

## Municipal Water Licence Annual Report

### Town of Norman Wells

Licence Number: S18L3-003 (renewal of S07L3-002)

Reporting year: 2018

*The Licensee shall file an Annual Report with the Board not later than March 31<sup>st</sup> of the year following the calendar year reported which shall contain the following information:*

**1. Water Usage** (Licensed Water Volume Withdrawal: 250,000 m<sup>3</sup>)

Total volume withdrawn for reporting year: 95837 m<sup>3</sup>

Table 1 – Monthly withdrawal volumes

Month	Volume from main source (m <sup>3</sup> )	Volume from any other source (m <sup>3</sup> )	TOTAL Volume (m <sup>3</sup> )
January	8352		8352
February	7009		7009
March	6870		6870
April	5939		5939
May	8215		8215
June	9524		9524
July	8184		8184
August	7002		7002
September	8244		8244
October	8571		8571
November	8090		8090
December	9837		9837
TOTALS	95837		95837
% Increase from previous year	1.7%		1.7%

Reasons for increase / decrease:

No reasons specifically identified.

General information:

Information regarding any modifications to the water withdrawal procedure or facilities should be included here. If necessary please attach any relevant reports to the end of this document.

## 2. Solid Waste Disposal

Approximate total yearly volume of solid waste deposited: 4380 m<sup>3</sup>

Table 2 – Monthly solid waste disposal volumes

Month	Volume of solid waste deposited (m <sup>3</sup> )
January	372
February	336
March	372
April	360
May	372
June	360
July	372
August	372
September	360
October	372
November	360
December	372
<b>TOTALS</b>	4380
<b>% Increase from previous year</b>	2.7%

*GNWT – MACA has provided a standard formula for estimating the amount of solid waste deposited into a Solid Waste Facility in the absence of a metered Garbage Truck. The following can be used: **Volume per person per day X number of days X population***

*e.g. **0.015 m<sup>3</sup>** X 30 days X 860 people = 387 m<sup>3</sup> of domestic trash deposited into Solid Waste Facility in a 30 day month*

Reasons for increase / decrease: (e.g. an industrial project close to the Town of Norman Wells, or a large influx of people into town for an IORL shutdown)

Population change.

### 3. Sewage Deposited to Primary Sewage Cells

Table 3 – Monthly sewage waste volumes deposited

Month	Volume of sewage waste deposited (m <sup>3</sup> )		
	Pumper Truck	Utilidor	TOTAL
January			8352
February			7009
March			6870
April			5939
May			8215
June			9524
July			8184
August			7002
September			8244
October			8571
November			8090
December			9837
<b>TOTALS</b>			95837
<b>% Increase from previous year</b>			1.7 %

*To calculate monthly sewage waste deposited to the Primary Lagoons on Seepage Lake, please provide the above information if metered information is available. If metered information is not available, please fill in the table using the corresponding TOTAL water volumes from Table 1. This provides estimation only and equals water in/sewage out.*

Has any sludge been removed from the primary sewage cells or from Seepage Lake during this reporting year? If so, what volume of sludge was removed? What testing was completed on the sludge and where it was disposed of? Please provide documentation for testing and GNWT Water Licence Inspector approval of placement.

There was no sludge removed in 2018.

Was there any decanting at Seepage Lake this reporting year? Please provide dates. What was the decant duration and the approximate volume decanted? As this is a Surveillance Network Program (SNP) site, the resulting testing is to be presented as part of the tabular SNP data to be provided as per the Water Licence [Part B(1)(d)].

There was no decanting in 2018.

### 4. Surveillance Network Program Data

Surveillance Network Program (SNP) information is to be submitted in a tabular format and shall indicate date of testing, parameters tested for and any other information requested by the GNWT Water Licence Inspector or the SLWB. [Laboratory results should be summarized. Results tables 4 to 7 have been provided below for your convenience. Note: it is possible to copy/paste from Excel into Word provided the same number of cells are selected in each table].

Table 4 – SNP Station S07L3-002 – (1) Effluent Monitoring Results – sampled at the beginning, and every three (3) days thereafter during periods of decant or, if no decant, sampled in the spring and fall, and analyzed for the parameters listed.

Parameter	Max. Average Concentration	S07L3-002 – (1) Spring	S07L3-002 – (1) Fall	Average Concentration
<b>Sample Collection Date</b>		May 30, 2018	Sept 26, 2018	
<b>Fecal Coliforms</b>	<10 <sup>6</sup> CFU/100 ml	<1	3	2
<b>BOD<sub>5</sub></b>	180 mg/L	8	4	6
<b>Suspended Solids</b>	125 mg/L	8	<3	5.5
<b>pH</b>	Between 6 and 9	8.84	7.59	8.21
<b>Oil and Grease</b>	No visible sheen	No Visible Sheen	No Visible Sheen	
<b>CBOD</b>	N/A	8	5	6.5
<b>Water levels</b>		64.4 m	64.5 m	

Table 5 – SNP Station S07L3-002 – (4) and (5) Groundwater Monitoring Results - sampled semi-annually in the spring and fall and at the request of an Inspector and analyzed for suite of parameters listed.

SNP Stations S07L3-002 – (4) and (5) were installed in 2018, we will start sampling from those sites in 2019.

Table 6 – SNP Station S07L3-002 – (6) and (7) Monitoring Results – sampled semi-annually in the spring and fall and at the request of an Inspector and analyzed for the suite of parameters listed.

Parameter	Storm Drain Effluent		Pumphouse	
	S07L3-002 – (6) Spring	S07L3-002 – (6) Fall	S07L3-002 - (7) Spring	S07L3-002 – (7) Fall
<b>Sample Collection Date</b>	May 30, 2018	Sept 27, 2018	May 30, 2018	Sept 27, 2018
<b>Fecal Coliform</b>	2	1	<1	<1
<b>BOD<sub>5</sub></b>	<2	4	<2	2
<b>Suspended Solids</b>	4	12	<3	<3
<b>pH</b>	7.9	8	7.62	7.26
<b>Calcium</b>	109	140	26.7	22.1
<b>Sodium</b>	13.5	14.1	21.8	9
<b>Conductivity</b>	790	998	316	289
<b>Total Phosphate</b>				
<b>Magnesium</b>	28.9	14.6	7.84	5.9
<b>Sulphate</b>	173	155	59.9	59
<b>Potassium</b>	2.25	2.7	0.927	1.4
<b>Total Arsenic</b>	0.5	0.6	<0.2	<0.2
<b>Total Copper</b>	4.6	1.4	25.3	32.1
<b>Total Lead</b>	<0.1	<0.1	<0.1	<0.1
<b>Total Zinc</b>	20	22.7	3.8	6.4
<b>Total Nickel</b>	9.9	12.4	1	1
<b>Total Mercury</b>	<0.01	<0.01	<0.01	<0.01
<b>Total Chromium</b>	0.1	0.2	<0.1	<0.1
<b>Total Cadmium</b>	<0.04	<0.1	<0.04	<0.04
<b>Total Iron</b>	275	504	19	15
<b>Total Phenols</b>	0.0014	0.0024	<0.001	<0.001
<b>Oil and Grease</b>	Non-visible	Non-visible	Non-visible	Non-visible
<b>Total Organic Carbon</b>				
<b>Nitrate and Nitrogen</b>	0.148		<0.001	
<b>Ammonia Nitrogen</b>	0.148		0.0782	

Table 7 – SNP Station S07L3-002 – (2) and (3) Water Monitoring Results - sampled monthly during periods of flow and analyzed for suite of parameters listed.

