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 June 14th, 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 poor leachate management in the domestic waste area of the Landfill. 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 requirements. 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 this issue.

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:**	**September 21, 2021**
COMPANY REP:	**Susan Christie**	**INSPECTION DATE:**	**June 14, 2022**

WATER SUPPLY

Source:	Mackenzie River	Quantity Used:	20,617.3 m3 since September 21, 2021
Owner/Operator:	Hamlet of Fort Providence	Meter Reading:	74658286 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:

Daily pumping records are kept at the water treatment plant. At the time of inspection the daily pumping logs were complete and current. There was an emergency situation last December, when the water intake pump stopped functioning. This had the community rationing water and getting water trucked in from Hay River. The Hamlet had the new pump installed and has a backup in case the situation reoccured. The raw water meter read 74658286 L/min and the truck fill indicator was 2411034 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.

Treatment includes flocculation, settling, filtration and disinfection, and the raw water quality 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 is high compared to normal levels (Raw: 7.32 NTU Treated: 0.76 NTU). The legal limit for post treatment turbidity varies among WTPs in the territories. The 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 in the plant is older but still functional. Mr. McLeod noted that there might be some construction happening to the roof of the plant building as part of the plant refurbishment. This work should not disrupt plant operations. The chemical reagents looked to be properly stored and no concerns noted. Mr. McLeod noted that he may need some magnesium (Mg) for treatment and will be ordering these reagents.

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/A
Freeboard	A	Sludge Disposal Method	A		
Periods Of Discharge	Seasonal decant			SNP Samples Collected	1412-2
Effluent Discharge Rates	N/A				

Sewage Comments:

At the time of inspection the freeboard in all five lagoon cells was acceptable, but cells will require decanting if effluent levels increase. Facility requires brushing of vegetation around all the cells. Any vegetation, or debris is to be removed to ensure proper operation and functioning of the treatment cells. Please forward results of any recent sampling at SNP 1412-2 (Lagoon Outflow to Wetland) to the Inspector for review.

Cell 5 visually appeared light green on the day of inspection. Usually indicating high nitrogen and nutrients levels. In the analytical sample results, this was reflected in multiple parameters (see attached results below). This may have just been due to the increase in temperatures with spring shifting towards summer (hotter temperatures). Overall the sewage lagoon was in good condition.

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

Solid Waste Comments:

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 of waste streams around the domestic waste pile is still required, especially the stockpiled vehicles and scrap metals. Majority of stored tires onsite were shredded. The remaining intact tires were not shredded due some of them having rims still attached.

The hazardous waste area is in poor condition and spills were noted at the time of inspection. Wastes are not contained ,or appropriately stored on site. There were many containers (buckets, bins, used oil containers, etc.) that were placed in one area, but many were open, or not sealed. It is recommended that the Hamlet acquire a plastic tote to properly store 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, the cooking grease disposal pit 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 be addressed as soon as possible. The Construction, Demolition and Oversized waste pile across from the domestic waste area has some waste items that should not be there (Figure 26 & 27). Used vehicle batteries and some appliances have been left in this area, and now the attendant must move them to the appropriate location. This 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

MUNICIPAL WATER USE INSPECTION REPORT

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	A

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 most critical 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 a proper, 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.

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

Achieving more segregation by waste type would serve the Hamlet in many ways moving forward. Usable space is limited within the domestic waste area currently. Better segregation of waste streams would free up space, if areas were used more efficiently.

NON-COMPLIANCE/VIOLATIONS OF ACT OR LICENCE

1. Operational maintenance work to be completed at domestic waste area in regards to the pooling leachate. Licence Condition D.18

2. Hazardous waste area needs to be properly maintained to prevent accidental spills by containerizing waste oils and other hazardous waste appropriately. Licence Condition D.20

3. Outstanding submission of the Operation and Maintenance Plan for the Sewage Disposal facilities to the MVLWB since July 7th, 2017. Licence Condition E.3.

4. Outstanding submission of Operation and Maintenance Plan for the Water Treatment Plant to the MVLWB since July 7th, 2017. Licence Condition E.4.

