



Phone: 867-872-0750

Fax: 867-872-4250

April 4, 2023

Ms. Susan Christie, SAO  
Hamlet of Fort Providence  
Box 290  
Fort Providence, NT X0E 0L0

**Attention: Susan Christie - SAO**

**File Number** MV2016L3-0001  
**Type of Operation** Type B - MUNICIPAL  
**Location** Mackenzie River, Fort Providence NT.

Dear Susan Christie,

An inspection of the above noted operation was conducted on Sept 13<sup>th</sup>, 2022 by Water Resource Officers, Joshua Gauthier and Wendy Bidwell. Enclosed is a copy of the Municipal Water Use Inspection Report.

The water treatment plant was well organized and appeared to be operating normally during the inspection.

Items of concern noted during the inspection were mainly related to the domestic waste area at the landfill facility. Please attend to the items identified in the attached report as soon as feasible. Regular maintenance is required at this facility in order to meet operational needs. The Hamlet is advised to contact the Mackenzie Valley Land and Water Board (MVLWB) as well as Municipal and Community Affairs (MACA) for any support regarding these issues.

Please submit any outstanding administrative submissions to the Board as soon as feasible.

Please extend my thanks to Mr. McLeod for his assistance and the information provided during the inspection.

If you have any questions, please contact me at 867-872-0750.

Sincerely,

Joshua Gauthier  
Water Resource Officer  
Department of Environment and Natural Resources  
South Slave Region

Cc: Erica Janes – Regulatory Specialist - Mackenzie Valley Land and Water Board  
Rick Walbourne – Manager, Regulatory – ENR GNWT  
Wendy Bidwell – Senior Water Resource Officer – South Slave Region - ENR GNWT  
Tony Vermillion - Regional Superintendent - South Slave Region – ENR GNWT



MUNICIPAL WATER USE INSPECTION REPORT

LICENCE #:	MV2016L3-0001	EXPIRY DATE:	January 30, 2031
LICENCEE:	Hamlet of Fort Providence	PREVIOUS INSPECTION:	June 14, 2022
COMPANY REP:	Susan Christie	INSPECTION DATE:	September 13, 2022

WATER SUPPLY

Source:	Mackenzie River	Quantity Used:	8628.9 m3 since June 14 <sup>th</sup> , 2022
Owner/Operator:	Hamlet of Fort Providence	Meter Reading:	83287183 L

Indicate:      A - Acceptable      U - Unacceptable      N/A - Not Applicable      N/I - Not Inspected

Intake Facilities	A	Storage Structures	A	Treatment Systems	A	Recycling	N/A
Flow Meas. Device	A	Conveyance Lines	A	Pumping Stations	A	Chem. Storage	A
						Modifications	N/A

Water Supply Comments:

The Water Treatment Plant (WTP) was well organized, clean and operating normally at the time of the inspection. The daily pumping records kept at the water treatment plant were up to date. At the time of inspection the daily logs were complete and current. The raw water meter read 83287183 L/min and the truck fill indicator was 8782308 L/min. Raw samples were collected for analysis. Water Treatment Plant Operator, Clifford McLeod was present at the time of the inspection. Mr. McLeod accompanied the inspectors throughout the day for inspection of all facilities as he is also the acting Works Foreman.

During the inspection it was observed that contractors were working on the wetwell repairs for the municipality. Inspectors were not able speak with the crew conducting the work as it would have interfered with the inspection and sample collection. Mr. Mcleod also mentioned that the roof/ceiling repairs have not been completed this year and that he has been diligent in keeping the treatment process un-impacted by this planned work.

The raw water quality was acceptable and has been getting better with lower flows on the Mackenzie River. There was no boil water advisory in place at the time of inspection. Today the raw water turbidity was low (Raw: 2.110 NTU Treated: 0.174 NTU). The legal limit for post treatment turbidity varies among WTPs in the territories. Plant operators continue to be in constant contact with the Environmental Health Officer (EHO) for the region (Chirag Rohit) to ensure the highest safety standards for treated potable water.

Much of the equipment at the plant was functional at the time of inspection. The chemical reagents looked to be properly stored and no concerns noted. Mr. McLeod noted that he needs more de-chlorinator (Clear Tech). Mr. McLeod also mentioned that they were having issues with some of the plants testing kits. Inspectors recommended looking into requesting new equipment.