Parameter	Seepage Creek – Quarry Road SNP S07L3-002 – (2)						Seepage Creek – Mackenzie Drive SNP S07L3-002 – (3)					
	May	June	July	Aug	Sept		May	June	July	Aug	Sept	
Sample Collection Date	May 30, 2018	June 27, 2018	July 24, 2018	Aug 29, 2018	Sept 26, 2018		May 30, 2018	June 27, 2018	July 24, 2018	Aug 29, 2018	Sept 26, 2018	
Fecal Coliforms (CFU/100 mL)	<1	<1	8	1	1		1	5	13	18	<1	
BOD <sub>5</sub> (mg/L)	<2	<2	2	<2	3		2	<2	2	<2	4	
Suspended Solids (mg/L)	<3	<3	4	<3	8		72	<3	<3	4	<3	
pH	7.54	7.45	7.52	7.69	7.68		8.04	8.12	8.17	8.18	8.20	
Oil and Grease	Non-visible	Non-visible	Non-visible	Non-visible	Non-visible		Non-visible	Non-visible	Non-visible	Non-visible	Non-visible	
CBOD (mg/L)	2	<2	<2	<2	3		2	<2	<2	<2	3	
Calcium(mg/L)	37.9	69.5	58.9	41.8	48.1		43.2	58.1	59	47.5	54.7	
Sodium(mg/L)	6.23	12.6	17.2	15	6.3		11.1	14.2	22.4	27	17.6	
Conductivity	319	534	540	586	456		371	459	550	621	552	
Total Phosphate (mg/L)	0.036	0.072	0.065	0.03	0.019		0.056	0.014	0.065	0.008	0.008	
Magnesium(mg/L)	12.7	18.4	19.7	8.8	5.6		14	16.9	21.7	15	10.9	
Sulphate(mg/L)	51	115	89	123	79		55.1	71	101	117	95	
Potassium(mg/L)	0.901	1.3	1.6	2.1	1.3		0.965	0.9	1.2	3.6	1.8	
Total Arsenic (µg/L)	0.4	0.5	0.5	0.4	0.3		0.6	0.7	0.7	0.4	0.4	
Total Copper (µg/L)	0.2	<0.2	<0.2	0.2	<0.2		0.7	0.4	0.4	0.4	0.3	
Total Lead (µg/L)	<0.1	<0.1	<0.1	<0.1	<0.1		0.2	<0.1	<0.1	<0.1	<0.1	
Total Zinc (µg/L)	<5	<5	<5	<5	<5		<5	<5	<5	<5	<5	
Total Nickel (µg/L)	0.7	0.8	0.8	0.7	0.6		1.4	1	1	0.9	0.8	
Total Mercury(µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.01	
Total Chromium(µg/L)	<0.1	<0.1	<0.1	<0.1	<0.1		0.5	0.1	<0.1	0.1	<0.1	
Total Cadmium(µg/L)	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	
Total Iron(µg/L)	55	77	74	39	28		524	188	138	98	74	
Total Phenols(mg/L)	<0.001	<0.001	0.0039	<0.001	0.0015		<0.001	<0.001	0.0027	<0.001	0.0015	

## **5. SNP Sample Locations**

Please see Appendix B for SNP sample locations.

**6. Problems, modifications or repairs completed during the year on water supply and waste disposal facilities**

A new sewer lift station was built and commissioned in 2018. Please see O&M manual for all as-built drawings and information regarding the new sewer lift station.

**7. Abandonment and restoration**

Include any abandonment and restoration details here including any work anticipated to be completed during the next year. If required please attach any as-built drawings or reports as an appendices to this report.

**8. Unauthorized discharges**

Four unauthorized discharges occurred in 2018. The material spilled consisted of greywater and/or wastewater. The volume of material spilled ranged from 0.01 m<sup>2</sup> to 6 m<sup>2</sup>. Spills were reported to the Northwest Territories Hazardous Materials Spill Line with 24 hours and cleaned up promptly. Please see Appendix A for the complete spill report forms.

**9. Updates or revisions to approved plans**

Details on any changes to approved plans such as the Operation and Maintenance Plan or any other that is specific to this Municipal Water Licence. Please attach documents as appendices to this report.

**10. Studies requested by the Board**

If the Board has requested that specific studies be completed, include details of the plan in this section with a summary of the outcome. Include any attachments with the submission of the Annual Report.

**11. Other Information**

- Include any other information here that may be valuable to the SLWB or to GNWT.
- Include details on upcoming studies that will be completed.
- Please include any non-compliance items identified in the GNWT Water Licence Inspection report and detail how the Town of Norman Wells is addressing them.
- If there is any contaminated soil piles currently in use (land farming), please list the details of containment, remediation and progress in this section.
- Please identify any on-going compliance issues for the Town of Norman Wells. This can facilitate discussions to resolve the issues.



# NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND  
OTHER HAZARDOUS MATERIALS



Canada



NT-NU 24-HOUR SPILL REPORT LINE

Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date:	01	05	18	Report Time:	4:15 pm	<input checked="" type="checkbox"/> Original Spill Report OR <input type="checkbox"/> Update # _____ to the Original Spill Report	Report Number:
	Occurrence Date:	01	05	18	Occurrence Time:	8:00 am		
C	Land Use Permit Number (if applicable):				Water Licence Number (if applicable): S07L3-002			
D	Geographic Place Name or Distance and Direction from the Named Location: Easment between Falcon and Carcajou						Region: <input checked="" type="checkbox"/> NT <input type="checkbox"/> Nunavut <input type="checkbox"/> Adjacent Jurisdiction or Ocean	
E	Latitude: 65 Degrees 16 Minutes 44 Seconds				Longitude: 126 Degrees 49 Minutes 57 Seconds			
F	Responsible Party or Vessel Name: Town Of Norman Wells				Responsible Party Address or Office Location: #3 Mackenzie Drive, Norman Wells, X0E 0V0			
G	Any Contractor Involved: Northridge Contracting				Contractor Address or Office Location: #12 Mackenzie Drive			
H	Product Spilled: <input type="checkbox"/> Potential Spill Wastewater/Grey water				Quantity in Litres, Kilograms or Cubic Metres: 6 cubic meters		U.N. Number:	
I	Spill Source: Sewer Main Cleanouts				Spill Cause: Blockage in sewer		Area of Contamination in Square Metres: 40 square meters	
J	Factors Affecting Spill or Recovery: Cold Temperatures				Describe Any Assistance Required: Vacuum Truck, Steam Truck		Hazards to Persons, Property or Environment: Possible Organic Pathogens	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials: Steam blockage in sewer main using steam truck, vacuum truck used to prevent further sewage overflow during steaming. Soda ash will be applied to neutralize chance of bacterial growth.							
L	Reported to Spill Line by: Hugo Pabke		Position: Utilities Operator		Employer: Town of Norman Wells		Location Calling From: Water Plant	
M	Any Alternate Contact: Greg McDonald		Position: Utilities Operator		Employer: Town of Norman wells		Alternate Contact Location: Water plant	

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:
Lead Agency: <input type="checkbox"/> EC <input type="checkbox"/> CCG/TCMSS <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> AANDC <input type="checkbox"/> NEB <input type="checkbox"/> Other: _____				Significance: <input type="checkbox"/> Minor <input type="checkbox"/> Major <input type="checkbox"/> Unknown	File Status: <input type="checkbox"/> Open <input type="checkbox"/> Closed
Agency:		Contact Name:	Contact Time:	Remarks:	
Lead Agency:					
First Support Agency:					
Second Support Agency:					
Third Support Agency:					

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NT-NU 24-HOUR SPILL REPORT LINE

Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date:	10   23   18	Report Time:	7:00 pm	<input checked="" type="checkbox"/> Original Spill Report OR <input type="checkbox"/> Update # _____ to the Original Spill Report	Report Number:
	B	Occurrence Date:	10   23   18	Occurrence Time:		
C	Land Use Permit Number (if applicable):			Water Licence Number (if applicable):		
D	Geographic Place Name or Distance and Direction from the Named Location: Last Cleanout Before Sewer Lift Station				Region: <input checked="" type="checkbox"/> NT <input type="checkbox"/> Nunavut <input type="checkbox"/> Adjacent Jurisdiction or Ocean	
E	Latitude: _____ Degrees _____ Minutes _____ Seconds			Longitude: _____ Degrees _____ Minutes _____ Seconds		
F	Responsible Party or Vessel Name: Town of Norman Wells		Responsible Party Address or Office Location: 3 Mackenzie Drive, PO Box 5, Norman Wells, NT			
G	Any Contractor Involved: Wildstone		Contractor Address or Office Location: 48 Levich Drive, Whitehorse YT			
H	Product Spilled: <input type="checkbox"/> Potential Spill Greywater / Wastewater		Quantity in Litres, Kilograms or Cubic Metres: 10 Litres		U.N. Number:	
I	Spill Source: Sewage Main		Spill Cause: Power Outage at Sewer Lift Station		Area of Contamination in Square Metres: 1 Square Meter	
J	Factors Affecting Spill or Recovery:		Describe Any Assistance Required:		Hazards to Persons, Property or Environment: Possible Pathogenic Organisms	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials: - Power outage at sewer lift station caused sewer pump not to kick on properly - Small Amount of wastewater dripped out of last cleanout before sewer pumps kicked on - Soda Ash has been applied on the spill site to neutralize any chance of bacterial growth					
L	Reported to Spill Line by: Hugo Pabke	Position: Utility Operator	Employer: Town of Norman Wells	Location Calling From: WTP	Telephone: (867) 688-0669	
M	Any Alternate Contact: Greg McDonald	Position: Utility Operator	Employer: Town of Norman Wells	Alternate Contact Location: WTP	Alternate Telephone: (867) 688-0680	

