th</sup> St CJCD Building  
 PO Box 1326  
 Yellowknife, NT  
 X1A 2N9

Our file    Notre référence

COPY	
BOARD	4
CHAIR	—
E.A.	—
W. RES	OKG.
NMDO	1
FILE	1824

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Dear Sir/Madam:

**Subject: Water Licence N7L1-1824 Submittals - Johnson Point Remediation Project**

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Further to the electronic submission of submittals today, please find attached hard copies of the following submittals associated with the Johnson Point Water Licence N7L1-1824 held by the Contaminants and Remediation Directorate (CARD) of INAC:

- Quality Assurance/Quality Control Plan (QA/QC Plan) as per SNP Part B Item 7. Note that this plan has already been submitted to the analyst for approval.
- Spill Contingency Plan as per Part F Item 1
- Further details on the greywater treatment system from the remediation contractor E. Gruben's Transport

If there are any questions or concerns regarding this supplementary information, please contact me at (867)669-2756 or [pikee@inac-ainc.gc.ca](mailto:pikee@inac-ainc.gc.ca) or Joel Gowman at (867) 669-2423.

Sincerely,

Emma Pike  
 Project Manager



## **E. Gruben's Transport Ltd.**

### **Extended Aeration Grey-Water Treatment System**

#### **OBJECTIVE:**

To treat all grey-water generated from camp operations to meet the following effluent disposal parameters as outlined in the NWT Water Board type "B" water license # N7L1-1824 for Johnson Point Remediation Project.

- Mineral Oil & Grease – Maximum Concentration 5 mg/L and none visible
- Total Suspended Solids – Maximum Concentration 100 mg/L
- Residual Chlorine – Maximum Concentration 0.1 mg/L

#### **CAMP INFORMATION:**

- The camp facility will not generate "Black- Water" as the camp has been outfitted with "Patco Waterless Toilets" and all toilet waste will be incinerated.
- The Kitchen plumbing system will have a grease trap clean-out system.
- The camp will use chlorine free, environmentally friendly cleaning products through the duration of the project.
- The on-site camp can accommodate 34 people; average camp occupancy is expected to be 22-26 people. It is expected that 1500 to 2000 liters of grey-water per day will be generated. The camp will be operational for approximately 45 days in the summer of 2008 and approximately 75 days in the summer of 2009.

#### **PROCESS:**

Kitchen water will filter through a grease trap to contain the mineral oil and grease. This unit will have a clean-out thus allowing for trapped grease and oil to be cleaned out and incinerated. Water will be transferred out of the camp into an 18,000 liter lined sump. The lined sump will serve as a batch holding and initial settling area for the "Grey-Water". The Grey-water will remain in the 18,000 liter lined sump for up to 48 to 72 hours and then be transferred into an 18,000 liter aeration tank housed inside the treatment plant. The grey-water will be aerated for approximately 24 to 36 hours. After the aeration process the grey-water will be fed continuously into a 4,000 liter final settling tank, through a UV light and into a 42,485 liter lined sump. The system will consist of two 42,485 liter lined sumps, this will allow for alternate sumps to be used while waiting for analytical results of previous batches. EGT will have sufficient liner material on site to construct an additional two 42,485 liter sumps if required. Should the system not meet discharge criteria, the lined sumps can be covered with additional liner material in such a

manner that will manage precipitation for over winter storage and ensure the sumps do not overflow and allow for the inadvertent release of the contained effluent into the environment.

#### **TESTING:**

Testing of grey water will be conducted by "Maxxam Analytics Inc" at 9619 42<sup>nd</sup> Ave. Edmonton Alberta (780-465-1212). Samples will be sent bi-weekly as volumes dictate. Maxxam Analytics will test for total suspended solids, Mineral Oil and Grease and residual chlorine content as per the Water License.

#### **LOCATION OF TREATMENT SYSTEM & SUMPS:**

The treatment system and sumps will be located 100 meters to the southeast of the camp location on potential borrow area 8. Grey-water will be transferred with a pump and hoses from the rear of the camp into an 18,000 liter lined sump.

