

**Hamlet of Fort Liard**

**March 31, 2012**

**Water License MV2009L3-0025**

**Annual Water License Report 2011**

**Period: January 1<sup>st</sup> through December 31<sup>st</sup>, 2011**

The Licensee ensures compliance to terms, conditions and Regulations of the Water License issued March 1, 2010. Consistency and quality control of the Water Supply Facility and Sewage and Solid Waste Disposal Facilities remains in good practice and are maintained on a daily basis. Alan Harris; Manager Municipal Operations, certified Class 1 Water Treatment Plant Operator trained in Small Systems Waste Water Treatment and Solid Waste Management, along with ongoing assistance of municipal staff ensures compliance of the granted License. The Water Plant is operated daily by Certified Class 1 Water Treatment Plant Operator, Robert Firth, with assistance in daily operations provided by Alan Harris. Needed Water Plant and Disposal Site facility maintenance duties are performed by Bernie Bonnetrouge, Supervisor of Facility Operations and Maintenance along with Hamlet grounds and facility maintenance personnel.

The scheduled Water Plant upgrade work was completed in May of 2011. New equipment installed during upgrade work include: Greensand Filtration System, Ultraviolet Disinfection, Automatic Transfer Switching, Smart Vend Control System, Well Pumps, Truckfill Pumps, Flow meters, Plant water line piping, Fire Alarm System, Envirotank Fuel Oil System with day tank, exterior Fuel Storage tank and all related piping. Changes were also made on plant Domestic Water supply, water heating system and Plant Control Circuitry along with Compressor Operations. New well water In-flow and Truck-fill meters were brought on-line during May and June of 2011. All regular ongoing yearly plant maintenance work was completed as required. Regular bacteriological water tests are completed monthly with test results submitted to the Environmental Health Officer at the end of each month. Water delivery trucks were cleaned and disinfected once during this report period. Water plant Chemical and Physical parameter test results were taken and results submitted in April 2011 (copy of test results attached).

The solid waste site operated with no difficulties and continued with the ongoing sorting, compacting and covering of waste material. Work on the new solid waste facility was completed and opened, following the erection of site fencing and signage, in October of 2011. Municipal waste and Bulk waste is being sorted into designated and identified areas including Household Hazardous waste, bulk waste, including tires, appliances and re-usable materials. Work continues on the sorting, separating and moving of bulk waste materials from the old waste site in preparation of final site clean-up and reclamation.

Sewage Lagoon effluent tests were taken in June (copy of test results attached), and a lagoon decant was performed in July 2011. Cell to cell transfers were performed in April and in July following the completion of approved decant. Cell transfers were performed twice more in August and November. Following submittal of test results, a scheduled decant was performed during September on water that had collected in old lagoon 1dyke area, removed from service in 2007. No modifications or changes were made to the sewage lagoon facility during the year of 2011. Maintenance consisted of ongoing stabilization of the dyke structures, general lagoon and dyke edge clean-up and access road grading.

Mackenzie Valley Land  
and Water Board

Title \_\_\_\_\_

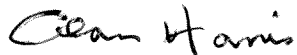
07 2012

Application # \_\_\_\_\_ 1 \_\_\_\_\_

Copied To \_\_\_\_\_

Attachments:

- Monthly Water Consumption Volume 2011
  - Municipal Water Volume 2011
  - Plant operations Volume 2011
- Sewage Disposal Tracking and Volumes 2011
- Alpha Laboratory Technical Report (April 19, 2011)
- Alpha Laboratory Technical Report (July 13, 2011)



Alan Harris  
Manager Municipal Operations  
Hamlet of Fort Liard



John McKee  
Chief Administration Officer  
Hamlet of Fort Liard

Copy of this report to:

Ed Hornby, South Mackenzie District, DIAND, Yellowknife  
Darnell McCurdy, South Mackenzie District Manager, INAC, Yellowknife