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:
Lead Agency: <input type="checkbox"/> EC <input type="checkbox"/> CCG/TCMSS <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> AANDC <input type="checkbox"/> NEB <input type="checkbox"/> Other: _____			Significance: <input type="checkbox"/> Minor <input type="checkbox"/> Major <input type="checkbox"/> Unknown		File Status: <input type="checkbox"/> Open <input type="checkbox"/> Closed
Agency:		Contact Name:	Contact Time:	Remarks:	
Lead Agency:					
First Support Agency:					
Second Support Agency:					
Third Support Agency:					



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Canada



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Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date:	11	17	18	Report Time:	12:00 pm	<input checked="" type="checkbox"/> Original Spill Report OR <input type="checkbox"/> Update # _____ to the Original Spill Report	Report Number:
	B	Occurrence Date:	11	16	18	Occurrence Time:		
C	Land Use Permit Number (if applicable):				Water Licence Number (if applicable): S07L3-002			
D	Geographic Place Name or Distance and Direction from the Named Location: Sewer Main just above New Sewage Lift Station						Region: <input checked="" type="checkbox"/> NT <input type="checkbox"/> Nunavut <input type="checkbox"/> Adjacent Jurisdiction or Ocean	
E	Latitude: 65 Degrees   16 Minutes   44 Seconds				Longitude: 126 Degrees   49 Minutes   57 Seconds			
F	Responsible Party or Vessel Name: Town Of Norman Wells				Responsible Party Address or Office Location: #3 Mackenzie Drive, Norman Wells, X0E 0V0			
G	Any Contractor Involved: Northridge Contracting				Contractor Address or Office Location: #12 Mackenzie Drive			
H	Product Spilled: <input type="checkbox"/> Potential Spill Wastewater/Grey water				Quantity in Litres, Kilograms or Cubic Metres: 3 cubic meters		U.N. Number:	
I	Spill Source: Sewer Main Cleanout				Spill Cause: Blockage in sewer		Area of Contamination in Square Metres: 40 square meters	
J	Factors Affecting Spill or Recovery: Cold Temperatures				Describe Any Assistance Required: Vacuum Truck, Steam Truck		Hazards to Persons, Property or Environment: Possible Organic Pathogens	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials: Steam blockage in sewer main using steam truck, vacuum truck used to prevent further sewage overflow during steaming. Soda ash will be applied to neutralize chance of bacterial growth.							
L	Reported to Spill Line by: Greg McDonald		Position: Utilities Operator		Employer: Town of Norman Wells		Location Calling From: Cell Phone	
M	Any Alternate Contact: Hugo Pabke		Position: Utilities Manager		Employer: Town of Norman Wells		Alternate Contact Location: Cell Phone	
								Telephone: (867) 688-0680
								Alternate Telephone: (867) 688-0669

REPORT LINE USE ONLY

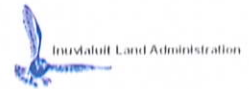
N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:
Lead Agency: <input type="checkbox"/> EC <input type="checkbox"/> CCG/TCMSS <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> AANDC <input type="checkbox"/> NEB <input type="checkbox"/> Other: _____			Significance: <input type="checkbox"/> Minor <input type="checkbox"/> Major <input type="checkbox"/> Unknown		File Status: <input type="checkbox"/> Open <input type="checkbox"/> Closed
Agency:		Contact Name:	Contact Time:	Remarks:	
Lead Agency:					
First Support Agency:					
Second Support Agency:					
Third Support Agency:					

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REPORT LINE USE ONLY

A	Report Date: 12/21/18	Report Time: 2 PM.	<input checked="" type="checkbox"/> Original Spill Report OR <input type="checkbox"/> Update # _____ to the Original Spill Report		Report Number:
B	Occurrence Date: 12/21/18	Occurrence Time: 10:00 AM			
C	Land Use Permit Number (if applicable):	Water Licence Number (if applicable): S18L3-003			
D	Geographic Place Name or Distance and Direction from the Named Location: Norman Wells		Region: <input checked="" type="checkbox"/> NT <input type="checkbox"/> Nunavut <input type="checkbox"/> Adjacent Jurisdiction or Ocean		
E	Latitude: _____ Degrees _____ Minutes _____ Seconds		Longitude: _____ Degrees _____ Minutes _____ Seconds		
F	Responsible Party or Vessel Name: Town of Norman Wells	Responsible Party Address or Office Location: 5 Mackenzie Drive, Norman Wells			
G	Any Contractor Involved: Northridge Contracting	Contractor Address or Office Location: Mackenzie Drive Norman Wells			
H	Product Spilled: <input type="checkbox"/> Potential Spill Grey Water	Quantity in Litres, Kilograms or Cubic Metres: 20 Litres.	U.N. Number:		
I	Spill Source: Wastewater Collection Mainline	Spill Cause: Ice Frozen Pipe	Area of Contamination in Square Metres: 1 Sq Metre.		
J	Factors Affecting Spill or Recovery: Snow, Ice	Describe Any Assistance Required:	Hazards to Persons, Property or Environment: Possible Bacteriological Contamination.		
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials: Vacuum Truck & Steamer used to Thaw & Remove Liquids. Bobcat to Remove solid (Ice + Snow). Soda Ash to Neutralize Bacteriological Condition				
L	Reported to Spill Line by: GREG McDONALD	Position: Utility operator	Employer: Town of Norman Wells	Location Calling From:	Telephone: (867) 507-3700
M	Any Alternate Contact: CHRIS BUIST	Position: Utility operator	Employer: Town of Norman Wells	Alternate Contact Location:	Alternate Telephone:

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:
Lead Agency: <input type="checkbox"/> EC <input type="checkbox"/> CCG/TCMSS <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> AANDC <input type="checkbox"/> NEB <input type="checkbox"/> Other: _____			Significance: <input type="checkbox"/> Minor <input type="checkbox"/> Major <input type="checkbox"/> Unknown		File Status: <input type="checkbox"/> Open <input type="checkbox"/> Closed
Agency:	Contact Name:	Contact Time:	Remarks:		
Lead Agency:					
First Support Agency:					
Second Support Agency:					
Third Support Agency:					







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

**Taiga Batch No.:**  
**180320**

**- FINAL REPORT -**

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**Prepared For:** Town of Norman Wells

**Address:** Box 5  
Norman Wells, NT  
X0E 0V0

**Attn:** Hugo Pabke

**Facsimile:** (867) 587-3724

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

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**Judy Mah**  
**Client Service 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:** Tuesday, June 19, 2018

**Print Date:** Tuesday, June 19, 2018

*Page 1 of 11*



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

**Taiga Batch No.:  
180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(1)**

**Taiga Sample ID: 001**

**Client Project:** SO7L3-002  
**Sample Type:** Sewage  
**Received Date:** 31-May-18  
**Sampling Date:** 30-May-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	8	2	mg/L	31-May-18	SM5210:B	
CBOD	8	2	mg/L	31-May-18	SM5210:B	
<b><u>Inorganics - Physicals</u></b>						
pH	8.84		pH units	31-May-18	SM4500-H:B	
Solids, Total Suspended	12	3	mg/L	05-Jun-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	< 1	1	CFU/100mL	31-May-18	SM9222:D	
<b><u>Organics</u></b>						
Oil and Grease, visible	Non-visible			01-Jun-18	Visual Exam	

