NWB Annual Report **Year being reported:** 2019

License No: 8BC-EUR1621 **Issued Date:** August 11,2016
Expiry Date: August 10, 2021

Project Name: Eureka Weather Station

Licensee: Environment Canada

Mailing Address:
160 Chemin Tour-de-l'isle
Montréal, Qc H3C 4G8
for Eureka Weather Station, Eureka, NU, X0A 0G0

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

Environment and Climate Change Canada

General Background Information on the Project (*optional):

Licence Requirements: the licensee must provide the following information in accordance with

Part B | Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s): Station Creek

Water Quantity:	
10 000	Quantity Allowable Domestic (cu.m)
1 242	Actual Quantity Used Domestic (cu.m)
0	Quantity Allowable Drilling (cu.m)
0	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- ☑ Solid Waste Disposal
- ☑ Sewage
- ☐ Drill Waste
- ☑ Greywater
- ☐ Hazardous
- ☐ Other:

Additional Details:

Appendix A: Quantity of Raw Water
Appendix B: Quality of Raw Water
Appendix C: Quality of Tap (non-drinking) Water
Appendix D: Quantity of Drinking Water Consumed
Appendix E: Quality of Drinking Water Consumed
Appendix F: Quantity of Waste Water Discharged
Appendix G: Quality of Waste Water Discharged
Appendix H: GPS Coordinates
Appendix K: Quality of Surface Water at monitoring stations EUR3 & EUR4

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)

Date of Spill:

Date of Notification to an Inspector:

Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

There are no unauthorized discharges to report.

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed

Additional Details:

Revisions to the Abandonment and Restoration Plan

N/A - not applicable

Additional Details:

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Work Completed in 2019/20

a. The design for water and sewage project is currently being finalized, with tendering in 2020-21
b. The building decommissioning project is currently in design through an environmental consultant with tendering of the project planned for 2021-22
c. Aggregates for the runway project have been stockpiled near the work site.

Work Planned for 2020/21

a. Runway recapitalization project will start during Summer 2020 and will likely last three years.
b. A quarry is currently operated at West Remus Creek for the runway project
c. Program of Works project will be undertaken to recapitalize and address the LCM issues of the Powerhouse, the Ridge Lab (PEARL) and the Main Complex. A terms of reference for this project is currently in development.
d. A project to address LCM issues on the Fuel Farm as well as an asset management plan/building condition report project are also in development.
e. PEARL HVAC Recapitalization project will be rolled into the Program of Works project.
f. Indoor and outdoor lighting will continue to be progressively converted to LED under the Program of Works project
g. Various equipment will be recommissioned under the Program of Works project
h. A study on alternative energies could be conducted
i. ECCC plans to optimize Eureka's energy consumption under the Program of Works project.

Additional Details:

See Appendix H for GPS Co-ordinates of each location where sources of water are utilized

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Details attached

Additional Details:

See Appendix H for GPS Co-ordinates of each location where wastes associated with the licence are deposited.

Results of any additional sampling and/or analysis that was requested by an Inspector

Additional sampling requested by an Inspector or the Board (See below)

Additional Details: (date of request, analysis of results, data attached, etc)

See Appendix K for the results of the additional surface water runoff sample analysis required at the landfill area monitoring station EUR4 .

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

Inspection Report received by the Licensee (Date):

Additional Details: (Dates of Report, Follow-up by the Licensee)

Draft inspection report Iqaluit #1267738-v2-8BC-eur1621 on January 27, 2020
ECCC is currently working on mitigation measures, to be approved by CIRNAC.

Any additional comments or information for the Board to consider

Please note that the production of this report was delayed due to the exceptional circumstances caused by covid-19.

Date Submitted:	May 6, 2020	
Submitted/Prepared by:	Jean-Philippe Cloutier-Dussault	
Contact Information:	**Tel:**	514-283-4045
	Fax:	514-283-3020
	email:	jean-philippe.cloutier-dussault@canada.ca

Quantities of Fresh Water pumped

Eureka 2019

Fresh Water: Station Creek

Fresh Water
Pump: Franklin Electric FLS-400 with a 30’ head approx. 10 gal/minute x 2 pumps
Intake June 12 to September 10 periodic pumping to maintain full
Pump efficiency 80 %
342 hrs x 60 minutes x 20.0 gal = 328,320 gal

Total 1,242 cubic metres

Appendix B
Quality of Raw Water

EUREKA RAW WATER ANALYSIS 2013-2019

Important note: With regards to the timing sampling is conducted, results for raw water quality have always been obtained around March the following year.

Parameter	2013	2014	2015	2016	2017	2018	2019
TDS	3170	2910	**Please refer to 2015 lab results**	2410,0	1430 mg/L	1800 mg/L	Please see footnote
Organic Carbon	4,0	2,0		3,7	2,5 mg/L	3,8 mg/L	
Hardness	1600	155		1180,0	737 mg/L	902 mg/L	
Coliforms, Total	47,3	<1.0		0,0	<1,0 MPN/100ml	<1,0 MPN/100ml	
Escherichia coli	<1.0	<1.0		0,0	<1,0 MPN/100ml	<1,0 MPN/100ml	
Aluminum	0,049	68,5		<0.02	13,8 ug/L	21,7 ug/L	
Antimony	0,0002	0,5		<0.001	0,1 ug/L	0,1 ug/L	
Arsenic	0,0004	0,4		<0.001	0,3 ug/L	0,4 ug/L	
Barium	0,0642	0,0486		0,0501	9,1 ug/L	16,7 ug/L	
Beryllium	<0.0001	<0.0001		<0.001	<0,1 ug/L	<0,1 ug/L	
Boron				0,217			
Cadmium	<0.00005	<0.0001		<0.0002	<0,1 ug/L	0,04 ug/L	
Chromium	0,0001	0,0012		<0.02	0,2 ug/L	0,3 ug/L	
Cobalt	<0.0001	<0.0001		<0.0005	0,7 ug/L	0,1 ug/L	
Copper	0,0164	0,0035		0,002	0,9 ug/L	21,7 ug/L	
Iron	0,032	0,152		<0.1	16 ug/L	35 ug/L	
Lead	0,0002	<0.0001		<0.001	<0,1 ug/L	1,2 ug/L	
Lithium	0,0479	0,0059		0,0464	53,2 ug/L	54,6 ug/L	
Manganese	0,0031	0,0088		0,015	90,9 ug/L	10,2 ug/L	
Molybdenum	0,001	0,0003		0,00062	0,3 ug/L	0,4 ug/L	
Nickel	0,0027	0,0009		0,0052	19,6 ug/L	7,2 ug/L	
Selenium	0,0031	<0.0005		<0.005	1,2 ug/L	0,9 ug/L	
Silver	0,0007	0,0002		<0.001	<0,1 ug/L	<0,1 ug/L	
Strontium	1,38	0,159		1,14	604 ug/L	773 ug/L	
Thallium	<0.0001	<0.0001		<0.005	<0,1 ug/L	<0,1 ug/L	
Titanium	0,0032	0,0014		<0.001	0,3 ug/L	1,0 ug/L	
Uranium	0,0025	0,0002		0,00199	0,8 ug/L	1,1 ug/L	
Vanadium	0,0002	0,0002		<0.002	<0,1 ug/L	0,1 ug/L	
Zinc	0,0092	0,0059		<0.02	< 5,0 ug/L	253 ug/L	
*Bromodicholormethane	N/A*	<0.005		<0.0005	<0.005 mg/L	0.047 mg/L	
*Bromoform	N/A*	<0.005		<0.0005	<0.005 mg/L	0.100 mg/L	
*Dibromochloromethane	N/A*	<0.005		<0.0005	<0.005 mg/L	0.125 mg/L	
*Trihalomethanes	N/A*	<0.005		<0.01	<0.005 mg/L	0.283 mg/L	

*Laboratory equipment / supply failure & unable to repeat measurement

Results for 2019 were unavailable at the time this report was written. They will be provided to NWB as soon as possible in the form of an amendment.