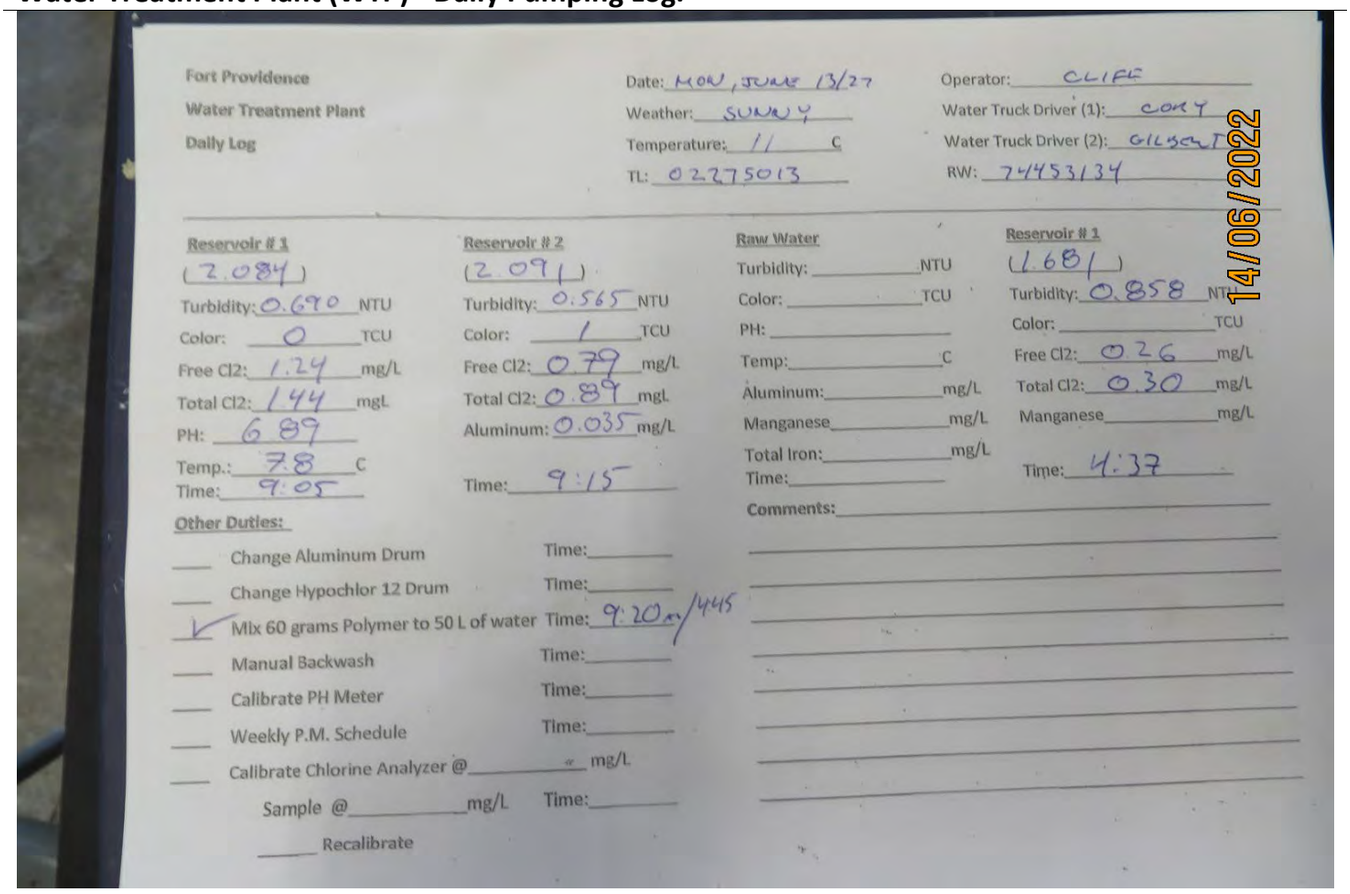
Inspector's Signature:____ Joshua Gauthier _____

MUNICIPAL WATER USE INSPECTION REPORT

INSPECTION IMAGES

Figure 1

Water Treatment Plant (WTP) - Daily Pumping Log.