**ReportDate:** Tuesday, June 19, 2018  
**Print Date:** Tuesday, June 19, 2018

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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.:**  
**180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(2)

**Taiga Sample ID:** 002

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 31-May-18  
**Sampling Date:** 30-May-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	31-May-18	SM5210:B	
CBOD	2	2	mg/L	31-May-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.028	0.002	mg/L	06-Jun-18	SM4500-P:D	
Phosphorous, Total	0.036	0.002	mg/L	01-Jun-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	105	0.4	mg/L	31-May-18	SM2320:B	
Conductivity, Specific (@25C)	319	0.4	µS/cm	31-May-18	SM2510:B	
pH	7.54		pH units	31-May-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	05-Jun-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	< 1	1	CFU/100mL	31-May-18	SM9222:D	
<b><u>Organics</u></b>						
Hexane Extractable Material	< 2.0	2.0	mg/L	11-Jun-18	EPA1664A	
Oil and Grease, visible	Non-visible			01-Jun-18	Visual Exam	
<b><u>Subcontracted Inorganics</u></b>						
Calcium	37.9	0.05	mg/L	11-Jun-18	EPA200.2	

**ReportDate:** Tuesday, June 19, 2018  
**Print Date:** Tuesday, June 19, 2018

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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.:  
**180320**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(2)

Taiga Sample ID: 002

Magnesium	12.7	0.005	mg/L	11-Jun-18	EPA200.2
Nitrate as Nitrogen	0.0281	0.005	mg/L	06-Jun-18	EPA300.1
Nitrite as N	< 0.0010	0.001	mg/L	06-Jun-18	EPA300.1
NO <sub>2</sub> +NO <sub>3</sub> - N	0.0281	0.0051	mg/L	06-Jun-18	EPA300.1
Potassium	0.901	0.05	mg/L	11-Jun-18	EPA200.2
Sodium	6.23	0.05	mg/L	11-Jun-18	EPA200.2
Sulphate	51.0	0.3	mg/L	06-Jun-18	EPA300.1
<b><u>Subcontracted Organics</u></b>					
Phenols, Total	< 0.0010	0.001	mg/L	12-Jun-18	AB ENV.06537
<b><u>Trace Metals, Total</u></b>					
Arsenic	0.4	0.2	µg/L	06-Jun-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8
Copper	0.2	0.2	µg/L	06-Jun-18	EPA200.8
Iron	55	5	µg/L	06-Jun-18	EPA200.8
Lead	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	06-Jun-18	EPA200.8
Nickel	0.7	0.1	µg/L	06-Jun-18	EPA200.8
Zinc	< 5.0	5	µg/L	06-Jun-18	EPA200.8

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**Taiga Environmental Laboratory**  
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**Taiga Batch No.:**  
**180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(3)

**Taiga Sample ID:** 003

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 31-May-18  
**Sampling Date:** 30-May-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	2	2	mg/L	31-May-18	SM5210:B	
CBOD	2	2	mg/L	31-May-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.002	0.002	mg/L	06-Jun-18	SM4500-P:D	
Phosphorous, Total	0.056	0.002	mg/L	01-Jun-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	129	0.4	mg/L	31-May-18	SM2320:B	
Conductivity, Specific (@25C)	371	0.4	µS/cm	31-May-18	SM2510:B	
pH	8.04		pH units	31-May-18	SM4500-H:B	
Solids, Total Suspended	72	3	mg/L	05-Jun-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	1	1	CFU/100mL	31-May-18	SM9222:D	
<b><u>Organics</u></b>						
Hexane Extractable Material	< 2.0	2.0	mg/L	11-Jun-18	EPA1664A	
Oil and Grease, visible	Non-visible			01-Jun-18	Visual Exam	
<b><u>Subcontracted Inorganics</u></b>						
Calcium	43.2	0.05	mg/L	11-Jun-18	EPA200.2	

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**Taiga Batch No.:**  
**180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(3)**

**Taiga Sample ID: 003**

Magnesium	14.0	0.005	mg/L	11-Jun-18	EPA200.2
Nitrate as Nitrogen	0.0095	0.005	mg/L	06-Jun-18	EPA300.1
Nitrite as N	0.0014	0.001	mg/L	06-Jun-18	EPA300.1
NO <sub>2</sub> +NO <sub>3</sub> - N	0.0110	0.0051	mg/L	06-Jun-18	EPA300.1
Potassium	0.965	0.05	mg/L	11-Jun-18	EPA200.2
Sodium	11.1	0.05	mg/L	11-Jun-18	EPA200.2
Sulphate	55.1	0.3	mg/L	06-Jun-18	EPA300.1

**Subcontracted Organics**

Phenols, Total	< 0.0010	0.001	mg/L	12-Jun-18	AB ENV.06537
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**Trace Metals, Total**

Arsenic	0.6	0.2	µg/L	06-Jun-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8
Chromium	0.5	0.1	µg/L	06-Jun-18	EPA200.8
Copper	0.7	0.2	µg/L	06-Jun-18	EPA200.8
Iron	524	5	µg/L	06-Jun-18	EPA200.8
Lead	0.2	0.1	µg/L	06-Jun-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	06-Jun-18	EPA200.8
Nickel	1.4	0.1	µg/L	06-Jun-18	EPA200.8
Zinc	< 5.0	5	µg/L	06-Jun-18	EPA200.8

**ReportDate:** Tuesday, June 19, 2018

**Print Date:** Tuesday, June 19, 2018

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

**Taiga Batch No.:  
180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(6)**

**Taiga Sample ID: 004**

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 31-May-18  
**Sampling Date:** 30-May-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	31-May-18	SM5210:B	
CBOD	2	2	mg/L	31-May-18	SM5210:B	
Ortho-Phosphate as Phosphorus	< 0.002	0.002	mg/L	06-Jun-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	790	0.4	µS/cm	31-May-18	SM2510:B	
pH	7.96		pH units	31-May-18	SM4500-H:B	
Solids, Total Suspended	4	3	mg/L	05-Jun-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	2	1	CFU/100mL	31-May-18	SM9222:D	
<b><u>Organics</u></b>						
Hexane Extractable Material	< 2.0	2.0	mg/L	11-Jun-18	EPA1664A	
Oil and Grease, visible	Non-visible			01-Jun-18	Visual Exam	
<b><u>Subcontracted Inorganics</u></b>						
Calcium	109	0.05	mg/L	11-Jun-18	EPA200.2	
Magnesium	28.9	0.005	mg/L	11-Jun-18	EPA200.2	
Nitrate as Nitrogen	0.148	0.005	mg/L	06-Jun-18	EPA300.1	

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

**Taiga Batch No.:**  
**180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(6)**

**Taiga Sample ID: 004**

Nitrite as N	< 0.0050	0.005	mg/L	06-Jun-18	EPA300.1	228
NO <sub>2</sub> +NO <sub>3</sub> - N	0.148	0.0051	mg/L	06-Jun-18	EPA300.1	
Potassium	2.25	0.05	mg/L	11-Jun-18	EPA200.2	
Sodium	13.5	0.05	mg/L	11-Jun-18	EPA200.2	
Sulphate	173	0.3	mg/L	06-Jun-18	EPA300.1	
<b><u>Subcontracted Organics</u></b>						
Phenols, Total	0.0014	0.001	mg/L	12-Jun-18	AB ENV.06537	
<b><u>Trace Metals, Total</u></b>						
Arsenic	0.5	0.2	µg/L	06-Jun-18	EPA200.8	
Cadmium	< 0.04	0.04	µg/L	06-Jun-18	EPA200.8	
Chromium	0.1	0.1	µg/L	06-Jun-18	EPA200.8	
Copper	4.6	0.2	µg/L	06-Jun-18	EPA200.8	
Iron	275	5	ug/L	06-Jun-18	EPA200.8	
Lead	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8	
Mercury	< 0.01	0.01	µg/L	06-Jun-18	EPA200.8	
Nickel	9.9	0.1	µg/L	06-Jun-18	EPA200.8	
Zinc	20.0	0.4	µg/L	06-Jun-18	EPA200.8	