MUNICIPAL WATER USE INSPECTION REPORT

WASTE DISPOSAL – SEWAGE

Disposal Method		5 Cell Lagoon and Wetland					
Mechanical	No	Camp Sump	No	Natural Water Body	No	Wetland Treatment	Yes
Continuous Discharge	No	Intermittent Discharge	No	Seasonal Discharge	Yes	Land Spread	No
Accelerated Biological	No	Other	N/A				

Indicate:      A - Acceptable      U - Unacceptable      N/A - Not Applicable      N/I - Not Inspected

Discharge Quality	A	Decant Process & Structures	A	Discharge Measurement Device	N/I
Freeboard	A	Sludge Disposal Method	N/A		
Periods Of Discharge	Seasonal decant			SNP Samples Collected	1412-2
Effluent Discharge Rates					

Sewage Comments:

At the time of inspection the freeboard all five lagoon cells was acceptable, but regular monitoring of cells is required to gauge freeboard levels. Cell #5 will require seasonal decant prior to fall freeze up to ensure adequate space for spring run-off . Facility still requires brushing of vegetation around the cells. Any vegetation, or debris is to be removed to ensure proper operation and functioning of the treatment cells. On September 27<sup>th</sup> , 2022 - the Hamlet decanted cell #5 as per annual routine.

It was observed that cell #1 had lots of biosolids accumulating on its surface. This is likely a sign that the lagoon cell is receiving frequent inputs and not able to settle out on the bottom of the cell, or the sludge solids have overaccumulated. It is recommended that the Hamlet budget and plan for desludging of this treatment cell soon. Another big concern regarding this cell is that the discharge ramp liner appears to be detaching. This will require repairs in the near future as it is stipulated within the water license under condition D.5 to maintain and prevent any structural failures.

Please forward results of any recent sampling at SNP 1412-2 (Lagoon Outflow to Wetland) to the Inspector for review.



MUNICIPAL WATER USE INSPECTION REPORT

WASTE DISPOSAL – SOLID WASTE

Disposal Method		Landfill					
Open Dump	No	Landfill	Yes	Burn & Landfill	No	Underground	No
Offsite Removal	No	Other	N/A				
Owner / Operator	Hamlet of Fort Providence						

Indicate:      A - Acceptable      U - Unacceptable      N/A - Not Applicable      N/I - Not Inspected

Runoff Diversion	U	SNP Samples Collected	N/I
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Solid Waste Comments:

It needs to be reiterated that segregated waste streams need to be identified with signage for ease of organization and to inform land fill Users (i.e. Haz. Waste Area, Appliance Waste, Tires, etc.). More oversight of landfill activities is required to prevent the dumping of undesirable wastes. Better segregation and delineation of waste stream areas around the domestic waste pile is still required, especially the stockpiled vehicles and scrap metals. It was also noted that tires are being dumped closer to the entry gate area.

The hazardous wastes onsite are not contained and appropriately stored on site. There were many containers (buckets, bins, used oil containers, etc.) that were placed in one area, but many were still open, or not sealed properly. It is recommended that the Hamlet acquire a plastic tote to properly store these oils and chemicals in one container. This will make it easier to manage this area, if the Hamlet continues to be a receiver of these wastes. This would also help with reducing the risk of spills in this area. Any spills in this area must be cleaned up.

At the time of inspection all domestic waste was being deposited central to the new cell of the landfill. The landfill attendant (Mr.McLeod) has mentioned repeatedly that proper equipment is needed to manage the landfill more effectively and efficiently. The inspector acknowledges that the current lack of a compactor and dozer for this facility has lead to some undesirable conditions for the Hamlet. The facility is also currently dealing with the issue of pooling leachate underneath the domestic waste pile that is preventing access to the active cell. Further discussions and planning with MACA and MVLWB on how to manage and mitigate this ongoing issue is required.

More frequent cover at this facility would limit wind blown waste. Copious windblown debris was still noted in all areas of the facility, but concentrated in fenced perimeter areas. The north and west perimeter areas of the main waste pile had the most windblown debris. Lack of cover in the active domestic waste cell and poor management of hazardous wastes has attracted wildlife. Evidence of bears accessing and scavenging on wastes was present at the time of inspection (Figure 20). This issue must continue to be addressed as soon as possible.