Fort Providence
Water Treatment Plant
Daily Log

Date: MON, JUNE 13/22
Weather: SUNNY
Temperature: 11 C
TL: 02275013

Operator: CLIFF
Water Truck Driver (1): CORY
Water Truck Driver (2): GILBERT
RW: 74453134

14/06/2022

Reservoir # 1 (2.084)
Turbidity: 0.690 NTU
Color: 0 TCU
Free Cl2: 1.24 mg/L
Total Cl2: 1.44 mgL
PH: 6.89
Temp.: 7.8 C
Time: 9:05

Reservoir # 2 (2.091)
Turbidity: 0.565 NTU
Color: 1 TCU
Free Cl2: 0.79 mg/L
Total Cl2: 0.89 mgL
Aluminum: 0.035 mg/L
Time: 9:15

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

Reservoir # 1 (1.681)
Turbidity: 0.858 NTU
Color: TCU
Free Cl2: 0.26 mg/L
Total Cl2: 0.30 mg/L
Manganese mg/L
Time: 4:37

Comments:

Other Duties:
___ Change Aluminum Drum Time:
___ Change Hypochlor 12 Drum Time:
✓ Mix 60 grams Polymer to 50 L of water Time: 9:20 a.m./445
___ Manual Backwash Time:
___ Calibrate PH Meter Time:
___ Weekly P.M. Schedule Time:
___ Calibrate Chlorine Analyzer @ mg/L
Sample @ mg/L Time:
___ Recalibrate