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

**Taiga Batch No.:**  
**180320**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(7)

**Taiga Sample ID:** 005

**Client Project:** SO7L3-002

**Sample Type:** Potable

**Received Date:** 31-May-18

**Sampling Date:** 30-May-18

**Sampling Time:** 11:30

**Location:** Norman Wells

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	31-May-18	SM5210:B	
CBOD	< 2	2	mg/L	31-May-18	SM5210:B	
Ortho-Phosphate as Phosphorus	< 0.002	0.002	mg/L	06-Jun-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	316	0.4	µS/cm	31-May-18	SM2510:B	
pH	7.62		pH units	31-May-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	05-Jun-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	< 1	1	CFU/100mL	31-May-18	SM9222:D	
<b><u>Organics</u></b>						
Hexane Extractable Material	< 2.0	2.0	mg/L	11-Jun-18	EPA1664A	
Oil and Grease, visible	Non-visible			01-Jun-18	Visual Exam	
<b><u>Subcontracted Inorganics</u></b>						
Calcium	26.7	0.05	mg/L	11-Jun-18	EPA200.2	
Magnesium	7.84	0.005	mg/L	11-Jun-18	EPA200.2	
Nitrate as Nitrogen	0.0782	0.005	mg/L	06-Jun-18	EPA300.1	

**ReportDate:** Tuesday, June 19, 2018

**Print Date:** Tuesday, June 19, 2018



## Taiga Environmental Laboratory

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

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

Taiga Batch No.:  
**180320**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(7)

Taiga Sample ID: 005

Nitrite as N	< 0.0010	0.001	mg/L	06-Jun-18	EPA300.1
NO <sub>2</sub> +NO <sub>3</sub> - N	0.0782	0.0051	mg/L	06-Jun-18	EPA300.1
Potassium	0.927	0.05	mg/L	11-Jun-18	EPA200.2
Sodium	21.8	0.05	mg/L	11-Jun-18	EPA200.2
Sulphate	59.9	0.3	mg/L	06-Jun-18	EPA300.1

#### Subcontracted Organics

Phenols, Total	< 0.0010	0.001	mg/L	12-Jun-18	AB ENV.06537
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#### Trace Metals, Total

Arsenic	< 0.2	0.2	µg/L	06-Jun-18	EPA200.8
Cadmium	< 0.04	0.04	µg/L	06-Jun-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8
Copper	25.3	0.2	µg/L	06-Jun-18	EPA200.8
Iron	19	5	ug/L	06-Jun-18	EPA200.8
Lead	< 0.1	0.1	µg/L	06-Jun-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	06-Jun-18	EPA200.8
Nickel	1.0	0.1	µg/L	06-Jun-18	EPA200.8
Zinc	3.8	0.4	µg/L	06-Jun-18	EPA200.8

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

**Taiga Batch No.:**  
**180320**

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**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: SO7L3-002-(7)**

**Taiga Sample ID: 005**

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**- DATA QUALIFIERS -**

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*Data Qualifier Descriptions:*

**228**     *Detection Limit Raised - Dilution required due to high Dissolved Solids/Electrical Conductivity.*

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

**Taiga Batch No.:**  
**180459**

**- FINAL REPORT -**

**Prepared For:** Town of Norman Wells

**Address:** Box 5  
Norman Wells, NT  
X0E 0V0

**Attn:** Hugo Pabke

**Facsimile:** (867) 587-3724

**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:** Friday, July 13, 2018

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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.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(1)

**Taiga Sample ID:** 001

**Client Project:** SO7L3-002

**Sample Type:** Sewage

**Received Date:** 28-Jun-18

**Sampling Date:** 27-Jun-18

**Sampling Time:** 11:30

**Location:** Norman Wells

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	3	2	mg/L	29-Jun-18	SM5210:B	
CBOD	< 2	2	mg/L	29-Jun-18	SM5210:B	
<b><u>Inorganics - Physicals</u></b>						
pH	7.41		pH units	28-Jun-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	03-Jul-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	1	1	CFU/100mL	28-Jun-18	SM9222:D	
<b><u>Organics</u></b>						
Oil and Grease, visible	Non-visible			28-Jun-18	Visual Exam	

**ReportDate:** Friday, July 13, 2018

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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.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(2)

**Taiga Sample ID:** 002

**Client Project:** SO7L3-002

**Sample Type:** Freshwater

**Received Date:** 28-Jun-18

**Sampling Date:** 27-Jun-18

**Sampling Time:** 11:30

**Location:** Norman Wells

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	29-Jun-18	SM5210:B	
CBOD	< 2	2	mg/L	29-Jun-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.065	0.002	mg/L	29-Jun-18	SM4500-P:D	
Phosphorous, Total	0.072	0.002	mg/L	06-Jul-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	534	0.4	µS/cm	28-Jun-18	SM2510:B	
pH	7.45		pH units	28-Jun-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	03-Jul-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	69.5	0.1	mg/L	29-Jun-18	SM4110:B	
Magnesium	18.4	0.1	mg/L	29-Jun-18	SM4110:B	
Potassium	1.3	0.1	mg/L	29-Jun-18	SM4110:B	
Sodium	12.6	0.1	mg/L	29-Jun-18	SM4110:B	
Sulphate	115	1	mg/L	29-Jun-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	< 1	1	CFU/100mL	28-Jun-18	SM9222:D	

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

**Taiga Batch No.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: SO7L3-002-(2)**

**Taiga Sample ID: 002**

**Organics**

Hexane Extractable Material	< 2.0	2.0	mg/L	03-Jul-18	EPA1664A
Oil and Grease, visible	Non-visible			28-Jun-18	Visual Exam

**Subcontracted Organics**

Phenols, Total	< 0.0010	0.001	mg/L	04-Jul-18	AB ENV.06537
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**Trace Metals, Total**

Arsenic	0.5	0.2	µg/L	03-Jul-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	03-Jul-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	03-Jul-18	EPA200.8
Copper	< 0.2	0.2	µg/L	03-Jul-18	EPA200.8
Iron	77	5	µg/L	03-Jul-18	EPA200.8
Lead	< 0.1	0.1	µg/L	03-Jul-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	03-Jul-18	EPA200.8
Nickel	0.8	0.1	µg/L	03-Jul-18	EPA200.8
Zinc	< 5.0	5	µg/L	03-Jul-18	EPA200.8

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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.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(3)

**Taiga Sample ID:** 003

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 28-Jun-18  
**Sampling Date:** 27-Jun-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	29-Jun-18	SM5210:B	
CBOD	< 2	2	mg/L	29-Jun-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.003	0.002	mg/L	29-Jun-18	SM4500-P:D	
Phosphorous, Total	0.014	0.002	mg/L	06-Jul-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	459	0.4	µS/cm	28-Jun-18	SM2510:B	
pH	8.12		pH units	28-Jun-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	03-Jul-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	58.1	0.1	mg/L	29-Jun-18	SM4110:B	
Magnesium	16.9	0.1	mg/L	29-Jun-18	SM4110:B	
Potassium	0.9	0.1	mg/L	29-Jun-18	SM4110:B	
Sodium	14.2	0.1	mg/L	29-Jun-18	SM4110:B	
Sulphate	71	1	mg/L	29-Jun-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	5	1	CFU/100mL	28-Jun-18	SM9222:D	

**ReportDate:** Friday, July 13, 2018  
**Print Date:** Friday, July 13, 2018



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

**Taiga Batch No.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(3)**

**Taiga Sample ID: 003**

**Organics**

Hexane Extractable Material	< 2.0	2.0	mg/L	03-Jul-18	EPA1664A
Oil and Grease, visible	Non-visible			28-Jun-18	Visual Exam

**Subcontracted Organics**

Phenols, Total	< 0.0010	0.001	mg/L	04-Jul-18	AB ENV.06537
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**Trace Metals, Total**

Arsenic	0.7	0.2	µg/L	03-Jul-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	03-Jul-18	EPA200.8
Chromium	0.1	0.1	µg/L	03-Jul-18	EPA200.8
Copper	0.4	0.2	µg/L	03-Jul-18	EPA200.8
Iron	188	5	µg/L	03-Jul-18	EPA200.8
Lead	< 0.1	0.1	µg/L	03-Jul-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	03-Jul-18	EPA200.8
Nickel	1.0	0.1	µg/L	03-Jul-18	EPA200.8
Zinc	< 5.0	5	µg/L	03-Jul-18	EPA200.8