Appendix B
Quality of Raw Water

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Tank Room **Taiga Sample ID:** 003

Client Project:
Sample Type: Water
Received Date: 27-Apr-19
Sampling Date: 27-Apr-19
Sampling Time: 13:32
Location: Eureka Domestic Water
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Total	3.8	0.5	mg/L	03-May-19	SM5310:B	
Inorganics - Physicals						
Solids, Total Dissolved	1800	10	mg/L	01-May-19	SM2540:C	
Turbidity	0.71	0.05	NTU	30-Apr-19	SM2130:B	
Major Ions						
Calcium	199	0.1	mg/L	30-Apr-19	SM4110:B	
Hardness	902	0.7	mg/L	30-Apr-19	SM4110:B	
Magnesium	98.6	0.1	mg/L	30-Apr-19	SM4110:B	
Sodium	217	0.1	mg/L	30-Apr-19	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	28-Apr-19	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	28-Apr-19	SM9223:B	
Organics						
Bromodichloromethane	0.047	0.005	mg/L	09-May-19	EPA8260B	
Bromoform	0.100	0.005	mg/L	09-May-19	EPA8260B	
Chloroform	0.010	0.005	mg/L	09-May-19	EPA8260B	

ReportDate: Friday, May 10, 2019
Print Date: ***Friday, May 10, 2019***

Appendix B
Quality of Raw Water

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Tank Room **Taiga Sample ID:** 003

Dibromochloromethane	0.125	0.005	mg/L	09-May-19	EPA8260B
Trihalomethanes, Total	0.283	0.005	mg/L	09-May-19	EPA8260B
Trace Metals, Total					
Aluminum	21.7	0.6	µg/L	30-Apr-19	EPA200.8
Antimony	0.1	0.1	µg/L	30-Apr-19	EPA200.8
Arsenic	0.4	0.2	µg/L	30-Apr-19	EPA200.8
Barium	16.7	0.1	µg/L	30-Apr-19	EPA200.8
Beryllium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Cadmium	0.04	0.04	µg/L	30-Apr-19	EPA200.8
Cesium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Chromium	0.3	0.1	µg/L	30-Apr-19	EPA200.8
Cobalt	0.1	0.1	µg/L	30-Apr-19	EPA200.8
Copper	21.7	0.2	µg/L	30-Apr-19	EPA200.8
Iron	35	5	ug/L	30-Apr-19	EPA200.8
Lead	1.2	0.1	µg/L	30-Apr-19	EPA200.8
Lithium	54.6	0.2	µg/L	30-Apr-19	EPA200.8
Manganese	10.2	0.1	µg/L	30-Apr-19	EPA200.8
Molybdenum	0.4	0.1	µg/L	30-Apr-19	EPA200.8
Nickel	7.2	0.1	µg/L	30-Apr-19	EPA200.8
Rubidium	3.5	0.1	µg/L	30-Apr-19	EPA200.8
Selenium	0.9	0.3	µg/L	30-Apr-19	EPA200.8
Silver	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Strontium	773	0.1	µg/L	30-Apr-19	EPA200.8
Thallium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Titanium	1.0	0.1	µg/L	30-Apr-19	EPA200.8

ReportDate: Friday, May 10, 2019
Print Date: *Friday, May 10, 2019*

Appendix B
Quality of Raw Water

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Tank Room **Taiga Sample ID:** 003

Uranium	1.1	0.1	µg/L	30-Apr-19	EPA200.8
Vanadium	0.1	0.1	µg/L	30-Apr-19	EPA200.8
Zinc	253	0.4	µg/L	30-Apr-19	EPA200.8

ReportDate: Friday, May 10, 2019
Print Date: *Friday, May 10, 2019*

Appendix C
Quality of Tap Water

EUREKA WATER ANALYSIS 2011-2019: TAP WATER

TAP WATER | **GUIDELINES (mg/l)**

Important note: With regards to the timing sampling is conducted, results for tap water quality have always been obtained around March the following year.

										CANADIAN[i]		US EPA[ii]	
Parameter	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**MAC[ˆ]**	**OG[ˇ]/AO[ˇ]**	**MCL[˜]**	**MCLG[ˇ]**
TDS	1920	1290	**2270**	**936**	**Please refer to 2015 lab results**	**1670**	1190	1940	Please see footnote				
Organic Carbon	2,7	3,3	3,2	4,2		2,86	2,8	5,2					
Hardness	664	15,3	55,3	47,8		11,4	7,1	23,3					
Coliforms, Total	<1.0	<1.0	<1.0	<1.0		0	< 1.0	< 1.0		0/100 ml		100/100ml	0
Escherichia coli	<1.0	<1.0	<1.0	<1.0		0	<1.0	<1.0		0/100 ml			0
Aluminum	0,0291	0,024	0,0035	0,0033		<0.02	2,7	7,6			0,2	0.05-0.2	
Antimony	<0.0001	0,0001	0,0001	0,0001		<0.001	<0.1 ug/L	0.1 ug/L					
Arsenic	0,0003	0,0007	0,0004	0,0004		<0.001	<0.2 ug/L	0.4 ug/L					
Barium	0,0213	0,0004	0,0015	0,0015		0,00061	0,2 ug/L	0.6 ug/L		1		2	2
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	<0.1 ug/L	<0.1 ug/L				0,004	
Boron						0,152				5			
Cadmium	<0.00005	<0.0005	<0.00005	<0.00005		<0.0002	<0.04 ug/L	<0.04 ug/L		0,005		0,005	0,005
Chromium	0,0001	<0.0001	<0.0001	0,0002		<0.002	0,2 ug/L	0,3 ug/L		0,05		0,1	0,1
Cobalt	0,0005	<0.0001	<0.0001	<0.0001		<0.0005	<0.1 ug/L	<0.1 ug/L					
Copper	0,101	0,0447	0,0709	0,104		0,0661	153 ug/L	62,1 ug/L			<1.0		1,3
Iron	0,008	0,023	0,009	0,011		<0.1	38 ug/L	9 ug/L			<0.3	0,3	
Lead	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	0,2 ug/L	<0.1		0,01		0,015	0
Lithium	0,0421	0,0013	0,0026	0,0571		0,0027	3,4 ug/L	5,2 ug/L					
Manganese	0,0188	0,0018	0,0012	0,0008		<0.001	0,3 ug/L	0,6 ug/L			<0.05	0,05	
Molybdenum	0,0003	0,0006	0,0007	0,0007		<0.0005	0,2 ug/L	0,4 ug/L					
Nickel	0,0037	0,0009	0,0003	0,0007		<0.002	0,8 ug/L	0,4 ug/L					
Selenium	0,0018	0,0007	0,0026	0,0029		<0.005	1,0 ug/L	1,1 ug/L					
Silver	<0.0001	0,0005	<0.0001	<0.0001		<0.001	<0.1 ug/L	<0.1 ug/L				0,1	
Strontium	0,363	0,0041	0,003	0,0467		0,0116	4,9 ug/L	23,5 ug/L					
Thallium	<0.0001	<0.0001	<0.0001	<0.0001		<0.005	<0.1 ug/L	<0.1 ug/L					
Titanium	0,0004	0,0032	0,0001	<0.0001		<0.001	<0.1 ug/L	0,2 ug/L					
Uranium	0,0015	0,001	0,0018	0,0021		0,00132	0,3 ug/L	1,1 ug/L					
Vanadium	<0.0001	0,0005	<0.0001	<0.0001		<0.002	<0.1 ug/L	<0.1 ug/L					
Zinc	0,0549	0,009	0,0222	0,0178		<0.02	26,5 ug/L	10,2 ug/L			<5.0	5	
Bromodicholormethane	n/a	<0.005	0,005	<0.005		0,0529	0,068 mg/L	0,055 mg/L		0,016			
Bromoform	n/a	0,036	0,183	0,126		0,11	0,051 mg/L	0,113 mg/L					
Dibromochloromethane	n/a	0,02	0,038	0,026		0,125	0,092 mg/L	0,143 mg/L					
Trihalomethanes	n/a	0,062	0,227	0,155		0,328	0,296 mg/L	0,329 mg/L		0,1		0,08	

*Subcontracted organics are in concentrations less than detectable levels except for those listed immediately above

[i]Guidelines for Canadian Drinking Water Quality Summary Table, May 2008
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/chemical-chimiques-eng.php#tbl6

[ii]US Environmental Protection Agency Drinking Water Standards
http://www.epa.gov/safewater/contaminants/index.html

[ˆ]Maxiumum Acceptable Concentration
[ˇ]Aesthetic Objectives
[ˇ]Operational Guidance Values
[˜]Maximum Contaminant Level
[ˇ]Maximum Contaminant Level Goal

Results for 2019 were unavailable at the time this report was written. They will be provided to NWB as soon as possible in the form of an amendment.