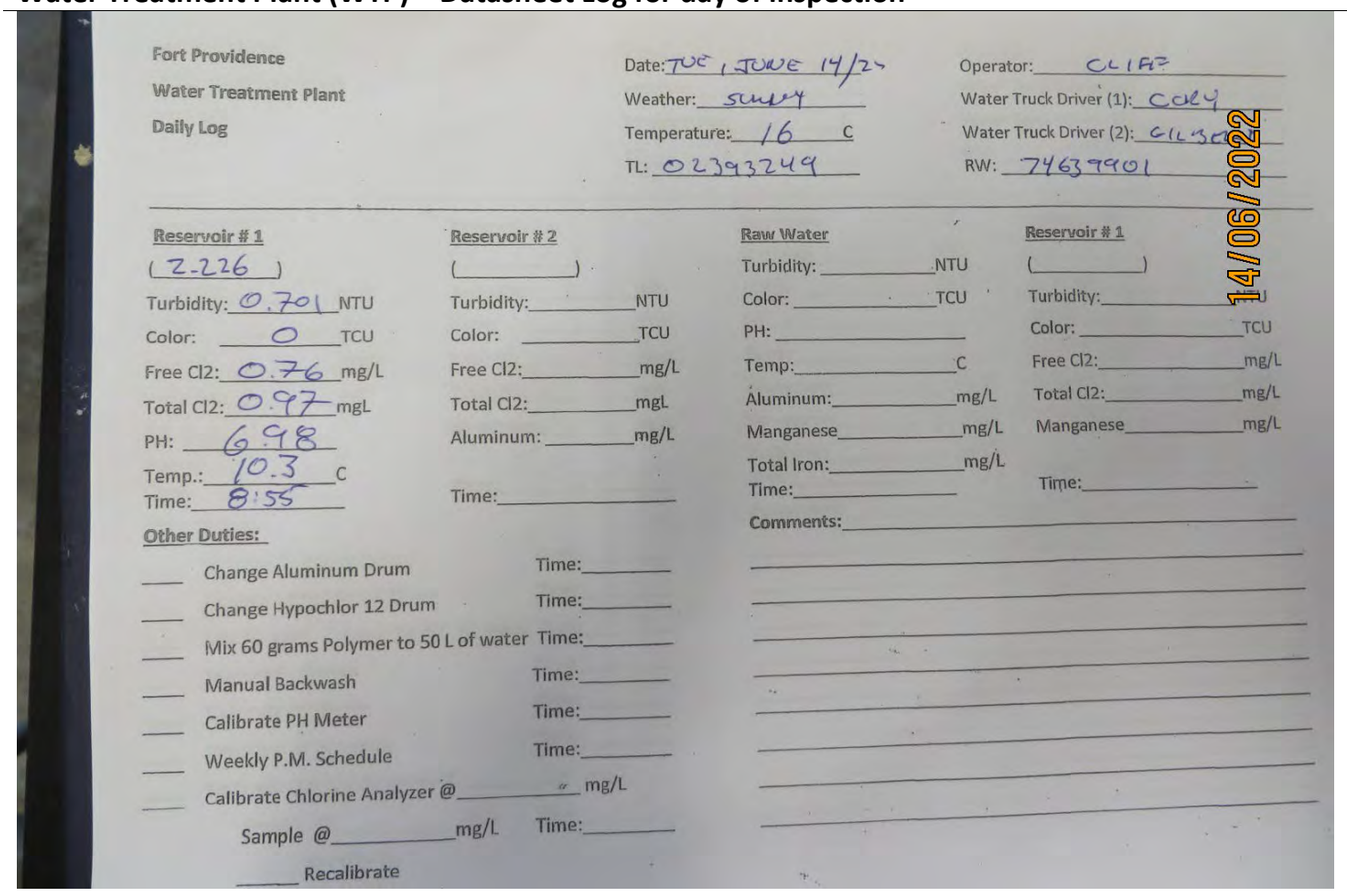
Figure 2

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 of inspection



Fort Providence
Water Treatment Plant
Daily Log

Date: TUE, JUNE 14/22
Weather: SUNNY
Temperature: 16 C
TL: 02393249

Operator: CLIFF
Water Truck Driver (1): CORY
Water Truck Driver (2): GILSON
RW: 74639901

14/06/2022

Reservoir # 1 (2-226)
Turbidity: 0.701 NTU
Color: 0 TCU
Free Cl2: 0.76 mg/L
Total Cl2: 0.97 mgL
PH: 6.98
Temp.: 10.3 C
Time: 8:55

Reservoir # 2 (_____)
Turbidity: _____ NTU
Color: _____ TCU
Free Cl2: _____ mg/L
Total Cl2: _____ mgL
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 (_____)
Turbidity: _____ U
Color: _____ TCU
Free Cl2: _____ mg/L
Total Cl2: _____ mg/L
Manganese _____ mg/L
Time: _____

Other Duties:
___ Change Aluminum Drum Time: _____
___ Change Hypochlor 12 Drum Time: _____
___ Mix 60 grams Polymer to 50 L of water Time: _____
___ Manual Backwash Time: _____
___ Calibrate PH Meter Time: _____
___ Weekly P.M. Schedule Time: _____
___ Calibrate Chlorine Analyzer @ _____ mg/L
Sample @ _____ mg/L Time: _____
_____ Recalibrate