The Construction, Demolition and Oversized waste pile across from the domestic waste has some waste that should not be there. Cooking oil and grease have been left on the ground, out in the open (Figure





MUNICIPAL WATER USE INSPECTION REPORT

30). These wildlife attractants pose a significant safety risk to Hamlet staff and the public. Deposit of these waste here may be due to the inaccessibility of the designated areas within the domestic waste area, but most likely due to unsupervised tipping by Users. This is why the landfill could use a part time Attendent to guide and direct Users. The construction waste was recently covered but the main concern is the unsupervised Users at the landfill dropping waste in the wrong areas.

SURVEILLANCE NETWORK PROGRAM

Samples Collected Licencee	Unknown		
Samples Collected ENR	1412-1, 1412-2, 2016-1, 2016-3		

Signs Posted:    SNP	Yes	Warning	No
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Surveillance Network Program Comments:

All sample results were within licence criteria limits.

GENERAL CONDITIONS/REPORTS/PLANS

Indicate:        A - Acceptable            U - Unacceptable        N/A - Not Applicable    N/I - Not Inspected

C & R Plan	N/I	Records & Reporting	N/I	Final Report	N/I
Geotechnical Inspection	N/I	Posting, Signage	U	Contingency Plan	N/I
Restorations Activities	N/A	Spills	U	O&M Plan	A
Maintenance	U	Modifications		Annual Report	N/I

General Condition Comments:

The SAO of Fort Providence (Susan Christie) was available to meet on the day of the inspection. Issues noted during the inspection were sent to the SAO in a post inspection summary email.

The greatest concern that was noted during the inspection was the pooling leachate at the domestic waste landfill area. This issue will need to be addressed moving forward as it is impairing the functioning of the landfill and not allowing access to the active cell. There should be some consideration put into developing an engineered leachate drainage/catchment system/structure (i.e lined evaporative leachate sump), so this issue doesn’t reoccur each year and hamper operations at the facility.

Maintenance of cell #1 at the Sewage Disposal facilities will need to be addressed moving forward. The detached liner will need to be fixed as it is structurally important in preventing erosion of the cell and its functioning. The Hamlet should budget and plan for de-sluding of this cell and possibly others soon.

Clean up and better management of the Hazardous waste area is still required. Reducing wildlife attractants with more frequent cover, proper disposal and controlling access to the landfill (i.e. reinforced perimeter fencing that prevents access by bears) is also required.



**MUNICIPAL WATER USE INSPECTION REPORT**  
**NON-COMPLIANCE/VIOLATIONS OF ACT OR LICENCE**

- 1. Operational maintenance work to be completed at domestic waste area in regards to the pooling leachate. The licensee shall take measures to minimize or eliminate standing water at the Solid Waste Disposal Facilities to the satisfaction of the inspector. Licence Condition D.18
- 2. Repairs are required for the liner at cell #1. As per License Condition D.5 the Sewage Disposal Facility shall be maintained and operated in a manner as to prevent structural failure.
- 3. Hazardous waste area needs to be properly maintained to prevent accidental spills by containerizing waste oils and other hazardous waste appropriately. The Licensee shall maintain the Solid Waste Facility to the Inspectors satisfaction. Licence Condition D.20
- 4. Outstanding submission of the Operation and Maintenance Plan for the Sewage Disposal facilities to the MVLWB since July 7<sup>th</sup>, 2017. Licence Condition E.3.
- 5. Outstanding submission of Operation and Maintenance Plan for the Water Treatment Plant to the MVLWB since July 7<sup>th</sup>, 2017. Licence Condition E.4.

Inspector’s Signature: \_\_\_\_\_  \_\_\_\_\_



MUNICIPAL WATER USE INSPECTION REPORT

INSPECTION IMAGES

Figure 1

Water Treatment Plant (WTP) - Daily Pumping Log.