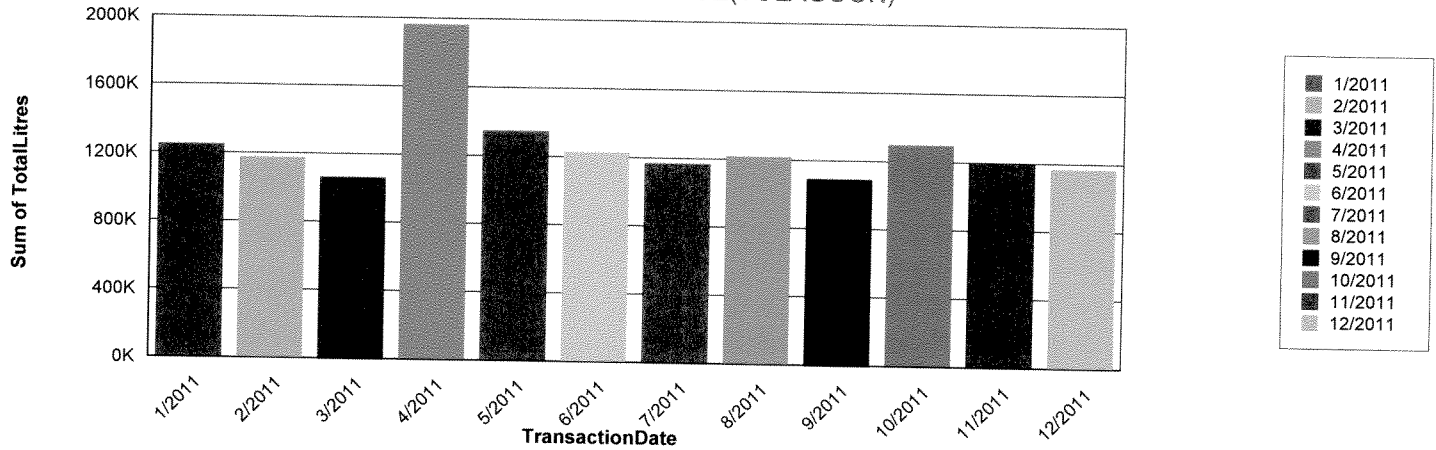


Date Range From:Jan-01-2011 To: Dec-31-2011

## --SEWAGE(TOLAGOON)

### Sum of TotalLitres / TransactionDate

For --SEWAGE(TOLAGOON)



	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11
SEWAGE	1,250,450	1,174,800	1,063,550	1,962,450	1,348,350	1,232,650
<b>Total</b>	<b>1,250,450</b>	<b>1,174,800</b>	<b>1,063,550</b>	<b>1,962,450</b>	<b>1,348,350</b>	<b>1,232,650</b>

	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Total
	1,170,350	1,219,300	1,094,700	1,299,400	1,201,500	1,170,350	<b>15,187,850</b>
	<b>1,170,350</b>	<b>1,219,300</b>	<b>1,094,700</b>	<b>1,299,400</b>	<b>1,201,500</b>	<b>1,170,350</b>	<b>15,187,850</b>

## Sewage Lagoon tracking 2011

- April 13/11 – 9:30 AM started cell transfer Cell #2 to Cell #3
- April 15/11 – 4:30 PM completed transfer Cell #2 to Cell #3
- April 18/11 – 1:00 PM Started cell transfer Cell #1 to Cell #2
  - Not much snow/melt water left around lagoons, dyke freeboard may be OK for Spring
- April 20/11 – 4:00 PM completed transfer Cell #1 to Cell #2
- June 14/11 - submitted lagoon #3 test samples to Alpha Labs for testing
- June 20/11 - Faxed Decant request/notice to MVLWB, DIAND
- June 28/11 – re-submitted lagoon #3 test samples to Alpha Labs for testing, original samples lost by Rainbow
- July 11 /11 - Faxed/mailed test results to MVLWB, INAC
- July 12/11 – Started decant from cell #3 (9:30 AM)
- July 13/11 – Lagoon level cell #3 dropped approx 30 cm – 24 hours      Temperature day 30, night 15 RH 65%
- July 18/11 – Finished decant cell #3 (9:30 AM) – estimated total volume of decant 17,000,000 litres
- July 18/11 – Started cell transfer #2 - #3 (10:30 AM)
- July 20/11 – Stopped cell transfer #2 - #3, cell #1 close to overflow, started cell transfer #1 - #2 (10:00 AM)
- July 22/11 – Stopped cell transfer #1 - #2 (4:30 PM)
- July 26/11 – Restart cell transfer #2 - #3 (10:00 AM)
- July 29/11 – Finished cell transfer #2 - #3 (4:30 PM)
- August 02/11 – Started cell transfer #1 - #2 (10:30 AM)
- August 04/11 – Finished cell #1 - #2 transfer (7:30 AM)
- Sept. 21/11 – Start decant old cell #1 (out of service lagoon) (11:45 AM)
- Sept. 24&25/11 – Decant stopped for weekend
- Sept. 26/11 – Decant of old cell #1 restarted (11:00 AM)
- Sept. 28/11 – Old cell #1 decant complete
- Nov. 01/11 – Started cell transfer #2 - #3 (11:30 AM)
- Nov. 4/11 – finished cell transfer 8:00 AM
- Nov. 8/11 – started cell transfer #1 - #2 10:30 AM
- Nov 10/11 – finished lagoon #1 transfer this PM (4:30 PM)