Comments: _____

Figure 4

Water Treatment Plant (WTP) – Backwash discharge pipe

MUNICIPAL WATER USE INSPECTION REPORT

Figure 5

Water Treatment Plant (WTP) - Wetwell

Figure 6

Landfill access road drainage ditch

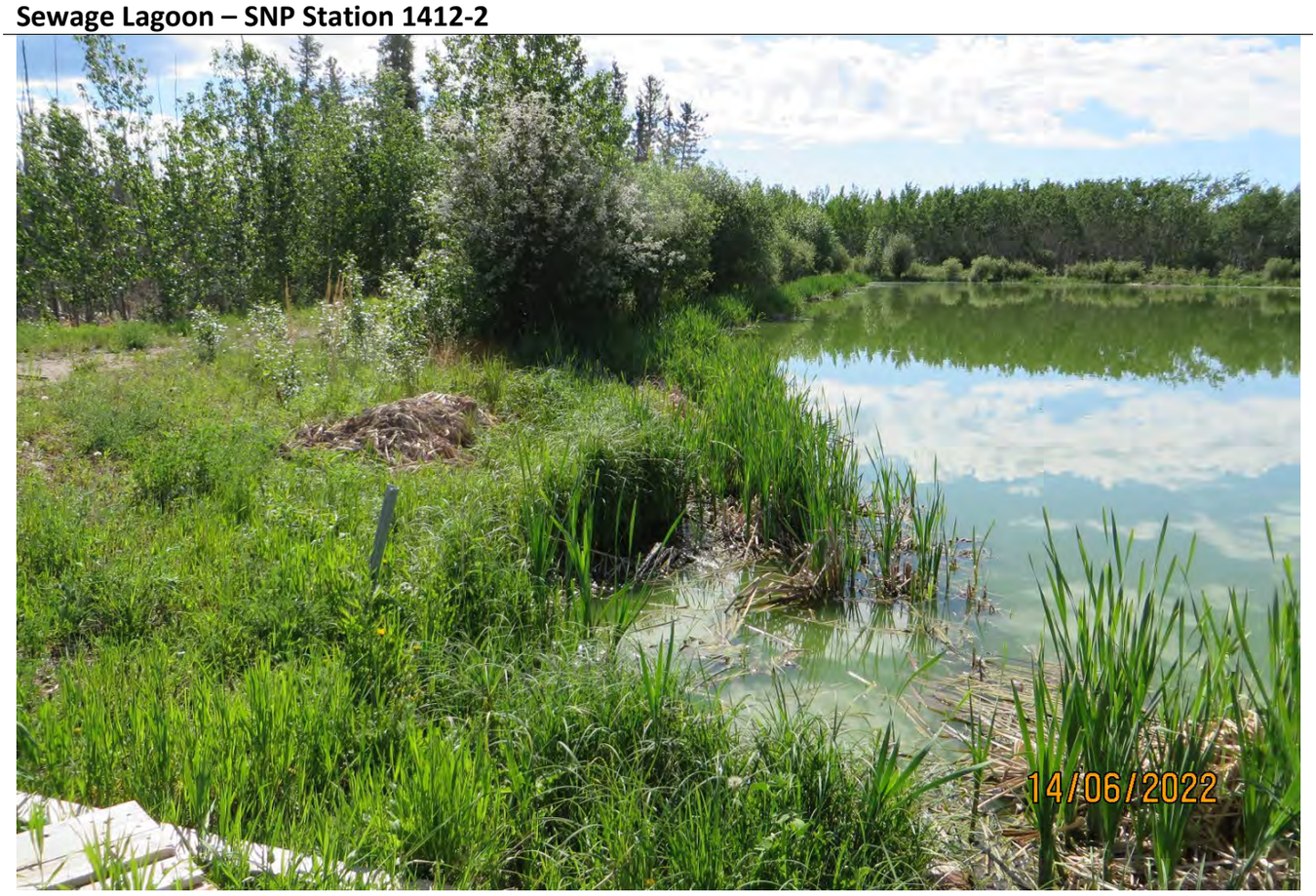
MUNICIPAL WATER USE INSPECTION REPORT

Figure 7

Sewage Lagoon – Cell 1 inlet

Figure 8

Sewage Lagoon – SNP Station 1412-2



MUNICIPAL WATER USE INSPECTION REPORT

Figure 9

Sewage Lagoon – SNP Station sign

Figure 10

Landfill – Decommisioned vehicles SE side of domestic waste

Figure 11

Landfill - Domestic waste pile looking North

Figure 12

Landfill – Pooling water and old tire shreds

Figure 13

Landfill – Closer up view of tire shreds and wet conditions

Figure 14

Landfill – Current domestic waste cell being used and leachate clearly visible

MUNICIPAL WATER USE INSPECTION REPORT

Figure 15

Landfill – Ridge of new cell looking south

Figure 16

Landfill – Northern perimeter of domestic waste pile.

MUNICIPAL WATER USE INSPECTION REPORT

Figure 17

Landfill – NW corner perimeter fence fixed

Figure 18

Landfill – West side of domestic pile looking South. Scrap metal area

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 with many open and improperly stored oils

Figure 22

Landfill – Hazardous waste area

MUNICIPAL WATER USE INSPECTION REPORT

Figure 23

Landfill – Appliance Waste area looking West

Figure 24

Landfill – Tire shreds and looking at the entry gate

MUNICIPAL WATER USE INSPECTION REPORT

Figure 25

Landfill – Construction waste with some water pooling

Figure 26

Landfill – Construction waste area showing mixed appliances being dumped

MUNICIPAL WATER USE INSPECTION REPORT

Figure 27

Landfill – Construction waste area. Batteries left on the ground

Figure 28

Landfill – SNP Station 2016-3

Figure 29

Landfill – SNP Station 2016-1

Figure 30

Landfill – Miscellaneous metal beside Domestic Waste Area

MUNICIPAL WATER USE INSPECTION REPORT

SNP Sample Results:

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

Taiga Batch No.: 221115

- FINAL REPORT -

Prepared For: Fort Smith District Office

Address: Box 900
Fort Smith,NT
X0E 0P0

Attn: **Wendy Bidwell** **Facsimile: (867) 872-4250**

Final report has been reviewed and approved by:

Glen Hudy
Quality Assurance Officer

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: July-11-22
Print Date: *July-13-22*

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

Taiga Batch No.: 221115

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 1412-1 **Taiga Sample ID:** 001

Client Project: Hamlet of Fort Providence
Sample Type: Raw Water
Received Date: 15-Jun-22
Sampling Date: 14-Jun-22
Sampling Time: 10:29
Location: WTP and Sewage Lagoon Outflow
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	22-Jun-22	TEL068	
Phosphorous, Total	0.019	0.002	mg/L	16-Jun-22	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	72.7	0.4	mg/L	16-Jun-22	TEL060	
Colour, Apparent	67	5	CU	15-Jun-22	TEL051	
Conductivity, Specific (@25C)	214	0.4	µS/cm	16-Jun-22	TEL059	
pH	8.04		pH units	16-Jun-22	TEL058	
Solids, Total Dissolved	162	10	mg/L	22-Jun-22	TEL009	
Solids, Total Suspended	8	3	mg/L	22-Jun-22	TEL008	
Turbidity	7.32	0.05	NTU	16-Jun-22	TEL006	
Major Ions						
Calcium	28.2	0.1	mg/L	17-Jun-22	TEL055	
Chloride	7.2	0.7	mg/L	17-Jun-22	TEL055	
Fluoride	< 0.1	0.1	mg/L	17-Jun-22	TEL055	

ReportDate: July-11-22
Print Date: *July-13-22*

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

Taiga Batch No.: 221115

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 1412-1 **Taiga Sample ID:** 001

Hardness	98.9	0.7	mg/L	17-Jun-22	TEL055
Magnesium	6.9	0.1	mg/L	17-Jun-22	TEL055
Nitrate as Nitrogen	0.10	0.01	mg/L	17-Jun-22	TEL055
Nitrate+Nitrite as Nitrogen	0.10	0.01	mg/L	17-Jun-22	TEL055
Nitrite as Nitrogen	< 0.01	0.01	mg/L	17-Jun-22	TEL055
Potassium	1.4	0.1	mg/L	17-Jun-22	TEL055
Sodium	7.7	0.1	mg/L	17-Jun-22	TEL055
Sulphate	26	1	mg/L	17-Jun-22	TEL055
Trace Metals, Total					
Cadmium	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Chromium	0.4	0.1	µg/L	22-Jun-22	TEL035
Cobalt	0.2	0.1	µg/L	22-Jun-22	TEL035
Copper	31.4	0.2	µg/L	22-Jun-22	TEL035
Iron	329	5	µg/L	22-Jun-22	TEL035
Lead	3.2	0.1	µg/L	22-Jun-22	TEL035
Manganese	9.3	0.1	µg/L	22-Jun-22	TEL035
Nickel	10.7	0.1	µg/L	22-Jun-22	TEL035
Zinc	61.2	5	µg/L	22-Jun-22	TEL035

ReportDate: July-11-22
Print Date: *July-13-22*

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

Taiga Batch No.: 221115

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 1412-2 **Taiga Sample ID:** 002

Client Project: Hamlet of Fort Providence
Sample Type: Treated Sewage
Received Date: 15-Jun-22
Sampling Date: 14-Jun-22
Sampling Time: 11:03
Location: WTP and Sewage Lagoon Outflow
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	20.2	0.005	mg/L	22-Jun-22	TEL068	
CBOD	13	2	mg/L	15-Jun-22	TEL019	
Phosphorous, Total	5.16	0.002	mg/L	16-Jun-22	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	312	0.4	mg/L	16-Jun-22	TEL060	
Colour, Apparent	540	5	CU	15-Jun-22	TEL051	
Conductivity, Specific (@25C)	952	0.4	µS/cm	16-Jun-22	TEL059	
pH	9.09		pH units	16-Jun-22	TEL058	
Solids, Total Dissolved	576	10	mg/L	22-Jun-22	TEL009	
Solids, Total Suspended	36	3	mg/L	22-Jun-22	TEL008	
Turbidity	44.0	0.05	NTU	16-Jun-22	TEL006	
Major Ions						
Calcium	58.6	0.1	mg/L	17-Jun-22	TEL055	
Chloride	92.7	0.7	mg/L	17-Jun-22	TEL055	
Fluoride	< 0.1	0.1	mg/L	17-Jun-22	TEL055	
Hardness	260	0.7	mg/L	17-Jun-22	TEL055	