Fort Providence  
Water Treatment Plant  
Daily Log

Date: TUE, SEPT 13/27  
Weather: SUNNY  
Temperature: 5 C  
TL: 08756066

Operator: CLIFF  
Water Truck Driver (1): GARNETT  
Water Truck Driver (2): GILBERT  
RW: 83271695

Reservoir # 1	Reservoir # 2	Raw Water	Reservoir # 1
<u>(2.110)</u>	<u>( )</u>	Turbidity: <u> </u> NTU	<u>( )</u>
Turbidity: <u>0.174</u> NTU	Turbidity: <u> </u> NTU	Color: <u> </u> TCU	Turbidity: <u> </u> NTU
Color: <u> </u> TCU	Color: <u> </u> TCU	PH: <u> </u>	Color: <u> </u> TCU
Free Cl2: <u>1.07</u> mg/L	Free Cl2: <u> </u> mg/L	Temp: <u> </u> C	Free Cl2: <u> </u> mg/L
Total Cl2: <u> </u> mg/L	Total Cl2: <u> </u> mg/L	Aluminum: <u> </u> mg/L	Total Cl2: <u> </u> mg/L
PH: <u> </u>	Aluminum: <u> </u> mg/L	Manganese: <u> </u> mg/L	Manganese: <u> </u> mg/L
Temp.: <u> </u> C	Time: <u> </u>	Total Iron: <u> </u> mg/L	Time: <u> </u>
Time: <u>9:15</u>		Time: <u> </u>	
Other Duties:		Comments:	
<input type="checkbox"/> Change Aluminum Drum	Time: <u> </u>		
<input type="checkbox"/> Change Hypochlor 12 Drum	Time: <u> </u>		
<input type="checkbox"/> Mix 60 grams Polymer to 50 L of water	Time: <u> </u>		
<input type="checkbox"/> Manual Backwash	Time: <u> </u>		
<input type="checkbox"/> Calibrate PH Meter	Time: <u> </u>		
<input type="checkbox"/> Weekly P.M. Schedule	Time: <u> </u>		
<input type="checkbox"/> Calibrate Chlorine Analyzer @ <u> </u> mg/L	Time: <u> </u>		
<input type="checkbox"/> Sample @ <u> </u> mg/L	Time: <u> </u>		
<input type="checkbox"/> Recalibrate			

13/09/2022

Figure 2

Water Treatment Plant (WTP) – Raw water flow meter/data logger.







MUNICIPAL WATER USE INSPECTION REPORT

Figure 3  
Water Treatment Plant (WTP) – Datasheet Log for day before inspection

Fort Providence  
Water Treatment Plant  
Daily Log

Date: Mon, Sept 12/2  
Weather: Sunny  
Temperature: 6 C  
TL: 08654988

Operator: CLIFF  
Water Truck Driver (1): GARETTE  
Water Truck Driver (2): GILBERT  
RW: 83139731

Reservoir # 1  
(2.165)

Turbidity: 0.201 NTU  
Color: \_\_\_\_\_ TCU  
Free Cl2: 0.15 mg/L  
Total Cl2: \_\_\_\_\_ mg/L  
PH: 6.98  
Temp.: 14.4 C  
Time: 9:20

Other Duties:  

Change Aluminum Drum  
Time: \_\_\_\_\_

Change Hypochlor 12 Drum  
Time: \_\_\_\_\_

☒ Mix 60 grams Polymer to 50 L of water  
Time: 11:15

Manual Backwash  
Time: \_\_\_\_\_

Calibrate PH Meter  
Time: \_\_\_\_\_

Weekly P.M. Schedule  
Time: \_\_\_\_\_

Calibrate Chlorine Analyzer @ \_\_\_\_\_ mg/L  
Sample @ \_\_\_\_\_ mg/L  
Time: \_\_\_\_\_

Recalibrate

Reservoir # 2  
( )

Turbidity: \_\_\_\_\_ NTU  
Color: \_\_\_\_\_ TCU  
Free Cl2: \_\_\_\_\_ mg/L  
Total Cl2: \_\_\_\_\_ mg/L  
Aluminum: \_\_\_\_\_ mg/L  
Time: \_\_\_\_\_

Raw Water  
Turbidity: \_\_\_\_\_ NTU  
Color: \_\_\_\_\_ TCU  
PH: \_\_\_\_\_  
Temp: \_\_\_\_\_ C  
Aluminum: \_\_\_\_\_ mg/L  
Manganese: \_\_\_\_\_ mg/L  
Total Iron: \_\_\_\_\_ mg/L  
Time: \_\_\_\_\_

Reservoir # 1  
(1.890)