#### **PROPOSED DISCHARGE LOCATION:**

EGT proposes to discharge the treated approved for discharge grey-water on the west side of the access road in a location where dumping was permitted on past programs by the water board.

#### **DETAILS of SUMP LINER:**

The various sumps associated with the grey-water treatment system will be dug out with a dozer and an excavator to a depth of 30 centimeters. The material from the excavated sump will be used to form retaining berms on the outside of the sump to achieve 60 centimeter walls with the intent of having 30 centimeter liquid depth within the sump. The model EGT will be using is Enviro-Liner 4030, details of liner specifications are below as well a drawing of the berm can be seen following the liner description.

## **Enviro Liner® 4000 series of geomembranes**

The Enviro Liner® 4000 series is a specialized polyethylene lining material that combines flexibility, UV stability, and chemical resistance. The Enviro Liner® 4000 series was originally designed as a flexible cap material for landfills. Its good flexibility allows it to accommodate differential settlement in landfill cap applications. This flexibility also allows it to be prefabricated (welded, folded and rolled) so that many jobs can be lined using a one-piece liner.

The Enviro Liner® 4000 series is manufactured by Layfield. Each step in the production of your liner panel, from the geomembrane production, to fabrication into a custom panel, is governed and directed by EPI's quality control system. The resulting process is professionally designed to ensure your geomembrane meets specified properties, and performs to the highest possible standards in the field.

The Enviro Liner® 4000 series is ideally suited to small, exposed ponds, or for liquid or effluent containment. The Enviro Liner® 4000 series is excellent for use in backfilled water ponds, run-off collection ponds, channels, and other water and waste water containment applications. The Enviro Liner® 4000 series is UV stabilized with the addition of carbon black and is suitable for exposed use in a number of applications.

Enviro Liner® 4000 Minimum Properties				
Style	ASTM	Enviro Liner® 4020	Enviro Liner® 4030	Enviro Liner® 4040
Thickness (Minimum Average)	D5199	20 mil 0.5 mm	30 mil 0.75 mm	40 mil 1.0 mm
Thickness (Lowest Individual)	D5199	-10%	-10%	-10%
Density (Max)	D792	0.939	0.939	0.939
Tensile Strength at Break	D638 Type IV	76 ppi 13.3 N/mm	114 ppi 20.0 N/mm	152 ppi 26.6 N/mm
Elongation	D638	800%	800%	800%
Tear Resistance	D1004	11 lbs 49 N	16 lbs 71 N	22 lbs 98 N
Puncture Resistance	D4833	32 lbs 142 N	48 lbs 213 N	61 lbs 271 N
Carbon Black Content	D1603	2.0-3.0%	2.0-3.0%	2.0-3.0%
Low Temperature Impact Resistance	D746	-69°F -56°C	-69°F -56°C	-69°F -56°C

Enviro Liner® 4000 Minimum Shop Seam Strengths				
Style	ASTM	Enviro Liner® 4020	Enviro Liner® 4030	Enviro Liner® 4040
Heat Bonded Seam Strength	D6392 25.4 mm (1") Strip	35 ppi 6.1 N/mm	48 ppi 8.4 N/mm	68 ppi 11.9 N/mm
Heat Bonded Peel Adhesion Strength	D6392 25.4 mm (1")	FTB 28 ppi 4.9 N/mm	FTB 43 ppi 7.4 N/mm	FTB 58 ppi 10.2 N/mm

Strip				
Enviro Liner® 4000 Minimum Field Seam Strengths				
Style	ASTM	Enviro Liner® 4020	Enviro Liner® 4030	Enviro Liner® 4040
Heat Bonded Seam Strength	D6392 25.4 mm (1") Strip	28 ppi 4.9 N/mm	43 ppi 7.5 N/mm	58 ppi 10.2 N/mm
Heat Bonded Peel Adhesion Strength	D6392 25.4 mm (1") Strip	FTB 24 ppi 4.2 N/mm	FTB 38 ppi 6.7 N/mm	FTB 51 ppi 8.9 N/mm

Each and every liner panel we produce is a custom panel. The way we set up our shop is unique in that our shop welders produce prefabricated panels to best match your containment area. We size each panel to fit, without waste, in a logical sequence in your containment area. In containments with irregular shapes we size our panels to best accommodate the irregular size.