Appendix C
Quality of Tap Water

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Kitchen Tap **Taiga Sample ID:** 002

Client Project:
Sample Type: Water
Received Date: 27-Apr-19
Sampling Date: 27-Apr-19
Sampling Time: 13:37
Location: Eureka Domestic Water
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Total	5.2	0.5	mg/L	03-May-19	SM5310:B	
Inorganics - Physicals						
Solids, Total Dissolved	1940	10	mg/L	01-May-19	SM2540:C	
Turbidity	0.15	0.05	NTU	30-Apr-19	SM2130:B	
Major Ions						
Calcium	5.7	0.1	mg/L	30-Apr-19	SM4110:B	
Hardness	23.3	0.7	mg/L	30-Apr-19	SM4110:B	
Magnesium	2.2	0.1	mg/L	30-Apr-19	SM4110:B	
Sodium	650	0.1	mg/L	30-Apr-19	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	28-Apr-19	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	28-Apr-19	SM9223:B	
Organics						
Bromodichloromethane	0.055	0.005	mg/L	09-May-19	EPA8260B	
Bromoform	0.113	0.005	mg/L	09-May-19	EPA8260B	
Chloroform	0.018	0.005	mg/L	09-May-19	EPA8260B	

ReportDate: Friday, May 10, 2019
Print Date: *Friday, May 10, 2019*

Appendix C
Quality of Tap Water

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Kitchen Tap **Taiga Sample ID:** 002

Dibromochloromethane	0.143	0.005	mg/L	09-May-19	EPA8260B
Trihalomethanes, Total	0.329	0.005	mg/L	09-May-19	EPA8260B
Trace Metals, Total					
Aluminum	7.6	0.6	µg/L	30-Apr-19	EPA200.8
Antimony	0.1	0.1	µg/L	30-Apr-19	EPA200.8
Arsenic	0.4	0.2	µg/L	30-Apr-19	EPA200.8
Barium	0.6	0.1	µg/L	30-Apr-19	EPA200.8
Beryllium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Cadmium	< 0.04	0.04	µg/L	30-Apr-19	EPA200.8
Cesium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Chromium	0.3	0.1	µg/L	30-Apr-19	EPA200.8
Cobalt	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Copper	62.1	0.2	µg/L	30-Apr-19	EPA200.8
Iron	9	5	ug/L	30-Apr-19	EPA200.8
Lead	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Lithium	5.2	0.2	µg/L	30-Apr-19	EPA200.8
Manganese	0.6	0.1	µg/L	30-Apr-19	EPA200.8
Molybdenum	0.4	0.1	µg/L	30-Apr-19	EPA200.8
Nickel	0.4	0.1	µg/L	30-Apr-19	EPA200.8
Rubidium	1.4	0.1	µg/L	30-Apr-19	EPA200.8
Selenium	1.1	0.3	µg/L	30-Apr-19	EPA200.8
Silver	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Strontium	23.5	0.1	µg/L	30-Apr-19	EPA200.8
Thallium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Titanium	0.2	0.1	µg/L	30-Apr-19	EPA200.8

ReportDate: Friday, May 10, 2019
Print Date: *Friday, May 10, 2019*

Appendix C
Quality of Tap Water

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

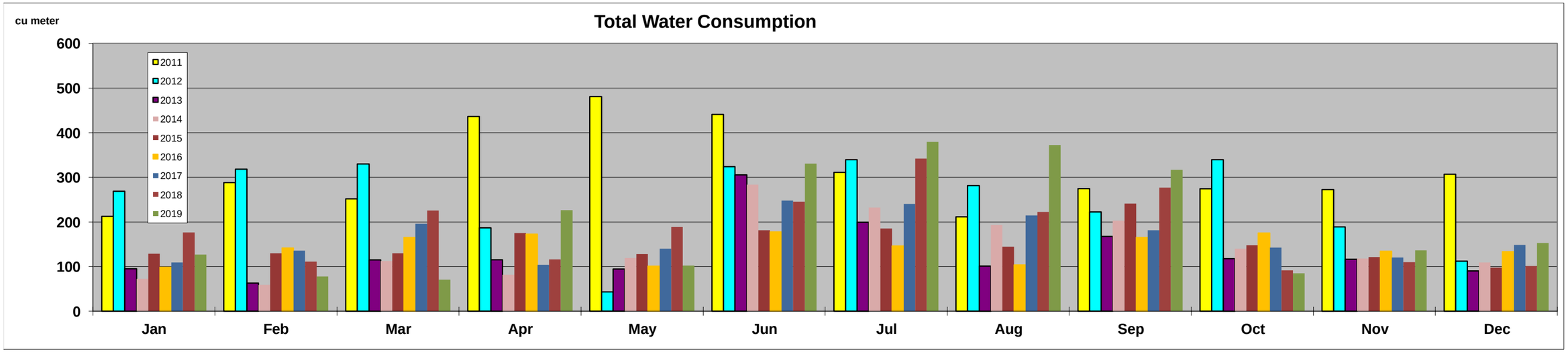
Client Sample ID: Kitchen Tap **Taiga Sample ID:** 002

Uranium	1.1	0.1	µg/L	30-Apr-19	EPA200.8
Vanadium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Zinc	10.2	0.4	µg/L	30-Apr-19	EPA200.8

ReportDate: Friday, May 10, 2019
Print Date: *Friday, May 10, 2019*

APPENDIX D
QUANTITY OF DRINKING WATER

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
57,8	43,8	91,7	104,0	104,9	22,0	131,9	126,9	140,9	162,7	212,5	268,6	95,0	72,4	128,9	98,7	109,6	176,6	127,2	**Jan**
117,5	90,0	60,6	116,7	117,0	137,9	106,3	178,0	194,9	260,0	288,2	318,2	63,1	59,3	130,0	142,1	135,7	111,1	77,9	**Feb**
113,0	79,2	160,6	121,2	188,2	103,5	222,6	271,4	237,7	302,9	251,4	330,1	114,9	112,5	129,7	165,5	196,0	225,7	70,9	**Mar**
84,1	186,8	111,7	160,1	63,7	73,6	209,2	236,3	221,5	237,5	436,6	186,3	115,6	81,7	174,8	172,6	103,6	115,9	226,2	**Apr**
261,8	233,8	280,3	203,7	273,9	322,8	273,8	410,7	328,8	384,5	481,3	43,1	94,6	119,4	128,3	101,2	140,3	189,0	102,2	**May**
335,3	287,9	432,5	418,2	489,0	495,7	325,6	499,7	438,7	413,7	440,6	323,9	305,7	283,4	181,4	177,7	248,0	245,3	330,5	**Jun**
438,0	354,8	369,1	427,6	501,8	379,6	319,3	423,3	357,6	340,4	311,4	339,4	199,5	232,6	185,3	146,5	240,6	341,9	379,5	**Jul**
238,5	160,6	260,3	247,4	236,3	111,3	167,7	163,0	130,0	206,9	211,6	281,2	101,3	193,4	144,7	104,0	214,6	222,6	372,3	**Aug**
114,5	77,1	59,4	180,3	237,8	77,8	153,9	221,1	197,2	202,0	274,9	222,4	167,9	203,3	241,4	165,4	181,4	276,8	316,6	**Sep**
103,1	79,6	165,3	70,8	71,5	107,4	142,6	183,1	275,1	216,5	274,4	339,1	117,4	140,2	147,9	175,5	142,6	91,5	85,0	**Oct**
83,5	94,6	61,5	104,6	71,5	106,4	89,2	103,9	187,0	229,6	272,4	188,8	116,5	118,3	121,5	134,7	120,3	109,8	136,4	**Nov**
141,5	85,5	149,5	144,2	78,1	108,6	163,6	159,9	141,0	195,3	307,0	111,9	90,3	109,3	98,0	133,4	148,7	101,3	152,9	**Dec**
2088,6	1773,7	2202,5	2298,8	2433,7	2046,6	2305,7	2977,3	2850,4	3152,0	3762,3	2953,0	1581,8	1725,8	1811,9	1717,3	1981,4	2207,5	2377,6	**Total (cu M)**
174,1	147,8	183,5	191,6	202,8	170,6	192,1	248,1	237,5	262,7	313,5	246,1	131,8	143,8	151,0	143,1	165,1	184,0	198,1	**Monthly Avg**



Appendix E
Quality of Drinking Water Consumed

EUREKA WATER ANALYSIS 2011-2019 - REVERSE OSMOSIS

Important note: With regards to the timing sampling is conducted, results for reverse osmosis water quality have always been obtained around March the following year.