Turbidity: 0.171 NTU  
Color: \_\_\_\_\_ TCU  
Free Cl2: 1.19 mg/L  
Total Cl2: \_\_\_\_\_ mg/L  
Manganese: \_\_\_\_\_ mg/L  
Time: 4:05

Comments:  
11:10 ADD 2-JUGS "CLOROX BLEACH 3528"  
TO WTR

13/09/2022

Figure 4  
Water Treatment Plant (WTP) – Backwash discharge pipe

13/09/2022

Date:	Sept 13, 2022	Licence #:	MV2016L3-0001	Page No:	7
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MUNICIPAL WATER USE INSPECTION REPORT

Figure 5  
Water Treatment Plant (WTP) – Wetwell repairs underway



Figure 6  
Water Treatment Plant – Pallet of Aluminum Sulphate







MUNICIPAL WATER USE INSPECTION REPORT

Figure 7  
Sewage Lagoon – Cell 1



Figure 8  
Sewage Lagoon – SNP Station 1412-2







MUNICIPAL WATER USE INSPECTION REPORT

Figure 9  
Sewage Lagoon – SNP Station 1412-2 sample area



Figure 10  
Landfill – Decommisioned vehicles SW side of domestic waste







MUNICIPAL WATER USE INSPECTION REPORT

Figure 11  
Landfill - Domestic waste pile looking North



Figure 12  
Landfill - Tire shreds Area







MUNICIPAL WATER USE INSPECTION REPORT

Figure 13  
Landfill – Domestic Waste Area Entry – Looking West



Figure 14  
Landfill – Domestic Waste Entry Area







MUNICIPAL WATER USE INSPECTION REPORT

Figure 15  
Landfill – Ridge of domestic waste area - Active cell looking South



Figure 16  
Landfill – Northern perimeter of domestic waste pile – Wildlife entry point







MUNICIPAL WATER USE INSPECTION REPORT

Figure 17  
Landfill – NW corner of perimeter fence



Figure 18  
Landfill – East side of domestic pile looking South. Scrap metal area







MUNICIPAL WATER USE INSPECTION REPORT

Figure 19  
Landfill – Grease pit in the NE corner of domestic waste area



Figure 20  
Landfill – NE corner showing the wildlife point of entry







MUNICIPAL WATER USE INSPECTION REPORT

Figure 21  
Landfill – Hazardous waste area



Figure 22  
Landfill – Hazardous waste area – Open Containers







MUNICIPAL WATER USE INSPECTION REPORT

Figure 23  
Landfill – Hazardous Waste Area – Spilled Oil



Figure 24  
Landfill – Hazardous Waste Area – Paint







MUNICIPAL WATER USE INSPECTION REPORT

Figure 25  
Landfill –Appliance Waste area



Figure 26  
Landfill – Construction waste area showing mixed waste being dumped







MUNICIPAL WATER USE INSPECTION REPORT

Figure 27  
Landfill – Construction waste area



Figure 28  
Landfill – SNP Station 2016-1 Entry Point







MUNICIPAL WATER USE INSPECTION REPORT

Figure 29  
Landfill – SNP Station 2016-1



Figure 30  
Landfill – Construction waste area – Close up







MUNICIPAL WATER USE INSPECTION REPORT

Figure 31  
Landfill – Hazardous Waste Area - Barrel



Figure 32  
Landfill – Hazardous Waste Area – Pressurized containers







MUNICIPAL WATER USE INSPECTION REPORT

SNP sample analysis:



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9  
Tel: (867)-767-9235 Fax: (867)-920-8740

**Taiga Batch No.:**  
**221912**

**- FINAL REPORT -**

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**Prepared For:** Fort Smith District Office

**Address:** Box 900  
Fort Smith, NT  
X0E 0P0

**Attn:** Wendy Bidwell

**Facsimile:** (867) 872-4250

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**Final report has been reviewed and approved by:**

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**Glen Hudy**  
**Quality Assurance Officer**

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**NOTES:**

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
  - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - Environment Canada
  - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

**ReportDate:** October-18-22

**Print Date:** *October-18-22*

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## Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:  
**221912**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: **1412-1**