**ALPHA LABORATORY SERVICES LTD.**

**Analytical and Consulting Services**

17225 - 109 Avenue  
 Edmonton, Alberta T5S 1H7  
 Phone: (780) 489-9100 Fax: (780) 489-9700

**TECHNICAL REPORT**

To: **Hamlet of Fort Liard  
 General Delivery  
 Fort Liard NT X0G 0A0**

File: **34015**  
 Date: **April 19, 2011**  
 Client PO: **1779**  
 Attention: **Alan Harris**

Project: **Annual Water Plant Tests**

Parameter	Unit	Raw Water 1515 Hrs. Mar. 8/11	Reservoir #1 1515 Hrs. Mar. 8/11	Date Analyzed	Analyst Initials
✓ Sodium	mg/L	16	140	Mar. 22/11	T.B.
Sulphate	mg/L	38	37	Mar. 11/11	S.F.
Chloride	mg/L	10	27	Mar. 11/11	S.F.
Fluoride	mg/L	0.14	0.15	Mar. 11/11	S.F.
✓ Nitrate	mg/L N	<0.05	<0.05	Mar. 11/11	S.F.
✓ pH @ 25°C		8.12	8.12	Mar. 15/11	T.H.
Conductivity @ 25°C	µmhos/cm	691	696	Mar. 15/11	T.H.
Total Alkalinity (as CaCO <sub>3</sub> pH 4.3)	mg/L	316	319	Mar. 16/11	T.B.
✓ Total Hardness (as CaCO <sub>3</sub> )	mg/L	324	81	Mar. 22/11	T.B.
Total Dissolved Solids	mg/L	450	510	Mar. 14/11	S.F.
Total Suspended Solids	mg/L	9	<2	Mar. 14/11	S.F.
✓ Colour	TCU	25	10	Mar. 15/11	T.H.
Turbidity	NTU	9.6	0.79	Mar. 15/11	T.H.
Extractable Aluminum	mg/L	<0.010	<0.010	Mar. 22/11	T.B.
✓ Extractable Arsenic	mg/L	<0.0005	<0.0005	Apr. 14/11	T.B.
Extractable Barium	mg/L	0.639	0.158	Mar. 22/11	T.B.
Extractable Cadmium	mg/L	<0.002	<0.002	Mar. 22/11	T.B.
Extractable Chromium	mg/L	<0.002	<0.002	Mar. 22/11	T.B.
Extractable Copper	mg/L	<0.002	<0.002	Mar. 22/11	T.B.
✓ Extractable Iron	mg/L	1.29	0.996	Mar. 22/11	T.B.
Extractable Lead	mg/L	<0.0001	<0.0001	Mar. 20/11	E.X.
✓ Extractable Manganese	mg/L	0.154	0.064	Mar. 22/11	T.B.
Extractable Mercury	mg/L	<0.0005	<0.0005	Apr. 5/11	T.B.
Extractable Selenium	mg/L	<0.0005	<0.0005	Mar. 18/11	T.B.
Extractable Uranium	mg/L	<0.100	<0.100	Mar. 22/11	T.B.
Extractable Zinc	mg/L	<0.001	0.020	Mar. 22/11	T.B.
Cyanide	mg/L	<0.01	<0.01	Mar. 18/11	E.W.
✓ Total Organic Carbon	mg/L	6	5	Mar. 15/11	T.B.
✓ Dissolved Organic Carbon	mg/L	5	5	Mar. 15/11	T.B.
<b>Trihalomethanes</b>					
Chloroform	µg/L	<0.5	40.7	Mar. 22/11	A.L.
Bromodichloromethane	µg/L	<1	12	Mar. 22/11	A.L.
Dibromochloromethane	µg/L	<1	3	Mar. 22/11	A.L.
Bromoform	µg/L	<1	<1	Mar. 22/11	A.L.