ReportDate: July-11-22
Print Date: *July-13-22*

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

Taiga Batch No.: 221115

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 1412-2 **Taiga Sample ID:** 002

Magnesium	27.5	0.1	mg/L	17-Jun-22	TEL055
Nitrate as Nitrogen	0.33	0.01	mg/L	17-Jun-22	TEL055
Nitrate+Nitrite as Nitrogen	0.69	0.01	mg/L	17-Jun-22	TEL055
Nitrite as Nitrogen	0.35	0.01	mg/L	17-Jun-22	TEL055
Potassium	26.5	0.1	mg/L	17-Jun-22	TEL055
Sodium	74.6	0.1	mg/L	17-Jun-22	TEL055
Sulphate	72	1	mg/L	17-Jun-22	TEL055
Microbiology					
Coliforms, Fecal	2	1	CFU/100mL	15-Jun-22	TEL017
Organics					
Hexane Extractable Material	< 2.0	2	mg/L	16-Jun-22	TEL072
Oil and Grease, visible	Non-visible			15-Jun-22	Visual Exam
Trace Metals, Total					
Cadmium	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Chromium	0.2	0.1	µg/L	22-Jun-22	TEL035
Cobalt	0.4	0.1	µg/L	22-Jun-22	TEL035
Copper	1.1	0.2	µg/L	22-Jun-22	TEL035
Iron	78	5	µg/L	22-Jun-22	TEL035
Lead	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Manganese	13.8	0.1	µg/L	22-Jun-22	TEL035
Nickel	3.3	0.1	µg/L	22-Jun-22	TEL035
Zinc	< 5.0	5	µg/L	22-Jun-22	TEL035

ReportDate: July-11-22
Print Date: *July-13-22*

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

Taiga Batch No.: 221115

- 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: 15-Jun-22
Sampling Date: 14-Jun-22
Sampling Time: 12:47
Location: WTP and Sewage Lagoon Outflow
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.024	0.005	mg/L	22-Jun-22	TEL068	
CBOD	5	2	mg/L	15-Jun-22	TEL019	
Phosphorous, Total	0.370	0.002	mg/L	16-Jun-22	TEL069	
Inorganics - Physicals						
pH	6.88		pH units	07-Jul-22	TEL058	11
Solids, Total Suspended	36	3	mg/L	22-Jun-22	TEL008	
Major Ions						
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	17-Jun-22	TEL055	
Microbiology						
Coliforms, Fecal	< 1	1	CFU/100mL	15-Jun-22	TEL017	
Organics						
Hexane Extractable Material	< 2.0	2	mg/L	17-Jun-22	TEL072	

ReportDate: July-11-22
Print Date: *July-13-22*

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

Taiga Batch No.: 221115

- CERTIFICATE OF ANALYSIS -

Client Sample ID: 2016-3 **Taiga Sample ID:** 004

Client Project: Hamlet of Fort Providence
Sample Type: Ponded Leachate at LCWA
Received Date: 15-Jun-22
Sampling Date: 14-Jun-22
Sampling Time: 12:29
Location: WTP and Sewage Lagoon Outflow
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.019	0.005	mg/L	22-Jun-22	TEL068	
Biochemical Oxygen Demand	< 2	2	mg/L	15-Jun-22	TEL019	
Phosphorous, Total	0.039	0.002	mg/L	16-Jun-22	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	234	0.4	mg/L	16-Jun-22	TEL060	
Colour, Apparent	86	5	CU	15-Jun-22	TEL051	
Conductivity, Specific (@25C)	750	0.4	µS/cm	16-Jun-22	TEL059	
pH	7.74		pH units	16-Jun-22	TEL058	
Solids, Total Dissolved	510	10	mg/L	22-Jun-22	TEL009	
Solids, Total Suspended	< 3	3	mg/L	22-Jun-22	TEL008	
Turbidity	0.85	0.05	NTU	16-Jun-22	TEL006	
Major Ions						
Calcium	81.3	0.1	mg/L	17-Jun-22	TEL055	
Chloride	51.4	0.7	mg/L	17-Jun-22	TEL055	
Fluoride	0.1	0.1	mg/L	17-Jun-22	TEL055	
Hardness	328	0.7	mg/L	17-Jun-22	TEL055	