Taiga Sample ID: **001**

**Client Project:** Hamlet of Fort Providence

**Sample Type:** Raw Water

**Received Date:** 14-Sep-22

**Sampling Date:** 13-Sep-22

**Sampling Time:** 10:38

**Location:** WTP and Sewage Lagoon Outflow

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Cations by ICP-MS</u></b>						
Calcium	31.2	0.1	mg/L	21-Sep-22	TEL035	
Hardness	109	0.7	mg/L	21-Sep-22	TEL035	
Magnesium	7.5	0.1	mg/L	21-Sep-22	TEL035	
Potassium	1.2	0.1	mg/L	21-Sep-22	TEL035	
Sodium	9.0	0.1	mg/L	21-Sep-22	TEL035	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	15-Sep-22	TEL068	
Phosphorous, Total	0.023	0.002	mg/L	16-Sep-22	TEL069	
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	82.3	0.4	mg/L	14-Sep-22	TEL060	
Colour, Apparent	74	5	CU	14-Sep-22	TEL051	
Conductivity, Specific (@25C)	242	0.4	µS/cm	14-Sep-22	TEL059	
pH	8.34		pH units	14-Sep-22	TEL058	
Solids, Total Dissolved	151	10	mg/L	16-Sep-22	TEL009	

**ReportDate:** October-18-22

**Print Date:** *October-18-22*

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Taiga Environmental Laboratory  
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9  
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:  
**221912**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: 1412-1**

**Taiga Sample ID: 001**

Solids, Total Suspended	20	3	mg/L	16-Sep-22	TEL008
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Turbidity	14.2	0.05	NTU	15-Sep-22	TEL006
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**Major Ions**

Chloride	8.6	0.7	mg/L	15-Sep-22	TEL055
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Fluoride	< 0.1	0.1	mg/L	15-Sep-22	TEL055
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Nitrate as Nitrogen	0.05	0.01	mg/L	15-Sep-22	TEL055
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Nitrate+Nitrite as Nitrogen	0.05	0.01	mg/L	15-Sep-22	TEL055
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Nitrite as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
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Sulphate	29	1	mg/L	15-Sep-22	TEL055
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**Trace Metals, Total**

Cadmium	< 0.04	0.04	µg/L	21-Sep-22	TEL035
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Chromium	0.3	0.1	µg/L	21-Sep-22	TEL035
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Cobalt	0.2	0.1	µg/L	21-Sep-22	TEL035
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Copper	2.9	0.2	µg/L	21-Sep-22	TEL035
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Iron	291	5	µg/L	21-Sep-22	TEL035
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Lead	1.2	0.1	µg/L	21-Sep-22	TEL035
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Manganese	9.6	0.1	µg/L	21-Sep-22	TEL035
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Nickel	1.5	0.1	µg/L	21-Sep-22	TEL035
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Zinc	4.9	0.4	µg/L	21-Sep-22	TEL035
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**ReportDate:** October-18-22

**Print Date:** *October-18-22*

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**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9  
Tel: (867)-767-9235 Fax: (867)-920-8740

**Taiga Batch No.:**  
**221912**

## **- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** 1412-2

**Taiga Sample ID:** 002

**Client Project:** Hamlet of Fort Providence

**Sample Type:** Treated Sewage

**Received Date:** 14-Sep-22

**Sampling Date:** 13-Sep-22

**Sampling Time:** 11:18

**Location:** WTP and Sewage Lagoon Outflow

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Cations by ICP-MS</u></b>						
Calcium	78.9	0.1	mg/L	21-Sep-22	TEL035	
Hardness	338	0.7	mg/L	21-Sep-22	TEL035	
Magnesium	34.3	0.1	mg/L	21-Sep-22	TEL035	
Potassium	32.1	0.1	mg/L	21-Sep-22	TEL035	
Sodium	93.6	0.1	mg/L	21-Sep-22	TEL035	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	12.7	0.005	mg/L	15-Sep-22	TEL068	
CBOD	20	2	mg/L	14-Sep-22	TEL019	
Phosphorous, Total	12.9	0.002	mg/L	16-Sep-22	TEL069	
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	334	0.4	mg/L	14-Sep-22	TEL060	
Colour, Apparent	434	5	CU	14-Sep-22	TEL051	
Conductivity, Specific (@25C)	1170	0.4	µS/cm	14-Sep-22	TEL059	
pH	8.11		pH units	14-Sep-22	TEL058	
Solids, Total Dissolved	695	10	mg/L	16-Sep-22	TEL009	
Solids, Total Suspended	45	3	mg/L	16-Sep-22	TEL008	