**ReportDate:** Friday, July 13, 2018  
**Print Date:** Friday, July 13, 2018

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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.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(7) Distribution**

**Taiga Sample ID: 004**

**Client Project:** SO7L3-002  
**Sample Type:** Potable  
**Received Date:** 28-Jun-18  
**Sampling Date:** 27-Jun-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b>Organics</b>						
Bromodichloromethane	< 0.005	0.005	mg/L	04-Jul-18	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	04-Jul-18	EPA8260B	
Chloroform	0.039	0.005	mg/L	04-Jul-18	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	04-Jul-18	EPA8260B	
Trihalomethanes, Total	0.044	0.005	mg/L	04-Jul-18	EPA8260B	

**ReportDate:** Friday, July 13, 2018  
**Print Date:** Friday, July 13, 2018

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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.:**  
**180459**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(7) Return**

**Taiga Sample ID: 005**

**Client Project:** SO7L3-002

**Sample Type:** Potable

**Received Date:** 28-Jun-18

**Sampling Date:** 27-Jun-18

**Sampling Time:** 11:30

**Location:** Norman Wells

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Organics</u></b>						
Bromodichloromethane	< 0.005	0.005	mg/L	04-Jul-18	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	04-Jul-18	EPA8260B	
Chloroform	0.048	0.005	mg/L	04-Jul-18	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	04-Jul-18	EPA8260B	
Trihalomethanes, Total	0.054	0.005	mg/L	04-Jul-18	EPA8260B	

**ReportDate:** Friday, July 13, 2018

**Print Date:** Friday, July 13, 2018

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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.:**  
**180459**

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**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: SO7L3-002-(7) Return**

**Taiga Sample ID: 005**

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**\* 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

**ReportDate:** Friday, July 13, 2018  
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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.:**  
**180621**

**- FINAL REPORT -**

**Prepared For:** Town of Norman Wells

**Address:** Box 5  
Norman Wells, NT  
X0E 0V0

**Attn:** Hugo Pabke

**Facsimile:** (867) 587-3724

**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:** Monday, August 13, 2018  
**Print Date:** Tuesday, August 14, 2018

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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.:**  
**180621**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(2)

**Taiga Sample ID:** 001

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 25-Jul-18  
**Sampling Date:** 24-Jul-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	2	2	mg/L	26-Jul-18	SM5210:B	
CBOD	< 2	2	mg/L	26-Jul-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.063	0.002	mg/L	27-Jul-18	SM4500-P:D	
Phosphorous, Total	0.065	0.002	mg/L	31-Jul-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	540	0.4	µS/cm	25-Jul-18	SM2510:B	
pH	7.52		pH units	25-Jul-18	SM4500-H:B	
Solids, Total Suspended	4	3	mg/L	26-Jul-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	58.9	0.1	mg/L	26-Jul-18	SM4110:B	
Magnesium	19.7	0.1	mg/L	26-Jul-18	SM4110:B	
Potassium	1.6	0.1	mg/L	26-Jul-18	SM4110:B	
Sodium	17.2	0.1	mg/L	26-Jul-18	SM4110:B	
Sulphate	89	1	mg/L	26-Jul-18	SM4110:B	
<b><u>Microbiology</u></b>						

**ReportDate:** Monday, August 13, 2018  
**Print Date:** Tuesday, August 14, 2018



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

**Taiga Batch No.:**  
**180621**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(2)**

**Taiga Sample ID: 001**

Coliforms, Fecal	8	1	CFU/100mL	25-Jul-18	SM9222:D
<b><u>Organics</u></b>					
Hexane Extractable Material	< 2.0	2.0	mg/L	07-Aug-18	EPA1664A
Oil and Grease, visible	Non-visible			25-Jul-18	Visual Exam
<b><u>Subcontracted Organics</u></b>					
Phenols, Total	0.0039	0.001	mg/L	31-Jul-18	AB ENV.06537
<b><u>Trace Metals, Total</u></b>					
Arsenic	0.5	0.2	µg/L	08-Aug-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	08-Aug-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	08-Aug-18	EPA200.8
Copper	< 0.2	0.2	µg/L	08-Aug-18	EPA200.8
Iron	74	5	µg/L	08-Aug-18	EPA200.8
Lead	< 0.1	0.1	µg/L	08-Aug-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	08-Aug-18	EPA200.8
Nickel	0.8	0.1	µg/L	08-Aug-18	EPA200.8
Zinc	< 5.0	5	µg/L	08-Aug-18	EPA200.8

**ReportDate:** Monday, August 13, 2018  
**Print Date:** Tuesday, August 14, 2018

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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.:**  
**180621**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(3)

**Taiga Sample ID:** 002

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 25-Jul-18  
**Sampling Date:** 24-Jul-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	2	2	mg/L	26-Jul-18	SM5210:B	
CBOD	< 2	2	mg/L	26-Jul-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.003	0.002	mg/L	27-Jul-18	SM4500-P:D	
Phosphorous, Total	0.065	0.002	mg/L	31-Jul-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	550	0.4	µS/cm	25-Jul-18	SM2510:B	
pH	8.17		pH units	25-Jul-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	26-Jul-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	59.0	0.1	mg/L	26-Jul-18	SM4110:B	
Magnesium	21.7	0.1	mg/L	26-Jul-18	SM4110:B	
Potassium	1.2	0.1	mg/L	26-Jul-18	SM4110:B	
Sodium	22.4	0.1	mg/L	26-Jul-18	SM4110:B	
Sulphate	101	1	mg/L	26-Jul-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	13	1	CFU/100mL	25-Jul-18	SM9222:D	

**ReportDate:** Monday, August 13, 2018  
**Print Date:** Tuesday, August 14, 2018

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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.:**  
**180621**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(3)**

**Taiga Sample ID: 002**

**Organics**

Hexane Extractable Material	< 2.0	2.0	mg/L	07-Aug-18	EPA1664A
Oil and Grease, visible	Non-visible			25-Jul-18	Visual Exam

**Subcontracted Organics**

Phenols, Total	0.0027	0.001	mg/L	31-Jul-18	AB ENV.06537
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**Trace Metals, Total**

Arsenic	0.7	0.2	µg/L	08-Aug-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	08-Aug-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	08-Aug-18	EPA200.8
Copper	0.4	0.2	µg/L	08-Aug-18	EPA200.8
Iron	138	5	µg/L	08-Aug-18	EPA200.8
Lead	< 0.1	0.1	µg/L	08-Aug-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	08-Aug-18	EPA200.8
Nickel	1.0	0.1	µg/L	08-Aug-18	EPA200.8
Zinc	< 5.0	5	µg/L	08-Aug-18	EPA200.8

**ReportDate:** Monday, August 13, 2018

**Print Date:** Tuesday, August 14, 2018

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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.:**  
**180621**

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**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: SO7L3-002-(3)**

**Taiga Sample ID: 002**

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**\* 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

**ReportDate:** Monday, August 13, 2018  
**Print Date:** Tuesday, August 14, 2018

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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.:**  
**180839**

**- FINAL REPORT -**

**Prepared For:** Town of Norman Wells

**Address:** Box 5  
Norman Wells, NT  
X0E 0V0

**Attn:** Hugo Pabke

**Facsimile:** (867) 587-3724

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

**Judy Mah**  
**Client Service 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:** Tuesday, October 02, 2018

**Print Date:** Tuesday, October 02, 2018

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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.:  
**180839**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(2)

Taiga Sample ID: 001

Client Project: SO7L3-002

Sample Type: Freshwater

Received Date: 30-Aug-18

Sampling Date: 29-Aug-18

Sampling Time: 11:00

Location: Norman Wells

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	30-Aug-18	SM5210:B	
CBOD	< 2	2	mg/L	30-Aug-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.026	0.002	mg/L	31-Aug-18	SM4500-P:D	
Phosphorous, Total	0.030	0.002	mg/L	07-Sep-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	586	0.4	µS/cm	30-Aug-18	SM2510:B	
pH	7.69		pH units	30-Aug-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	30-Aug-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	41.8	0.1	mg/L	30-Aug-18	SM4110:B	
Magnesium	8.8	0.1	mg/L	30-Aug-18	SM4110:B	
Potassium	2.1	0.1	mg/L	30-Aug-18	SM4110:B	
Sodium	15.0	0.1	mg/L	30-Aug-18	SM4110:B	
Sulphate	123	1	mg/L	30-Aug-18	SM4110:B	
<b><u>Microbiology</u></b>						