										GUIDELINES (mg/l)			
										CANADIAN[i]		US EPA[ii]	
Parameter	2011	2012	2013	2014	2015	2016	2017	2018	2019	MAC[iv]	OG[v]/AO[vi]	MCL[vii]	MCLG[viii]
TDS	40	<10	18	83	**Please refer to 2015 lab results**	53	< 10 mg/L	24	Please see footnone				
Organic Carbon	<0.5	<0.5	<0.5	0,7		<0.5	<0.5 mg/L	0.5					
Hardness	3,2	<0.7	0,0027	5,3		<0.54	0,9 mg/L	<0.7					
Coliforms, Total	<1.0	<1.0	<1.0	<1.0		0	<1.0	<1.0		0/100 ml		100/100ml	0
Escherichia coli	<1.0	<1.0	<1.0	<1.0		0	<1.0	<1.0		0/100 ml			0
Aluminum	<0.6	<0.0005	<0.0006	0,0017		<0.02	<0.6 ug/L	<0.6			0,2	0.05-0.2	
Antimony	<0.0001	<0.0001	<0.0001	<0.0001		<0.01	<0.1ug/L	<0.1					
Arsenic	<0.0002	<0.0002	<0.0002	<0.0002		<0.01	<0.2ug/L	<0.2					
Barium	<0.0001	<0.0001	<0.0001	0,0002		<0.0005	<0.1ug/L	<0.1		1		2	2
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001		<0.001	<0.1ug/L	<0.1				0,004	
Boron						0,124				5			
Cadmium	<0.00005	<0.0005	<0.00005	<0.00005		<0.0002	<0.04ug/L	<0.04		0,005		0,005	0,005
Chromium	<0.0001	<0.0001	<0.0001	<0.0001		<0.002	<0.1ug/L	<0.1		0,05		0,1	0,1
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001		<0.0005	<0.1ug/L	<0.1					
Copper	0,0026	0,0072	0,0335	0,0299		0,0272	75.8 ug/L	15,8			<1.0		1,3
Iron	<0.005	<0.005	<0.005	0,006		<0.10	< 5 ug/L	< 5			<0.3	0,3	
Lead	<0.0001	0,0003	0,0003	<0.0001		<0.0010	1.1 ug/L	0,4 ug/l		0,01		0,015	0
Lithium	0,0014	<0.0002	0,0002	0,0093		<0.0020	<0.2ug/L	0,2					
Manganese	<0.0001	<0.0001	<0.0001	0,0004		<0.0010	<0.1ug/L	<0.1			<0.05	0,05	
Molybdenum	<0.0001	0,0001	<0.0001	0,0002		<0.0005	<0.1ug/L	<0.1					
Nickel	0,0002	0,0002	0,0002	0,0005		0,0059	1.2 ug/L	0.2					
Selenium	<0.0003	<0.0005	<0.0003	0,0009		<0.005	<0.3ug/L	<0.3					
Silver	<0.0001	<0.0001	<0.0001	<0.0001		<0.0010	<0.1ug/L	<0.1				0,1	
Strontium	0,0015	0,0001	0,0002	0,0039		<0.0005	<0.1ug/L	<0.1					
Thallium	<0.0001	<0.0001	<0.0001	<0.0001		<0.005	<0.1ug/L	<0.1					
Titanium	<0.0001	<0.0001	<0.0001	<0.0001		<0.0010	<0.1ug/L	<0.1					
Uranium	<0.0001	<0.0001	<0.0001	0,0002		<0.0005	<0.1ug/L	<0.1					
Vanadium	<0.0001	<0.0001	<0.0001	<0.0001		<0.0020	<0.1ug/L	<0.1					
Zinc	0,0175	0,111	0,123	0,0796		0,091	349 ug/L	34,4 ug/l			<5.0	5	
*Bromodicholormethane	n/a	<0.005	0,002	n/a		0,00912	),007 mg/	0,016		0,016			
Bromoform	n/a	<0.005	0,012	n/a		0,00208	:0.005 mg/	0.008					
Dibromochloromethane	n/a	<0.005	0,006	<0.005		0,005	:0.005 mg/	0.024					
Trihalomethanes	n/a	0,012	0,02	<0.005		0,0304	0,023 mg/l	0.057		0,1		0,08	

*Subcontracted organics are in concentrations less than detectable levels except for those listed immediately above

[i] Guidelines for Canadian Drinking Water Quality Summary Table, May 2008
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/chemical-chimiques-eng.php#tbl6

[ii] US Environmental Protection Agency Drinking Water Standards
http://www.epa.gov/safewater/contaminants/index.html

[iv] Maxiumum Acceptable Concentration
[v] Aesthetic Objectives
[vi] Operational Guidance Values
[vii] Maximum Contaminant Level
[viii] Maximum Contaminant Level Goal

Results for 2019 were unavailable at the time this report was written. They will be provided to NWB as soon as possible in the form of an amendment.

Appendix E
Quality of Drinking Water Consumed

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Kitchen Reverse Osmosis **Taiga Sample ID:** 001

Client Project:
Sample Type: Water
Received Date: 27-Apr-19
Sampling Date: 27-Apr-19
Sampling Time: 13:40
Location: Eureka Domestic Water
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Total	0.5	0.5	mg/L	03-May-19	SM5310:B	
Inorganics - Physicals						
Solids, Total Dissolved	24	10	mg/L	01-May-19	SM2540:C	
Turbidity	0.07	0.05	NTU	30-Apr-19	SM2130:B	
Major Ions						
Calcium	0.2	0.1	mg/L	30-Apr-19	SM4110:B	
Hardness	< 0.7	0.7	mg/L	30-Apr-19	SM4110:B	
Magnesium	< 0.1	0.1	mg/L	30-Apr-19	SM4110:B	
Sodium	4.3	0.1	mg/L	30-Apr-19	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	28-Apr-19	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	28-Apr-19	SM9223:B	
Organics						
Bromodichloromethane	0.016	0.005	mg/L	09-May-19	EPA8260B	
Bromoform	0.008	0.005	mg/L	09-May-19	EPA8260B	

ReportDate: Friday, May 10, 2019
Print Date: ***Friday, May 10, 2019***

Appendix E
Quality of Drinking Water Consumed

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Kitchen Reverse Osmosis **Taiga Sample ID:** 001

Chloroform	0.009	0.005	mg/L	09-May-19	EPA8260B
Dibromochloromethane	0.024	0.005	mg/L	09-May-19	EPA8260B
Trihalomethanes, Total	0.057	0.005	mg/L	09-May-19	EPA8260B
Trace Metals, Total					
Aluminum	< 0.6	0.6	µg/L	30-Apr-19	EPA200.8
Antimony	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Arsenic	< 0.2	0.2	µg/L	30-Apr-19	EPA200.8
Barium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Beryllium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Cadmium	< 0.04	0.04	µg/L	30-Apr-19	EPA200.8
Cesium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Chromium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Cobalt	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Copper	15.8	0.2	µg/L	30-Apr-19	EPA200.8
Iron	< 5	5	ug/L	30-Apr-19	EPA200.8
Lead	0.4	0.1	µg/L	30-Apr-19	EPA200.8
Lithium	0.2	0.2	µg/L	30-Apr-19	EPA200.8
Manganese	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Molybdenum	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Nickel	0.2	0.1	µg/L	30-Apr-19	EPA200.8
Rubidium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Selenium	< 0.3	0.3	µg/L	30-Apr-19	EPA200.8
Silver	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Strontium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Thallium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8

ReportDate: Friday, May 10, 2019
Print Date: *Friday, May 10, 2019*

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

Taiga Batch No.: 190219

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Kitchen Reverse Osmosis **Taiga Sample ID:** 001

Titanium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Uranium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Vanadium	< 0.1	0.1	µg/L	30-Apr-19	EPA200.8
Zinc	34.4	0.4	µg/L	30-Apr-19	EPA200.8

Appendix F
Quantity of Waste Water Discharged

QUANTITIES OF WASTE WATER DISCHARGED

Eureka 2019

Waste Water: Sewage Lagoon

Pump: Monarch Pump Model TT30 Type E with attached hose approx. 150 gal/minute

First deacant June 10-11	172,800 gal	654,12 cubic metres
Second decant June 13-14	151,200 gal	572,35 cubic metres
Third decant July 20-21-22	219,600 gal	831,28 cubic metres
Fourth decant July 25-26-27	172,800 gal	654,12 cubic metres
Fifth decant September 2-3	138,600 gal	524,66 cubic metres

Appendix G
Quality of Waste Water Discharged

ANALYSIS OF EUREKA SEWAGE PARAMETERS

Wastewater effluent at Eureka is governed by two guidelines: CCME's Canada-wide Strategy for the Management of Municipal Wastewater Effluent, 2009; and Guidelines for the Discharge of Municipal Wastewater in the Northwest Territories (NWT), 1992. The CCME guidelines address municipal wastewater facilities (owned by municipalities, communities, federal and other government entities, and facilities on federal and aboriginal lands) discharging effluent into surface water, including combined and sanitary sewer overflows. The NWT guidelines are also applicable to the Eureka lagoon. Under Eureka's water licence with the Nunavut Water Board, the NWT guidelines are referenced as the criteria to be used to assess compliance.

The Eureka wastewater lagoon effluent was sampled 2008 through 2019 in order to determine the level of compliance with CCME and NWT guidelines for wastewater. This report discusses the exceeding parameters, their potential causes of exceedances, and identifies corrective solutions if applicable.

Foremost, it should be noted that water samples were taken on July 20, 2019 and results were received from Taiga Laboratory on August 20, 2019. Also, on July 11, 2019, Crown-Indigenous Relations and Northern Affairs Canada conducted a Water Licence inspection in Eureka , which led to report #Iqaluit-1267738-v2-8bc-EUR1621 received in January 2020 by ECCC.

In light of the observations made by the inspector, ECCC is currently working on mitigation measures, which are to be approved by CIRNAC.

In parallel, Environment and Climate Change Canada is undertaking a project to recapitalize the Eureka sewage treatment system. The current system provides partial treatment through decantation, which does not comply with environmental standards and has been assessed as in poor condition. Investment in the recapitalization of the sewage system will contribute to the following results: reducing risks to the environment and human health; provide full compliance with environmental standards regarding the disposal of waste water; provide full rather than partial sewage treatment; provide safe and sanitary disposal of wastewater; minimize environmental impacts from Eureka operations; and, extend the useful life of the asset by 25 years.

The design for the Water and Sewage projects is currently being finalized with tendering to be completed in 2020-21 and construction occurring between 2021-22 and 2023-24.