**ReportDate:** October-18-22

**Print Date:** October-18-22



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Taiga Batch No.:  
**221912**

**- CERTIFICATE OF ANALYSIS -**

Client Sample ID: **1412-2**

Taiga Sample ID: **002**

Turbidity	18.8	0.05	NTU	15-Sep-22	TEL006
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**Major Ions**

Chloride	116	0.7	mg/L	15-Sep-22	TEL055
Fluoride	< 0.1	0.1	mg/L	15-Sep-22	TEL055
Nitrate as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
Nitrite as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
Sulphate	100	1	mg/L	15-Sep-22	TEL055

**Microbiology**

Coliforms, Fecal	3	1	CFU/100mL	14-Sep-22	TEL017
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**Organics**

Oil and Grease, visible	Non-visible			14-Sep-22	Visual Exam
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**Subcontracted Organics**

Hexane Extractable Material	< 5.0	5	mg/L	30-Sep-22	APHA 5520B
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**Trace Metals, Total**

Cadmium	< 0.04	0.04	µg/L	21-Sep-22	TEL035
Chromium	0.2	0.1	µg/L	21-Sep-22	TEL035
Cobalt	0.3	0.1	µg/L	21-Sep-22	TEL035
Copper	0.4	0.2	µg/L	21-Sep-22	TEL035
Iron	131	5	µg/L	21-Sep-22	TEL035
Lead	< 0.1	0.1	µg/L	21-Sep-22	TEL035
Manganese	132	0.1	µg/L	21-Sep-22	TEL035
Nickel	3.3	0.1	µg/L	21-Sep-22	TEL035
Zinc	1.2	0.4	µg/L	21-Sep-22	TEL035

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Taiga Environmental Laboratory  
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:  
**221912**

## - CERTIFICATE OF ANALYSIS -

Client Sample ID: **2016-1**

Taiga Sample ID: **003**

Client Project: Hamlet of Fort Providence

Sample Type: Sewage Effluent Post Wetland

Received Date: 14-Sep-22

Sampling Date: 13-Sep-22

Sampling Time: 12:37

Location: WTP and Sewage Lagoon Outflow

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	0.098	0.005	mg/L	15-Sep-22	TEL068	
CBOD	41	2	mg/L	14-Sep-22	TEL019	
Phosphorous, Total	2.09	0.002	mg/L	16-Sep-22	TEL069	
<b><u>Inorganics - Physicals</u></b>						
pH	7.11		pH units	14-Sep-22	TEL058	
Solids, Total Suspended	676	3	mg/L	16-Sep-22	TEL008	
<b><u>Major Ions</u></b>						
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	330	10	CFU/100mL	14-Sep-22	TEL017	20
<b><u>Subcontracted Organics</u></b>						
Hexane Extractable Material	< 5.0	5	mg/L	30-Sep-22	APHA 5520B	

ReportDate: October-18-22

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**Taiga Batch No.:**  
**221912**

## **- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** 2016-3

**Taiga Sample ID:** 004

**Client Project:** Hamlet of Fort Providence

**Sample Type:** Pondered Leachate at LCWA

**Received Date:** 14-Sep-22

**Sampling Date:** 13-Sep-22

**Sampling Time:** 12:16

**Location:** WTP and Sewage Lagoon Outflow

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Cations by ICP-MS</u></b>						
Calcium	70.8	0.1	mg/L	21-Sep-22	TEL035	
Hardness	335	0.7	mg/L	21-Sep-22	TEL035	
Magnesium	38.6	0.1	mg/L	21-Sep-22	TEL035	
Potassium	20.6	0.1	mg/L	21-Sep-22	TEL035	
Sodium	52.0	0.1	mg/L	21-Sep-22	TEL035	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	15-Sep-22	TEL068	
Biochemical Oxygen Demand	3	2	mg/L	14-Sep-22	TEL019	
Phosphorous, Total	0.051	0.002	mg/L	16-Sep-22	TEL069	
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	294	0.4	mg/L	14-Sep-22	TEL060	
Colour, Apparent	65	5	CU	14-Sep-22	TEL051	
Conductivity, Specific (@25C)	877	0.4	µS/cm	14-Sep-22	TEL059	
pH	7.85		pH units	14-Sep-22	TEL058	
Solids, Total Dissolved	531	10	mg/L	16-Sep-22	TEL009	
Solids, Total Suspended	6	3	mg/L	16-Sep-22	TEL008	