ReportDate: Tuesday, October 02, 2018

Print Date: Tuesday, October 02, 2018



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

**Taiga Batch No.:**  
**180839**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(2)**

**Taiga Sample ID: 001**

Coliforms, Fecal	1	1	CFU/100mL	30-Aug-18	SM9222:D
<b><u>Organics</u></b>					
Hexane Extractable Material	< 2.0	2.0	mg/L	05-Sep-18	EPA1664A
Oil and Grease, visible	Non-visible			30-Aug-18	Visual Exam
<b><u>Subcontracted Organics</u></b>					
Phenols, Total	< 0.0010	0.001	mg/L	10-Sep-18	AB ENV.06537
<b><u>Trace Metals, Total</u></b>					
Arsenic	0.4	0.2	µg/L	01-Oct-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	01-Oct-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	01-Oct-18	EPA200.8
Copper	0.2	0.2	µg/L	01-Oct-18	EPA200.8
Iron	39	5	µg/L	01-Oct-18	EPA200.8
Lead	< 0.1	0.1	µg/L	01-Oct-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	01-Oct-18	EPA200.8
Nickel	0.7	0.1	µg/L	01-Oct-18	EPA200.8
Zinc	< 5.0	5	µg/L	01-Oct-18	EPA200.8

**ReportDate:** Tuesday, October 02, 2018

**Print Date:** Tuesday, October 02, 2018

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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.:**  
**180839**

## **- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(3)

**Taiga Sample ID:** 002

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 30-Aug-18  
**Sampling Date:** 29-Aug-18  
**Sampling Time:** 11:00  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	< 2	2	mg/L	30-Aug-18	SM5210:B	
CBOD	< 2	2	mg/L	30-Aug-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.002	0.002	mg/L	31-Aug-18	SM4500-P:D	
Phosphorous, Total	0.008	0.002	mg/L	07-Sep-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	621	0.4	µS/cm	30-Aug-18	SM2510:B	
pH	8.18		pH units	30-Aug-18	SM4500-H:B	
Solids, Total Suspended	4	3	mg/L	30-Aug-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	47.5	0.1	mg/L	30-Aug-18	SM4110:B	
Magnesium	15.0	0.1	mg/L	30-Aug-18	SM4110:B	
Potassium	3.6	0.1	mg/L	30-Aug-18	SM4110:B	
Sodium	27.0	0.1	mg/L	30-Aug-18	SM4110:B	
Sulphate	117	1	mg/L	30-Aug-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	18	1	CFU/100mL	30-Aug-18	SM9222:D	

**ReportDate:** Tuesday, October 02, 2018  
**Print Date:** Tuesday, October 02, 2018



## Taiga Environmental Laboratory

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

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

Taiga Batch No.:  
**180839**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(3)

Taiga Sample ID: 002

#### Organics

Hexane Extractable Material	< 2.0	2.0	mg/L	05-Sep-18	EPA1664A
Oil and Grease, visible	Non-visible			30-Aug-18	Visual Exam

#### Subcontracted Organics

Phenols, Total	< 0.0010	0.001	mg/L	10-Sep-18	AB ENV.06537
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#### Trace Metals, Total

Arsenic	0.4	0.2	µg/L	01-Oct-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	01-Oct-18	EPA200.8
Chromium	0.1	0.1	µg/L	01-Oct-18	EPA200.8
Copper	0.4	0.2	µg/L	01-Oct-18	EPA200.8
Iron	98	5	µg/L	01-Oct-18	EPA200.8
Lead	< 0.1	0.1	µg/L	01-Oct-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	01-Oct-18	EPA200.8
Nickel	0.9	0.1	µg/L	01-Oct-18	EPA200.8
Zinc	< 5.0	5	µg/L	01-Oct-18	EPA200.8

ReportDate: Tuesday, October 02, 2018

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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.:  
180839**

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**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: SO7L3-002-(3)**

**Taiga Sample ID: 002**

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

**Taiga Batch No.:**  
**181054**

**- FINAL REPORT -**

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**Prepared For:** Town of Norman Wells

**Address:** Box 5  
Norman Wells, NT  
X0E 0V0

**Attn:** Hugo Pabke

**Facsimile:** (867) 587-3724

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

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**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.

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

**Taiga Batch No.:**  
**181054**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** SO7L3-002-(1)

**Taiga Sample ID:** 001

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 27-Sep-18  
**Sampling Date:** 26-Sep-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	4	2	mg/L	27-Sep-18	SM5210:B	
CBOD	5	2	mg/L	27-Sep-18	SM5210:B	
<b><u>Inorganics - Physicals</u></b>						
pH	7.59		pH units	27-Sep-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	01-Oct-18	SM2540:D	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	3	1	CFU/100mL	27-Sep-18	SM9222:D	
<b><u>Organics</u></b>						
Hexane Extractable Material	< 2.0	2.0	mg/L	09-Oct-18	EPA1664A	
Oil and Grease, visible	Non-visible			28-Sep-18	Visual Exam	

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

**Taiga Batch No.:  
181054**

## **- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(2)**

**Taiga Sample ID: 002**

**Client Project:** SO7L3-002  
**Sample Type:** Freshwater  
**Received Date:** 27-Sep-18  
**Sampling Date:** 26-Sep-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

<b>Test Parameter</b>	<b>Result</b>	<b>Detection Limit</b>	<b>Units</b>	<b>Analysis Date</b>	<b>Analytical Method *</b>	<b>Qualifer</b>
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	3	2	mg/L	27-Sep-18	SM5210:B	
CBOD	3	2	mg/L	27-Sep-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.012	0.002	mg/L	28-Sep-18	SM4500-P:D	
Phosphorous, Total	0.019	0.002	mg/L	03-Oct-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	456	0.4	µS/cm	27-Sep-18	SM2510:B	
pH	7.68		pH units	27-Sep-18	SM4500-H:B	
Solids, Total Suspended	8	3	mg/L	01-Oct-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	48.1	0.1	mg/L	27-Sep-18	SM4110:B	
Magnesium	5.6	0.1	mg/L	27-Sep-18	SM4110:B	
Potassium	1.3	0.1	mg/L	27-Sep-18	SM4110:B	
Sodium	6.3	0.1	mg/L	27-Sep-18	SM4110:B	
Sulphate	79	1	mg/L	27-Sep-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	1	1	CFU/100mL	27-Sep-18	SM9222:D	

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## Taiga Environmental Laboratory

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

Taiga Batch No.:  
**181054**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(2)

Taiga Sample ID: 002

#### Organics

Hexane Extractable Material	< 2.0	2.0	mg/L	09-Oct-18	EPA1664A
Oil and Grease, visible	Non-visible			28-Sep-18	Visual Exam

#### Subcontracted Organics

Phenols, Total	0.0015	0.001	mg/L	05-Oct-18	AB ENV.06537
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#### Trace Metals, Total

Arsenic	0.3	0.2	µg/L	15-Oct-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Copper	< 0.2	0.2	µg/L	15-Oct-18	EPA200.8
Iron	28	5	µg/L	15-Oct-18	EPA200.8
Lead	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	15-Oct-18	EPA200.8
Nickel	0.6	0.1	µg/L	15-Oct-18	EPA200.8
Zinc	< 5.0	5	µg/L	15-Oct-18	EPA200.8

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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.:  
**181054**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(3)