There are no theoretical limits to the size of the liner panels that we can prefabricate but there are some practical limits, notably panel weight. Panel weight is important because of the limits of handling equipment that will be available in the field. EnviroLiner is normally limited to a maximum panel weight of 2,500 lbs (1,200 kg); however, if a skilled installation crew is available then a panel of up to 4,000 lbs (1,800 kg) is possible.

Panels are accordion folded in one direction and then rolled in the other direction. Unfolding instructions and dimensions are marked on the individual liner panel. Each panel is wrapped in an opaque, weather resistant covering suitable for shipment and storage.

All shop fabricated seams are 100% visually inspected by the welding operator. Every panel is tested for Film Tear Bond and destructively tested in peel and shear. Quality control reports are available with each panel produced.

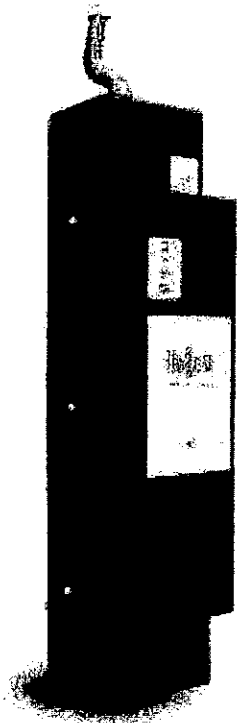
#### DETAILS OF UV TREATMENT SYSTEM

The System will incorporate a "Hallett 30" UV Wastewater Treatment System from UV Pure Technologies details of system as follows:

# Hallett<sup>30</sup>

Community & Commercial Ultraviolet Water Purification Systems

Hallett™ UV systems are the world's only NSF/ANSI 55 Class A Certified UV water purification systems with patented Crossfire Technology.™ UV Pure's Hallett™ 30 for community and commercial applications, outperforms conventional systems for disinfection of all pathogens including viruses, bacteria, cryptosporidium, giardia, legionella and E. coli



#### CROSSFIRE TECHNOLOGY IS THE MOST EFFECTIVE UV TREATMENT

- NSF/ANSI 55 CLASS A CERTIFIED TO 30 US gpm, 113 L/min, 6.7 m<sup>3</sup>/hr
- Highest UV Dose – proprietary high-output long-life lamps
- UV dose rate at max flow is 40 mJ/cm<sup>2</sup> at end of lamp life
- Elliptical reflectors target and deactivate pathogens from 360°
- Lamps air-cooled – operate at most effective UV output at all times

#### CROSSFIRE TECHNOLOGY IS ENGINEERED TO BE RISK FREE AND FAIL-SAFE

- Dual smart UV sensors monitor both UV output and water quality
- Built-in microprocessor monitoring with both visual & audible alarm notification
- Automatic shut-off fail-safe solenoid valve – if the water is running, the water is safe

#### CROSSFIRE TECHNOLOGY IS SELF-CLEANING

- Automatic mechanical quartz cleaning system – quartz does not foul
- No quartz cleaning or system drainage required, so no risk of quartz breakage
- Water softening is not required, saving money and the environment

#### CROSSFIRE TECHNOLOGY IS VIRTUALLY MAINTENANCE FREE

- Lamps mounted in air – easy to replace, no system draining required

#### CROSSFIRE TECHNOLOGY IS SIMPLE TO INSTALL

- Flexible stainless FIP connections for quick and simple installation
- Compact size

For more information, visit [www.pureh2o.com](http://www.pureh2o.com)

Pure, safe water.