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Magnesium	30.2	0.1	mg/L	17-Jun-22	TEL055	
Nitrate as Nitrogen	< 0.01	0.01	mg/L	17-Jun-22	TEL055	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	17-Jun-22	TEL055	
Nitrite as Nitrogen	< 0.01	0.01	mg/L	17-Jun-22	TEL055	
Potassium	13.5	0.1	mg/L	17-Jun-22	TEL055	
Sodium	31.4	0.1	mg/L	17-Jun-22	TEL055	
Sulphate	87	1	mg/L	17-Jun-22	TEL055	
Microbiology						
Coliforms, Fecal	5	1	CFU/100mL	15-Jun-22	TEL017	208
Organics						
Benzene	< 2.0	2	ug/L	27-Jun-22	TEL075	
Ethylbenzene	< 2.0	2	ug/L	27-Jun-22	TEL075	
F2: C10-C16	< 0.2	0.2	mg/L	23-Jun-22	TEL067	
F3: C16-C34	< 0.2	0.2	mg/L	23-Jun-22	TEL067	
F4: C34-C50	< 0.2	0.2	mg/L	23-Jun-22	TEL067	
Hexane Extractable Material	< 2.0	2	mg/L	17-Jun-22	TEL072	
Hydrocarbons, Total Extractable	< 0.2	0.2	mg/L	23-Jun-22	TEL067	
Oil and Grease, visible	Non-visible			15-Jun-22	Visual Exam	
Toluene	< 2.0	2	ug/L	27-Jun-22	TEL075	
Xylenes	< 2.0	2	ug/L	27-Jun-22	TEL075	
Trace Metals, Total						
Aluminum	17.7	5	µg/L	22-Jun-22	TEL035	
Antimony	0.2	0.1	µg/L	22-Jun-22	TEL035	
Arsenic	1.5	0.2	µg/L	22-Jun-22	TEL035	
Barium	96.3	0.1	µg/L	22-Jun-22	TEL035	

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Beryllium	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Cadmium	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Cesium	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Chromium	0.1	0.1	µg/L	22-Jun-22	TEL035
Cobalt	0.2	0.1	µg/L	22-Jun-22	TEL035
Copper	0.5	0.2	µg/L	22-Jun-22	TEL035
Iron	266	5	µg/L	22-Jun-22	TEL035
Lead	0.1	0.1	µg/L	22-Jun-22	TEL035
Lithium	10.5	0.2	µg/L	22-Jun-22	TEL035
Manganese	174	0.1	µg/L	22-Jun-22	TEL035
Molybdenum	0.8	0.1	µg/L	22-Jun-22	TEL035
Nickel	1.2	0.1	µg/L	22-Jun-22	TEL035
Rubidium	2.1	0.1	µg/L	22-Jun-22	TEL035
Selenium	< 0.5	0.5	µg/L	22-Jun-22	TEL035
Silver	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Strontium	342	0.1	µg/L	22-Jun-22	TEL035
Thallium	< 0.1	0.1	µg/L	22-Jun-22	TEL035
Titanium	0.6	0.1	µg/L	22-Jun-22	TEL035
Uranium	0.7	0.1	µg/L	22-Jun-22	TEL035
Vanadium	0.2	0.1	µg/L	22-Jun-22	TEL035
Zinc	< 5.0	5	µg/L	22-Jun-22	TEL035

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- DATA QUALIFERS -

Data Qualifier Descriptions:

11 *Holding time exceeded before sample analysis.*

208 *Unreliable: Matrix interference*

*** 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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