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Taiga Batch No.:  
**221912**

**- CERTIFICATE OF ANALYSIS -**

Client Sample ID: **2016-3**

Taiga Sample ID: **004**

Turbidity	1.46	0.05	NTU	15-Sep-22	TEL006
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**Major Ions**

Chloride	83.8	0.7	mg/L	15-Sep-22	TEL055
Fluoride	0.1	0.1	mg/L	15-Sep-22	TEL055
Nitrate as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
Nitrite as Nitrogen	< 0.01	0.01	mg/L	15-Sep-22	TEL055
Sulphate	49	1	mg/L	15-Sep-22	TEL055

**Microbiology**

Coliforms, Fecal	48	1	CFU/100mL	14-Sep-22	TEL017
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**Organics**

Oil and Grease, visible	Non-visible			14-Sep-22	Visual Exam
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**Subcontracted Organics**

Benzene	< 0.00050	0.0005	mg/L	22-Sep-22	EPA 5021
Ethylbenzene	< 0.00050	0.0005	mg/L	22-Sep-22	EPA 5021
F2: C10-C16	< 0.30	0.3	mg/L	22-Sep-22	EPA3510
F3: C16-C34	< 0.30	0.3	mg/L	22-Sep-22	EPA3510
F4: C34-C50	< 0.30	0.3	mg/L	22-Sep-22	EPA3510
Hexane Extractable Material	< 5.0	5	mg/L	03-Oct-22	APHA 5520B
Toluene	< 0.00050	0.0005	mg/L	22-Sep-22	EPA 5021
Xylenes	< 0.00050	0.0005	mg/L	22-Sep-22	EPA 5021

**Trace Metals, Total**

Aluminum	15.1	0.6	µg/L	21-Sep-22	TEL035
Antimony	0.2	0.1	µg/L	21-Sep-22	TEL035
Arsenic	1.5	0.2	µg/L	21-Sep-22	TEL035

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**Taiga Batch No.:**  
**221912**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: 2016-3**

**Taiga Sample ID: 004**

Barium	133	0.1	µg/L	21-Sep-22	TEL035
Beryllium	< 0.1	0.1	µg/L	21-Sep-22	TEL035
Cadmium	< 0.04	0.04	µg/L	21-Sep-22	TEL035
Cesium	< 0.1	0.1	µg/L	21-Sep-22	TEL035
Chromium	0.1	0.1	µg/L	21-Sep-22	TEL035
Cobalt	0.2	0.1	µg/L	21-Sep-22	TEL035
Copper	0.2	0.2	µg/L	21-Sep-22	TEL035
Iron	152	5	µg/L	21-Sep-22	TEL035
Lead	< 0.1	0.1	µg/L	21-Sep-22	TEL035
Lithium	14.9	0.2	µg/L	21-Sep-22	TEL035
Manganese	64.2	0.1	µg/L	21-Sep-22	TEL035
Molybdenum	0.7	0.1	µg/L	21-Sep-22	TEL035
Nickel	1.2	0.1	µg/L	21-Sep-22	TEL035
Rubidium	3.4	0.1	µg/L	21-Sep-22	TEL035
Selenium	< 0.3	0.3	µg/L	21-Sep-22	TEL035
Silver	< 0.1	0.1	µg/L	21-Sep-22	TEL035
Strontium	440	0.1	µg/L	21-Sep-22	TEL035
Thallium	< 0.1	0.1	µg/L	21-Sep-22	TEL035
Titanium	0.6	0.1	µg/L	21-Sep-22	TEL035
Uranium	0.6	0.1	µg/L	21-Sep-22	TEL035
Vanadium	0.3	0.1	µg/L	21-Sep-22	TEL035
Zinc	0.9	0.4	µg/L	21-Sep-22	TEL035

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Taiga Batch No.:  
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**- CERTIFICATE OF ANALYSIS -**

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Client Sample ID: **2016-3**

Taiga Sample ID: **004**

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**- DATA QUALIFIERS -**

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*Data Qualifier Descriptions:*

**20**      *Possible matrix interference, reported result uncertain.*

**\* Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

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