*Always.*



NSF/ANSI 55 CLASS A CERTIFIED

ULTRAVIOLET WATER PURIFICATION SYSTEMS

Hallett systems with patented Crossfire Technology provide microbiological purification of drinking water. With a Hallett system properly installed, full-time engineering ensures that no potentially dangerous microorganisms can enter your drinking water distribution system. UV Pure does not recommend the use of other filtration systems to treat chemical and other non-microbiological contaminants. To find out everything visit [www.pureh2o.com](http://www.pureh2o.com)

# Hallett™ 30 with Crossfire Technology™ Specifications

Certification	NSF/ANSI 55 Class A Certified
Flow Capacity	30 US gpm, 113 L/min, 6.7 m <sup>3</sup> /hr
Multiple System Flow Capacity	Run in parallel - up to 600 US gpm
UV Dose	40 mJ/cm <sup>2</sup> at end of lamp life
Built-in microprocessor	Dual smart sensors monitor UV output and water quality
Alarms	Visual & audible notification of: 1. System is working & water is safe 2. Lamp output alarm 3) Water quality alarm
Monitoring	Continuous UV transmittance feedback
Solenoid Valve	Auto shut-off fail-safe valve so only safe water can enter your water distribution system
Self-Cleaning	Stainless steel wiper prevents quartz fouling
Maintenance	Automatic alarm reminder - 2 lamps - replacement required every 12 months, a simple 2 minute process
Redundancy	Additional back-up systems can be installed cost effectively
Inlet & Outlet Connections	Flexible FIP Connections - 1" inlet and 1" outlet
Pre-filtration	5 micron sediment filter recommended and/or carbon filter for taste and odour
Maximum Pressure	100 PSI, 690 kPa (tested to 240 PSI)
Pressure Drop	20 PSI @ 22 gpm (138 kPa @ 83L/min)
Voltage	120/220 VAC - 140W
Electronic ballast	Auto power regulated, protected from power fluctuations
Dry Contacts	Available for remote monitoring or auto dialers
Electrical	Entela (UL & CSA equivalent)
Dimensions	32" H x 8" W x 9" D (81cm H x 20 cm W x 23 cm D)
Warranty	3 years on all electrical components, 5 years on housing

## Hallett™ System Pre-treatment Conditions

WITH CROSSFIRE TECHNOLOGY™ - NO WATER SOFTENER REQUIRED

	Water Conditions		Effective Treatment Range	
	MIN	MAX	MIN	MAX
Hardness	0	50 Grain (855 mg/L)		
Iron	0	3 mg/L (ppm)		
Manganese	0	0.5 mg/L		
% UV Transmittance	75%	100%		
pH	6.00	9.00		
Total Dissolved Solids (TDS)	0	1000 mg/L		
Water Temperature	1° C (34° F)	38° C (100° F)		
Air Temperature	7° C (45° F)	38° C (100° F)		
Turbidity	0 NTU	1 NTU		
Water Pressure	10 PSI (69 kPa)	100 PSI (690 kPa)		

## Microbiological Drinking Water Purification Scorecard

THE HALLETT™ SYSTEM WITH CROSSFIRE TECHNOLOGY™ SCORES 10/10

	HALLETT SYSTEM	CONVENTIONAL UV	OZONE	REVERSE OSMOSIS	CHLORINATOR	SAND FILTER
Real time indicator of water quality	✓	-	-	-	-	-
NSF certified	✓	selected units	-	-	-	-
Works in high TDS	✓	-	✓	✓	✓	✓
No softener required	✓	-	✓	✓	✓	✓
Self cleaning/low maintenance	✓	-	-	-	-	✓
Not hazardous to your health	✓	✓	-	✓	-	✓
Economical	✓	✓	-	-	-	-
Effective removal of all pathogens	✓	✓	-	-	-	-
Fail safe shut-off	✓	selected units	-	-	-	-
Doesn't put contaminants back in the environment	✓	✓	✓	-	-	-
<b>SCORE</b>	<b>10/10</b>	<b>5/10</b>	<b>3/10</b>	<b>3/10</b>	<b>2/10</b>	<b>4/10</b>

Model #: Crossfire Rev: 10/2013



UV PURE TECHNOLOGIES INC.