# ALPHA LABORATORY SERVICES LTD.

## Analytical and Consulting Services

17225 - 109 Avenue  
 Edmonton, Alberta T5S 1H7  
 Phone: (780) 489-9100 Fax: (780) 489-9700

# TECHNICAL REPORT

To: **Hamlet of Fort Liard**

File: **34015**

Project: **Annual Water Plant Tests**

Parameter	Sample ID: Date Sampled: Unit	Reservoir #2 1515 Hrs. Mar. 8/11	Test Methods ① N/A	Date Analyzed	Analyst Initials
Sodium	mg/L	140	3120	Mar. 22/11	T.B.
Sulphate	mg/L	38	4110 B	Mar. 11/11	S.F.
Chloride	mg/L	24	4110 B	Mar. 11/11	S.F.
Fluoride	mg/L	0.13	4110 B	Mar. 11/11	S.F.
Nitrate	mg/L N	<0.05	4110 B	Mar. 11/11	S.F.
pH @ 25°C		8.09	4500-H <sup>+</sup> B	Mar. 15/11	T.H.
Conductivity @ 25°C	µmhos/cm	695	2510 B	Mar. 15/11	T.H.
Total Alkalinity (as CaCO <sub>3</sub> pH 4.3)	mg/L	318	2320 B	Mar. 16/11	T.B.
Total Hardness (as CaCO <sub>3</sub> )	mg/L	81	3120/Calculation	Mar. 22/11	T.B.
Total Dissolved Solids	mg/L	500	2540 C	Mar. 14/11	S.F.
Total Suspended Solids	mg/L	<2	2540 D	Mar. 14/11	S.F.
Colour	TCU	10	2120 B	Mar. 15/11	T.H.
Turbidity	NTU	0.86	2130 B	Mar. 15/11	T.H.
Extractable Aluminum	mg/L	<0.010	3120	Mar. 22/11	T.B.
Extractable Arsenic	mg/L	<0.0005	3114 C	Apr. 14/11	T.B.
Extractable Barium	mg/L	0.161	3120	Mar. 22/11	T.B.
Extractable Cadmium	mg/L	<0.002	3120	Mar. 22/11	T.B.
Extractable Chromium	mg/L	<0.002	3120	Mar. 22/11	T.B.
Extractable Copper	mg/L	<0.002	3120	Mar. 22/11	T.B.
Extractable Iron	mg/L	1.00	3120	Mar. 22/11	T.B.
Extractable Lead	mg/L	<0.0001	EPA 200.8	Mar. 20/11	E.X.
Extractable Manganese	mg/L	0.064	3120	Mar. 22/11	T.B.
Extractable Mercury	mg/L	<0.0005	3112	Apr. 5/11	T.B.
Extractable Selenium	mg/L	<0.0005	3114 C	Mar. 18/11	T.B.
Extractable Uranium	mg/L	<0.100	3120	Mar. 22/11	T.B.
Extractable Zinc	mg/L	0.014	3120	Mar. 22/11	T.B.
Cyanide	mg/L	<0.01	4500-CN <sup>-</sup> E	Mar. 18/11	E.W.
Total Organic Carbon	mg/L	5	5310 B	Mar. 15/11	T.B.
Dissolved Organic Carbon	mg/L	5	5310 B	Mar. 15/11	T.B.
<b>Trihalomethanes</b>					
Chloroform	µg/L	55.1	EPA 8260	Mar. 22/11	A.L.
Bromodichloromethane	µg/L	16	EPA 8260	Mar. 22/11	A.L.
Dibromochloromethane	µg/L	3	EPA 8260	Mar. 22/11	A.L.
Bromoform	µg/L	<1	EPA 8260	Mar. 22/11	A.L.