Taiga Sample ID: 003

Client Project: SO7L3-002

Sample Type: Freshwater

Received Date: 27-Sep-18

Sampling Date: 26-Sep-18

Sampling Time: 11:30

Location: Norman Wells

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	4	2	mg/L	27-Sep-18	SM5210:B	
CBOD	3	2	mg/L	27-Sep-18	SM5210:B	
Ortho-Phosphate as Phosphorus	< 0.002	0.002	mg/L	28-Sep-18	SM4500-P:D	
Phosphorous, Total	0.008	0.002	mg/L	03-Oct-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	552	0.4	µS/cm	27-Sep-18	SM2510:B	
pH	8.20		pH units	27-Sep-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	01-Oct-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	54.7	0.1	mg/L	27-Sep-18	SM4110:B	
Magnesium	10.9	0.1	mg/L	27-Sep-18	SM4110:B	
Potassium	1.8	0.1	mg/L	27-Sep-18	SM4110:B	
Sodium	17.6	0.1	mg/L	27-Sep-18	SM4110:B	
Sulphate	95	1	mg/L	27-Sep-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	< 1	1	CFU/100mL	27-Sep-18	SM9222:D	

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**Taiga Environmental Laboratory**  
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**Taiga Batch No.:  
181054**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(3)**

**Taiga Sample ID: 003**

**Organics**

Hexane Extractable Material	< 2.0	2.0	mg/L	10-Oct-18	EPA1664A
Oil and Grease, visible	Non-visible			28-Sep-18	Visual Exam

**Subcontracted Organics**

Phenols, Total	0.0015	0.001	mg/L	05-Oct-18	AB ENV.06537
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**Trace Metals, Total**

Arsenic	0.4	0.2	µg/L	15-Oct-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Copper	0.3	0.2	µg/L	15-Oct-18	EPA200.8
Iron	74	5	µg/L	15-Oct-18	EPA200.8
Lead	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	15-Oct-18	EPA200.8
Nickel	0.8	0.1	µg/L	15-Oct-18	EPA200.8
Zinc	< 5.0	5	µg/L	15-Oct-18	EPA200.8

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## Taiga Environmental Laboratory

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Taiga Batch No.:  
**181054**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(6)

Taiga Sample ID: 004

Client Project: SO7L3-002

Sample Type: Freshwater

Received Date: 27-Sep-18

Sampling Date: 26-Sep-18

Sampling Time: 11:30

Location: Norman Wells

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	4	2	mg/L	27-Sep-18	SM5210:B	
CBOD	3	2	mg/L	27-Sep-18	SM5210:B	
Ortho-Phosphate as Phosphorus	0.003	0.002	mg/L	28-Sep-18	SM4500-P:D	
Phosphorous, Total	0.018	0.002	mg/L	03-Oct-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	998	0.4	µS/cm	27-Sep-18	SM2510:B	
pH	8.00		pH units	27-Sep-18	SM4500-H:B	
Solids, Total Suspended	12	3	mg/L	01-Oct-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	140	0.1	mg/L	27-Sep-18	SM4110:B	
Magnesium	14.6	0.1	mg/L	27-Sep-18	SM4110:B	
Potassium	2.7	0.1	mg/L	27-Sep-18	SM4110:B	
Sodium	14.1	0.1	mg/L	27-Sep-18	SM4110:B	
Sulphate	155	1	mg/L	27-Sep-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	1	1	CFU/100mL	27-Sep-18	SM9222:D	

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**Taiga Environmental Laboratory**  
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**Taiga Batch No.:**  
**181054**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(6)**

**Taiga Sample ID: 004**

**Organics**

Hexane Extractable Material	< 2.0	2.0	mg/L	10-Oct-18	EPA1664A
Oil and Grease, visible	Non-visible			28-Sep-18	Visual Exam

**Subcontracted Organics**

Phenols, Total	0.0024	0.001	mg/L	05-Oct-18	AB ENV.06537
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**Trace Metals, Total**

Arsenic	0.6	0.2	µg/L	15-Oct-18	EPA200.8
Cadmium	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Chromium	0.2	0.1	µg/L	15-Oct-18	EPA200.8
Copper	1.4	0.2	µg/L	15-Oct-18	EPA200.8
Iron	504	5	µg/L	15-Oct-18	EPA200.8
Lead	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	15-Oct-18	EPA200.8
Nickel	12.4	0.1	µg/L	15-Oct-18	EPA200.8
Zinc	22.7	5	µg/L	15-Oct-18	EPA200.8

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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.:  
**181054**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(7)

Taiga Sample ID: 005

Client Project: SO7L3-002

Sample Type: Potable

Received Date: 27-Sep-18

Sampling Date: 26-Sep-18

Sampling Time: 11:30

Location: Norman Wells

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Nutrients</u></b>						
Biochemical Oxygen Demand	2	2	mg/L	27-Sep-18	SM5210:B	
CBOD	2	2	mg/L	27-Sep-18	SM5210:B	
Ortho-Phosphate as Phosphorus	< 0.002	0.002	mg/L	28-Sep-18	SM4500-P:D	
Phosphorous, Total	< 0.002	0.002	mg/L	03-Oct-18	SM4500-P:D	
<b><u>Inorganics - Physicals</u></b>						
Conductivity, Specific (@25C)	289	0.4	µS/cm	27-Sep-18	SM2510:B	
pH	7.26		pH units	27-Sep-18	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	01-Oct-18	SM2540:D	
<b><u>Major Ions</u></b>						
Calcium	22.1	0.1	mg/L	27-Sep-18	SM4110:B	
Magnesium	5.9	0.1	mg/L	27-Sep-18	SM4110:B	
Potassium	1.4	0.1	mg/L	27-Sep-18	SM4110:B	
Sodium	9.0	0.1	mg/L	27-Sep-18	SM4110:B	
Sulphate	59	1	mg/L	27-Sep-18	SM4110:B	
<b><u>Microbiology</u></b>						
Coliforms, Fecal	< 1	1	CFU/100mL	27-Sep-18	SM9222:D	

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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.:  
**181054**

### - CERTIFICATE OF ANALYSIS -

Client Sample ID: SO7L3-002-(7)

Taiga Sample ID: 005

#### Organics

Hexane Extractable Material	< 2.0	2.0	mg/L	10-Oct-18	EPA1664A
Oil and Grease, visible	Non-visible			28-Sep-18	Visual Exam

#### Subcontracted Organics

Phenols, Total	< 0.0010	0.001	mg/L	05-Oct-18	AB ENV.06537
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#### Trace Metals, Total

Arsenic	< 0.2	0.2	µg/L	15-Oct-18	EPA200.8
Cadmium	< 0.04	0.04	µg/L	15-Oct-18	EPA200.8
Chromium	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Copper	32.1	0.2	µg/L	15-Oct-18	EPA200.8
Iron	15	5	ug/L	15-Oct-18	EPA200.8
Lead	< 0.1	0.1	µg/L	15-Oct-18	EPA200.8
Mercury	< 0.01	0.01	µg/L	15-Oct-18	EPA200.8
Nickel	1.0	0.1	µg/L	15-Oct-18	EPA200.8
Zinc	6.4	0.4	µg/L	15-Oct-18	EPA200.8

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

**Taiga Batch No.:  
181054**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(7) Distribution**

**Taiga Sample ID: 006**

**Client Project:** SO7L3-002  
**Sample Type:** Potable  
**Received Date:** 27-Sep-18  
**Sampling Date:** 26-Sep-18  
**Sampling Time:** 11:30  
**Location:** Norman Wells  
**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b>Organics</b>						
Bromodichloromethane	< 0.005	0.005	mg/L	03-Oct-18	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	03-Oct-18	EPA8260B	
Chloroform	0.018	0.005	mg/L	03-Oct-18	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	03-Oct-18	EPA8260B	
Trihalomethanes, Total	0.022	0.005	mg/L	03-Oct-18	EPA8260B	

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**Taiga Environmental Laboratory**  
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**Taiga Batch No.:  
181054**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: SO7L3-002-(7) Return**

**Taiga Sample ID: 007**

**Client Project:** SO7L3-002

**Sample Type:** Potable

**Received Date:** 27-Sep-18

**Sampling Date:** 26-Sep-18

**Sampling Time:** 11:30

**Location:** Norman Wells

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b>Organics</b>						
Bromodichloromethane	< 0.005	0.005	mg/L	03-Oct-18	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	03-Oct-18	EPA8260B	
Chloroform	0.025	0.005	mg/L	03-Oct-18	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	03-Oct-18	EPA8260B	
Trihalomethanes, Total	0.031	0.005	mg/L	03-Oct-18	EPA8260B	

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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.:  
181054**

**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: SO7L3-002-(7) Return**

**Taiga Sample ID: 007**

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**\* 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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