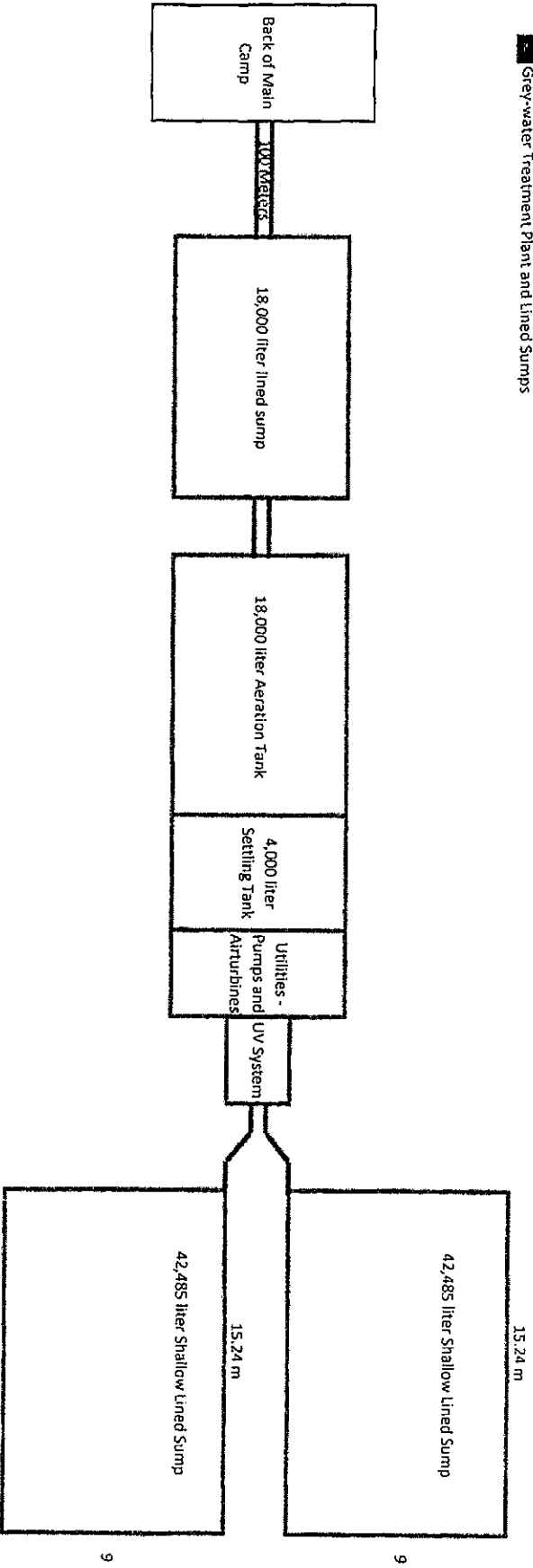
T 416.208.9884 F 1.888.407.9997 F 416.208.5808 E safe@uvpure.com 60 Venture Drive, Unit 19, Toronto, Canada M1B 3S4

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Lined Sumps and Treatment Plant Layout for Grey Water Settling, Treatment and Storage

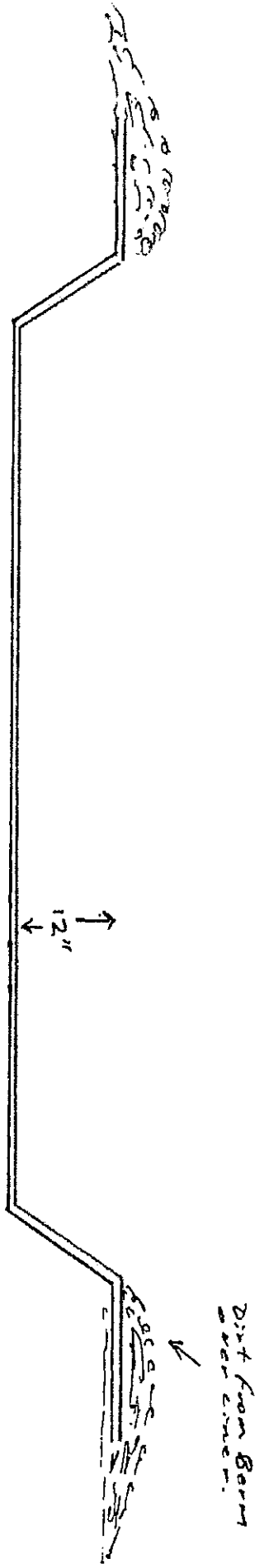
Fluid Transfer Lines

Grey-water Treatment Plant and Lined Sumps





Typical Lined Berm Construction



■ Enviro Liner 4030