① Modified from Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition.

Note: Results relate only to the item tested.

alpha

**ALPHA LABORATORY SERVICES LTD.**

**Analytical and Consulting Services**

17225 - 109 Avenue

Edmonton, Alberta T5S 1H7

Phone: (780) 489-9100 Fax: (780) 489-9700

**TECHNICAL REPORT**

To: **Hamlet of Fort Liard**

File: **34015**

Project: **Annual Water Plant Tests**

---

Analysis Verified and  
Report Authorized by:

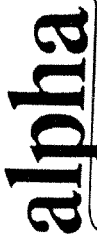
*Tuula Barclay*

*for*

Lisa Reinbolt  
Supervisor

Note: All samples will be disposed of 30 days after analysis. Please advise the laboratory if you require additional sample storage time.





**ALPHA LABORATORY SERVICES LTD.**  
**Analytical and Consulting Services**

17225 - 109 Avenue  
 Edmonton, Alberta T5S 1H7  
 Phone: (780) 489-9100 Fax: (780) 489-9700

**TECHNICAL REPORT**

To: **Hamlet of Fort Liard**  
**General Delivery**  
**Fort Liard NT X0G 0A0**

File: **34556**  
 Date Reported: **July 13, 2011**  
 Date Received: **June 30, 2011**  
 Client PO: **1800**  
 Attention: **Alan Harris**

Project: **Sewage Lagoon Testing**

Parameter	Unit	Sample ID:	Old Cell #1	Date Analyzed	Analyst Initials
		Lagoon #3 0430 Hrs. Date Sampled: Jun. 28/11	0430-1630 Hrs. Jun. 28/11		
pH @ 24°C		9.59	8.81	Jun. 30/11	T.H.
Conductivity @ 25°C	mg/L	801	669	Jun. 30/11	T.H.
Biochemical Oxygen Demand	mg/L	21	11	Jun. 30/11	S.F.
Carbonaceous Biochemical Oxygen Demand	mg/L	24	13	Jun. 30/11	S.F.
Total Dissolved Solids	mg/L	540	460	Jul. 6/11	S.F.
Total Suspended Solids	mg/L	19	12	Jul. 6/11	S.F.
Ammonia	mg/L N	0.08	0.22	Jul. 5/11	E.W.
Fecal Coliforms	CFU/100 mL	<1	<1	Jun. 30/11	T.H.

Parameter	Unit	Sample ID:	Test Methods
		Date Sampled:	① N/A
pH @ 25°C			4500H' B
Conductivity @ 25°C	mg/L		2510 B
Biochemical Oxygen Demand	mg/L		5210 B
Carbonaceous Biochemical Oxygen Demand	mg/L		5210 B
Total Dissolved Solids	mg/L		2540 C
Total Suspended Solids	mg/L		2540 D
Ammonia	mg/L N		4500-NH <sub>3</sub> D
Fecal Coliforms	CFU/100 mL		9222 A,D

① Modified from Standard Methods for the Examination of Water and Wastewater, 21<sup>st</sup> Edition.

Note: Results relate only to the item tested.

alpha

**ALPHA LABORATORY SERVICES LTD.**  
**Analytical and Consulting Services**

17225 - 109 Avenue  
Edmonton, Alberta T5S 1H7  
Phone: (780) 489-9100 Fax: (780) 489-9700

**TECHNICAL REPORT**

To: **Hamlet of Fort Liard**

File: **34556**

Project: **Sewage Lagoon Testing**

---

Analysis Verified and  
Report Authorized by:

*Tuula Barclay*  
for Lisa Reinbolt  
Supervisor

Note: All samples will be disposed of 30 days after analysis. Please advise the laboratory if you require additional sample storage time.