Effluent exceedances

1. Biochemical Oxygen Demand (BOD)

Effluent iron averaged between 139 to 162 mg/L which is above the Territorial guidelines.
The possible causes of high BOD are[4]:

When BOD levels are high, there is a decline in DO levels. The demand for oxygen by bacteria is high and they are taking oxygen from that which is dissolved in water. If there is no organic waste present in the water, there will be less bacteria present, and BOD will be lower and DO will tend to be higher.

2. Total Suspended Solids (TSS)

Effluent Total Suspended Solids averaged between 133 to 202 mg/L, which is above the Territorial guidelines. The possible causes of high TSS are:

These suspended particles can come from soil erosion, runoff, discharges, stirred bottom sediments or algal blooms. While it is possible for some streams to have naturally high levels of suspended solids, clear water is usually considered an indicator of healthy water. A sudden increase in turbidity in a previously clear body of water is a cause for concern. Excessive suspended sediment can impair water quality for aquatic and human life, impede navigation and increase flooding risks.

Source: https://www.fondriest.com/environmental-measurements/parameters/water-quality/turbidity-total-suspended-solids-water-clarity/

3. PH

Effluent PH averaged between 9,13 to 9,33 pH units, which is above the Territorial guidelines. The possible causes of high PH are:

There are many factors that can affect pH in water, both natural and man-made. Most natural changes occur due to interactions with surrounding rock (particularly carbonate forms) and other materials. pH can also fluctuate with precipitation (especially acid rain) and wastewater or mining discharges. In addition, CO2 concentrations can influence pH levels.

Source: https://www.fondriest.com/environmental-measurements/parameters/water-quality/ph/

4. Iron (Fe)

Effluent iron averaged between 0.859 and 1.13 mg/L which is above the Territorial guidelines.
The possible sources of iron (Fe) are[2]:

a. Natural sources (land, water)
b. Iron sediments or deposits in the lagoon which are being dissolved; and
c. Holding tank prior to evacuation to the lagoon.

Source 1.a noted above concerning natural sources is reinforced by the Franz Environmental report of 2012 entitled "2012 Supplemental Investigation Eureka High Arctic Weather Station, Nunavut" (Included with this Annual Report).
Specifically as follows:

"....Chemical analysis of background surface water samples indicated naturally elevated concentrations of aluminum, cadmium, copper, lead, iron, manganese, and zinc in surface water..."

5. Manganese (Mn)

Effluent Manganese averaged between 0.132 and 0.195 mg/L which is above the Territorial guidelines.

The possible sources of Manganese (Mn) are[5]:

The most common sources of iron and manganese in groundwater are naturally occurring, for example from weathering of iron and manganese bearing minerals and rocks.

Additional Parameters for Analysis

Appendix G
Quality of Waste Water Discharged

Both monitoring stations EUR2 (Landfill Solid Waste Disposal Area) and EUR4 (Landfarm area) ,as per the Nunavut Water Board recommendations, is to be analyzed for the same parameters currently being analyzed for EUR3 (Sewage Lagoon) . Additional sampling for EUR2, EUR,3, and EUR4 is to include analysis for Chloride, Total Hardness, Total Mercury, Total Alkalinity, and Total Organic Carbon. In addition, effluent discharge from EUR 4 is to be analyzed for Benzene, Toluene, and Ethylbenzene, as stated in the Water License Agreement.

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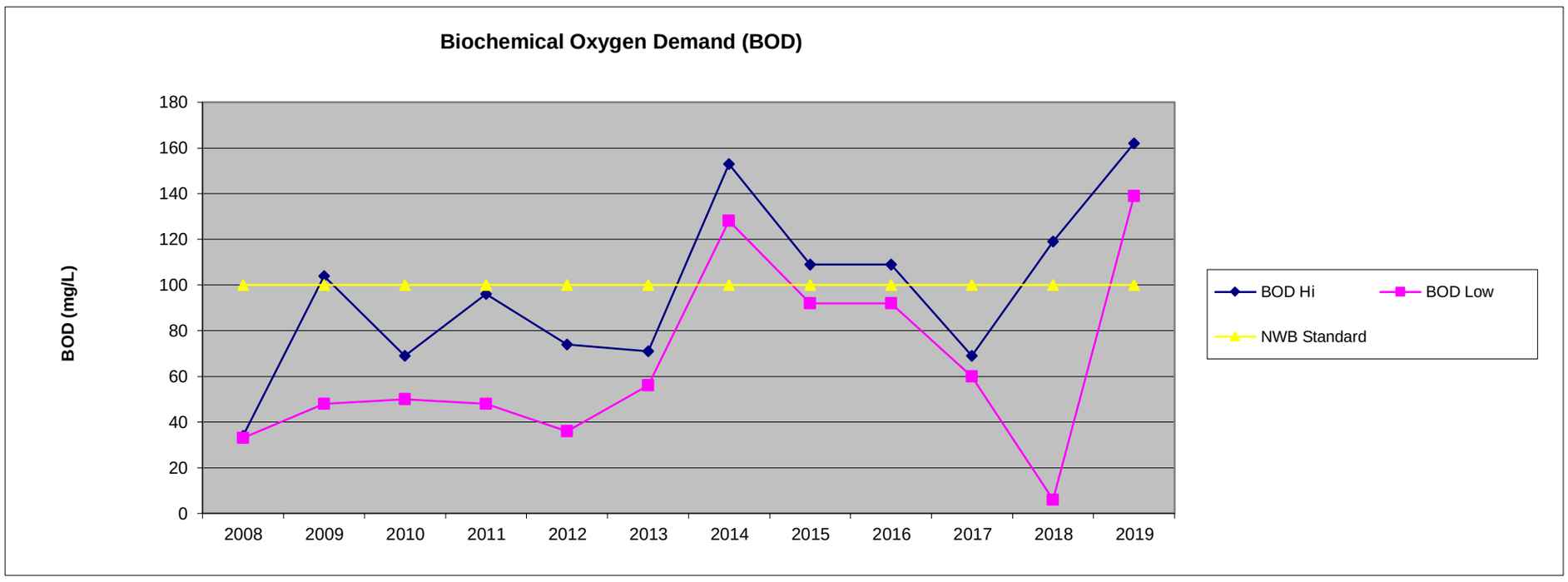
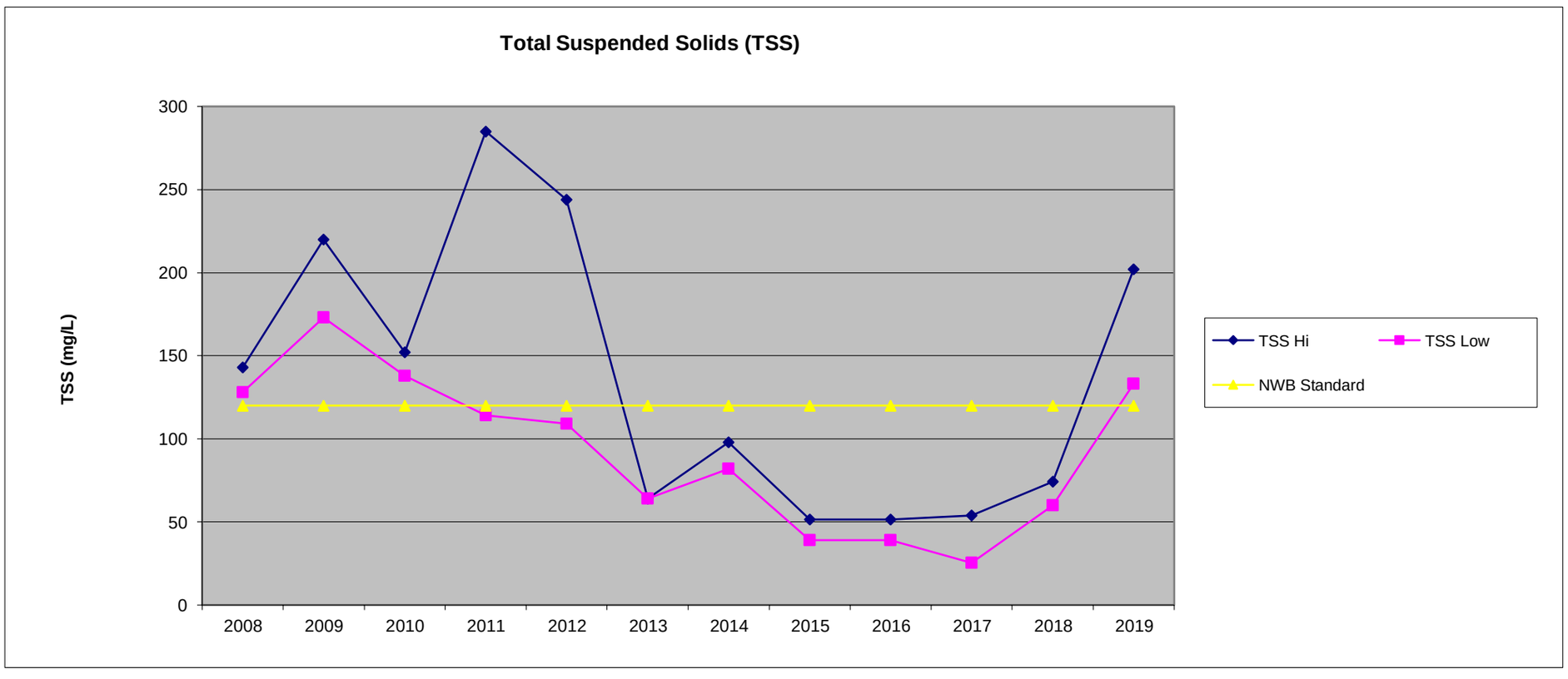
[1]Richard, Michael. Microbiological and Chemical Testing for Troubleshooting lagoons.2003
[2]Tillman, Glenn. Wastewater Treatment: Troubleshooting and Problem Solving.
[3]Connecticut Department of Public Health. Fact Sheet: Manganese in Drinking Water. 2001
[4]Waste Water Treatment Trouble Shooting Guide https://www.bionetix-international.com/resources/troubleshooting.html
[5]Iron and Manganese in Groundwater. Water Stewardship Information Series https://www.rdn.bc.ca/cms/wpattachments/wpID2284atID3808.pdf

Appendix G
Quality of Waste Water Discharged

BOD Results for Eureka Wastewater Lagoon Effluent

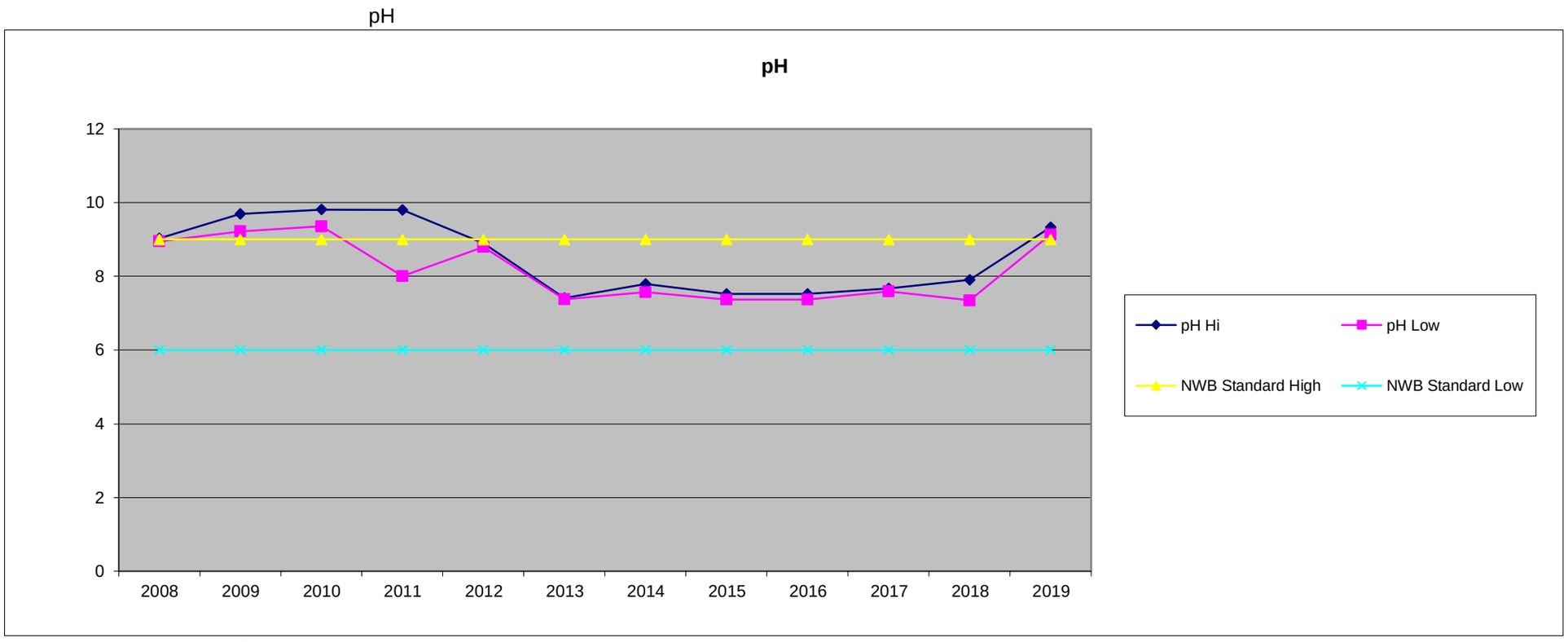


TSS Results for Eureka Wastewater Lagoon Effluent

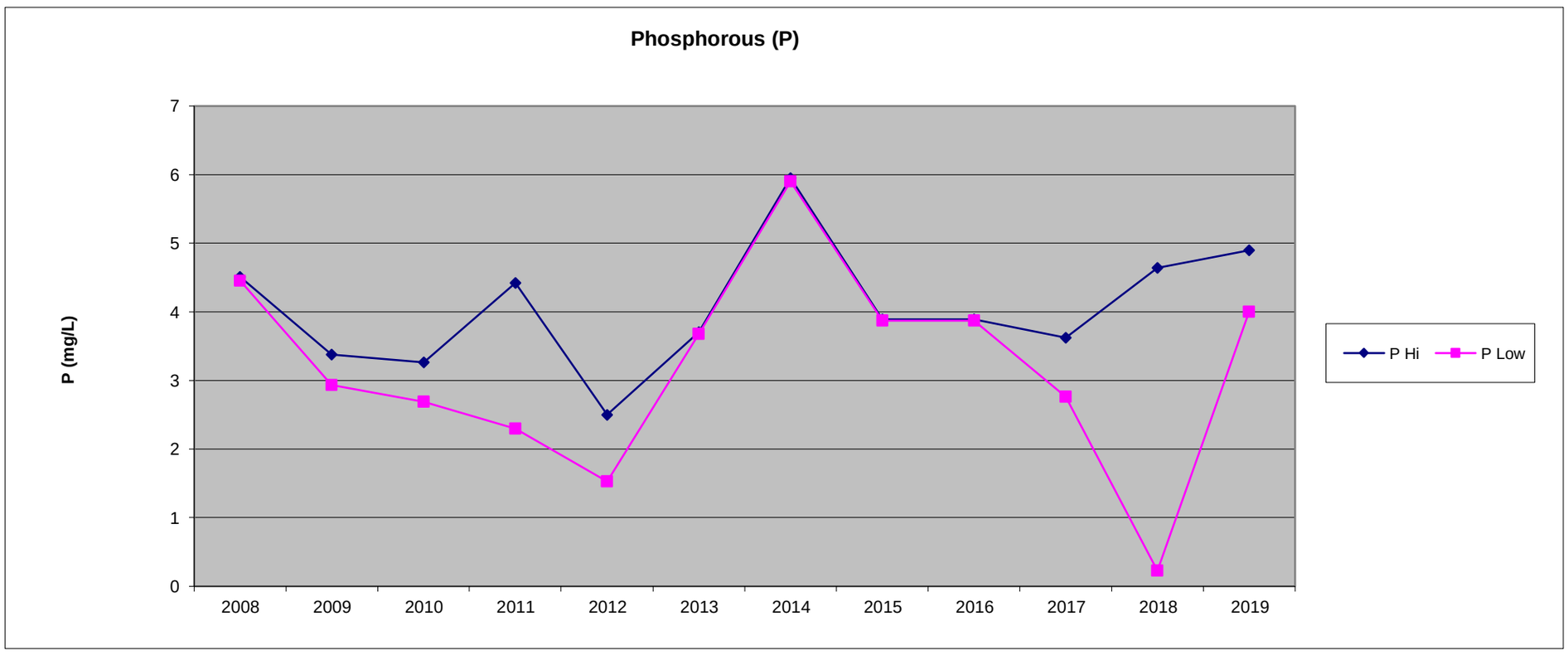


Appendix G
Quality of Waste Water Discharged

pH Results for Eureka Wastewater Lagoon Effluent

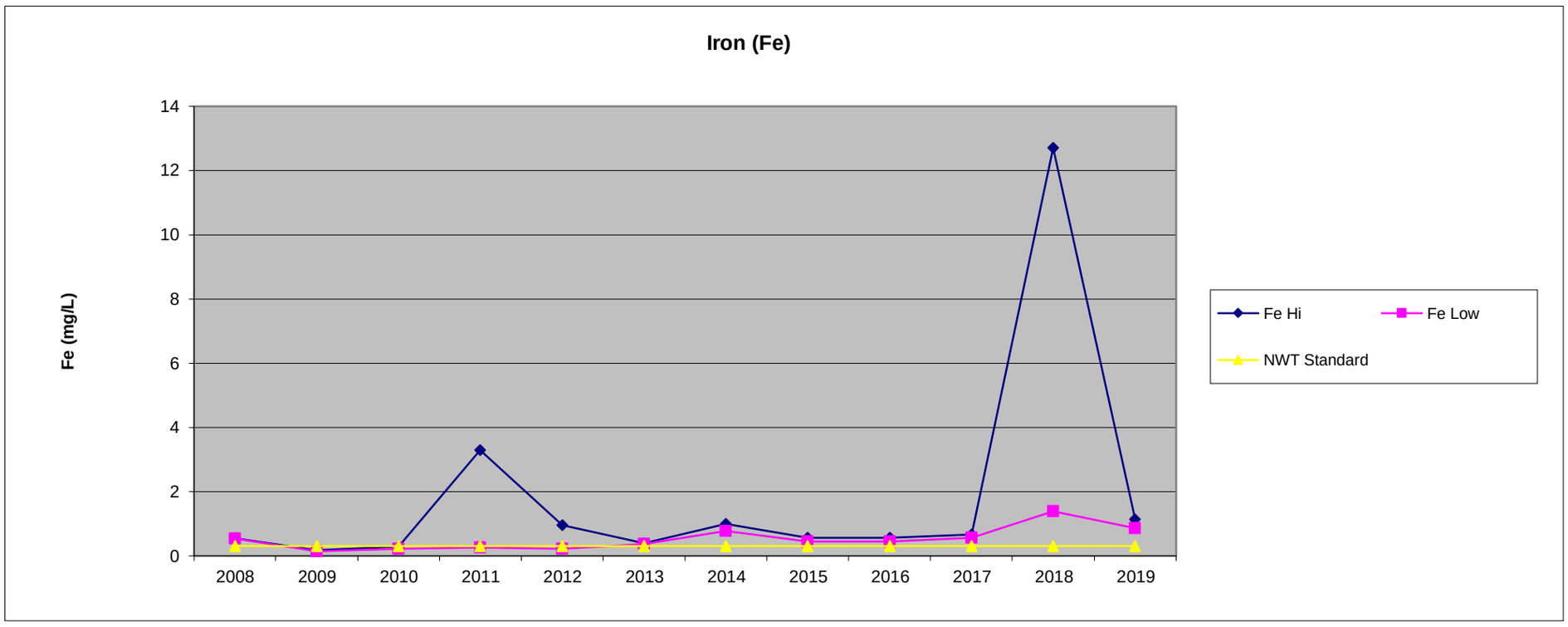


Phosporous Results for Eureka Wastewater Lagoon Effluent

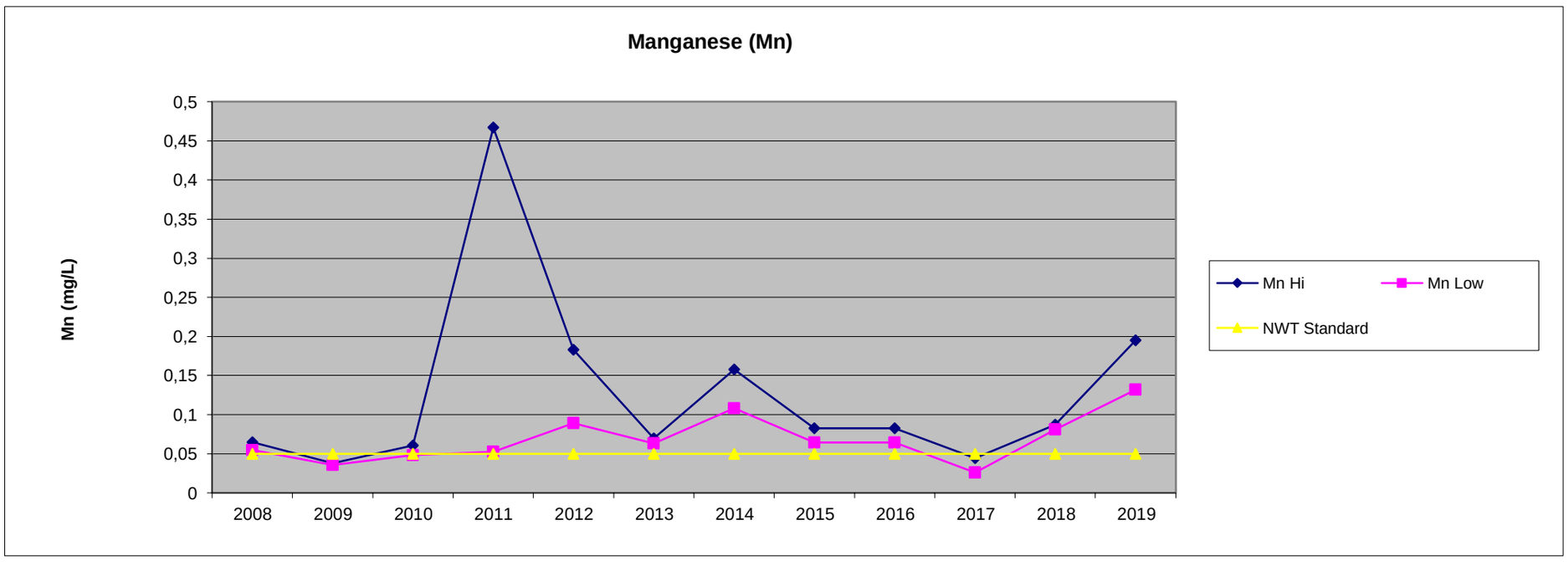


Appendix G
Quality of Waste Water Discharged

Iron Results for Eureka Wastewater Lagoon Effluent



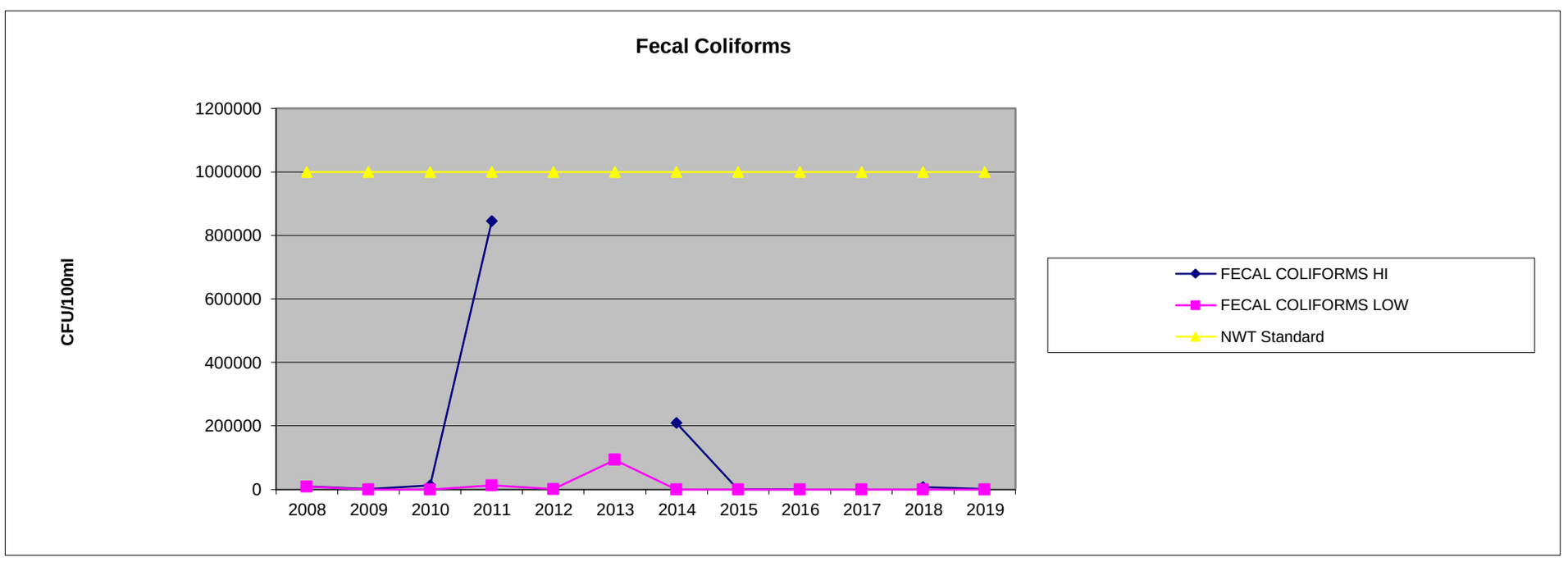
Manganese Results for Eureka Wastewater Lagoon Effluent



Appendix G
Quality of Waste Water Discharged

Fecal Coliform Results for Eureka Wastewater Lagoon Effluent

FECAL COLIFORMS



Note: CFU/100ml = Colony Forming Units/100ml

EUREKA SEWAGE LAGOON: ANALYSIS RESULTS: 2019

Taiga Batch No.:
190560

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

- FINAL REPORT -

Prepared For: Environment Canada

Address: 123 Main Street
Suite 150
Winnipeg,MB
R3C 4W2

Attn: **Don Lavallee** **Facsimile:**

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, August 16, 2019
Print Date: ***Monday, August 19, 2019***

Appendix G
Quality of Waste Water Discharged

Appendix G
Quality of Waste Water Discharged

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

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0720 **Taiga Sample ID:** 001

Client Project:
Sample Type: Wastewater (Sewage Lagoon)
Received Date: 21-Jul-19
Sampling Date: 20-Jul-19
Sampling Time: 18:30
Location: Sewage Lagoon Day 1
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	162	2	mg/L	22-Jul-19	SM5210:B	
Inorganics - Physicals						
Conductivity, Specific (@25C)	6330	0.4	µS/cm	22-Jul-19	SM2510:B	
pH	9.33		pH units	23-Jul-19	SM4500-H:B	
Solids, Total Dissolved	3700	10	mg/L	26-Jun-19	SM2540:C	
Solids, Total Suspended	202	3	mg/L	26-Jun-19	SM2540:D	
Major Ions						
Calcium	101	0.1	mg/L	23-Jul-19	SM4110:B	
Magnesium	58.3	0.1	mg/L	23-Jul-19	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.07	0.01	mg/L	23-Jul-19	SM4110:B	
Potassium	27.7	0.1	mg/L	23-Jul-19	SM4110:B	
Sodium	1160	0.1	mg/L	23-Jul-19	SM4110:B	
Sulphate	381	1	mg/L	23-Jul-19	SM4110:B	
Microbiology						
Coliforms, Fecal	72	2	CFU/100mL	21-Jul-19	SM9222:D	

ReportDate: Friday, August 16, 2019
Print Date: ***Monday, August 19, 2019***

Appendix G
Quality of Waste Water Discharged

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

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0720 **Taiga Sample ID:** 001

Coliforms, Total	1870	10	MPN/100ml	21-Jul-19	SM9223:B	
Organics						
Oil and Grease, visible	Non-visible			21-Jul-19	Visual Exam	
Subcontracted Inorganics						
Phosphorous, Total	4.90	0.10	mg/L	07-Aug-19	APHA4500:P	224
Subcontracted Nutrients						
Ammonia as Nitrogen	2.100	0.050	mg/L	24-Jul-19	SM4500 NH3	
Kjeldahl Nitrogen, Total	20.0	1.0	mg/L	06-Aug-19	APHA4500-NORG (T	224
Subcontracted Organics						
Phenols, Total	0.0416	0.001	mg/L	25-Jul-19	AB ENV.06537	
Trace Metals, Total						
Aluminum	91.5	5	µg/L	01-Aug-19	EPA200.8	
Antimony	0.9	0.1	µg/L	01-Aug-19	EPA200.8	
Arsenic	5.5	0.2	µg/L	01-Aug-19	EPA200.8	
Barium	10.4	0.1	µg/L	01-Aug-19	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8	
Cesium	0.1	0.1	µg/L	01-Aug-19	EPA200.8	
Chromium	0.8	0.1	µg/L	01-Aug-19	EPA200.8	
Cobalt	1.8	0.1	µg/L	01-Aug-19	EPA200.8	
Copper	42.3	0.2	µg/L	01-Aug-19	EPA200.8	
Iron	859	5	µg/L	01-Aug-19	EPA200.8	
Lead	0.6	0.1	µg/L	01-Aug-19	EPA200.8	
Lithium	34.5	0.2	µg/L	01-Aug-19	EPA200.8	
Manganese	132	0.1	µg/L	01-Aug-19	EPA200.8	

ReportDate: Friday, August 16, 2019
Print Date: *Monday, August 19, 2019*

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

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0720 **Taiga Sample ID:** 001

Molybdenum	0.7	0.1	µg/L	01-Aug-19	EPA200.8
Nickel	11.8	0.1	µg/L	01-Aug-19	EPA200.8
Rubidium	17.1	0.1	µg/L	01-Aug-19	EPA200.8
Selenium	0.7	0.5	µg/L	01-Aug-19	EPA200.8
Silver	0.3	0.1	µg/L	01-Aug-19	EPA200.8
Strontium	487	0.1	µg/L	01-Aug-19	EPA200.8
Thallium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8
Titanium	2.2	0.1	µg/L	01-Aug-19	EPA200.8
Uranium	0.5	0.1	µg/L	01-Aug-19	EPA200.8
Vanadium	1.3	0.1	µg/L	01-Aug-19	EPA200.8
Zinc	37.5	5	µg/L	01-Aug-19	EPA200.8

ReportDate: Friday, August 16, 2019
Print Date: *Monday, August 19, 2019*

Appendix G
Quality of Waste Water Discharged

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

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0721 **Taiga Sample ID:** 002

Client Project:
Sample Type: Wastewater (Sewage Lagoon)
Received Date: 21-Jul-19
Sampling Date: 21-Jul-19
Sampling Time: 8:00
Location: Sewage Lagoon Day 1
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand	139	2	mg/L	22-Jul-19	SM5210:B	
Inorganics - Physicals						
Conductivity, Specific (@25C)	6750	0.4	µS/cm	22-Jul-19	SM2510:B	
pH	9.13		pH units	23-Jul-19	SM4500-H:B	
Solids, Total Dissolved	3990	10	mg/L	26-Jun-19	SM2540:C	
Solids, Total Suspended	133	3	mg/L	26-Jun-19	SM2540:D	
Major Ions						
Calcium	123	0.1	mg/L	23-Jul-19	SM4110:B	
Magnesium	65.5	0.1	mg/L	23-Jul-19	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.07	0.01	mg/L	23-Jul-19	SM4110:B	
Potassium	29.3	0.1	mg/L	23-Jul-19	SM4110:B	
Sodium	1220	0.1	mg/L	23-Jul-19	SM4110:B	
Sulphate	380	1	mg/L	23-Jul-19	SM4110:B	
Microbiology						
Coliforms, Fecal	1510	10	CFU/100mL	21-Jul-19	SM9222:D	
Coliforms, Total	34500	100	MPN/100ml	21-Jul-19	SM9223:B	

ReportDate: Friday, August 16, 2019
Print Date: ***Monday, August 19, 2019***

Appendix G
Quality of Waste Water Discharged

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

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0721 **Taiga Sample ID:** 002

Organics						
Oil and Grease, visible	Non-visible			21-Jul-19	Visual Exam	
Subcontracted Inorganics						
Phosphorous, Total	4.00	0.20	mg/L	07-Aug-19	APHA4500:P	224
Subcontracted Nutrients						
Ammonia as Nitrogen	7.450	0.50	mg/L	24-Jul-19	SM4500 NH3	224
Kjeldahl Nitrogen, Total	24.6	1.0	mg/L	06-Aug-19	APHA4500-NORG (T	224
Subcontracted Organics						
Phenols, Total	0.0631	0.001	mg/L	25-Jul-19	AB ENV.06537	
Trace Metals, Total						
Aluminum	100	5	µg/L	01-Aug-19	EPA200.8	
Antimony	0.9	0.1	µg/L	01-Aug-19	EPA200.8	
Arsenic	5.2	0.2	µg/L	01-Aug-19	EPA200.8	
Barium	11.6	0.1	µg/L	01-Aug-19	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8	
Cesium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8	
Chromium	0.9	0.1	µg/L	01-Aug-19	EPA200.8	
Cobalt	1.8	0.1	µg/L	01-Aug-19	EPA200.8	
Copper	40.2	0.2	µg/L	01-Aug-19	EPA200.8	
Iron	1130	5	µg/L	01-Aug-19	EPA200.8	
Lead	0.6	0.1	µg/L	01-Aug-19	EPA200.8	
Lithium	35.9	0.2	µg/L	01-Aug-19	EPA200.8	
Manganese	195	0.1	µg/L	01-Aug-19	EPA200.8	
Molybdenum	0.7	0.1	µg/L	01-Aug-19	EPA200.8	

ReportDate: Friday, August 16, 2019
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0721 **Taiga Sample ID:** 002

Nickel	12.2	0.1	µg/L	01-Aug-19	EPA200.8
Rubidium	16.9	0.1	µg/L	01-Aug-19	EPA200.8
Selenium	0.6	0.5	µg/L	01-Aug-19	EPA200.8
Silver	0.1	0.1	µg/L	01-Aug-19	EPA200.8
Strontium	504	0.1	µg/L	01-Aug-19	EPA200.8
Thallium	< 0.1	0.1	µg/L	01-Aug-19	EPA200.8
Titanium	2.7	0.1	µg/L	01-Aug-19	EPA200.8
Uranium	0.5	0.1	µg/L	01-Aug-19	EPA200.8
Vanadium	1.3	0.1	µg/L	01-Aug-19	EPA200.8
Zinc	36.4	5	µg/L	01-Aug-19	EPA200.8

ReportDate: Friday, August 16, 2019
Print Date: *Monday, August 19, 2019*

Appendix G
Quality of Waste Water Discharged

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

Taiga Batch No.: 190560

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU WW 0721 **Taiga Sample ID:** 002

- DATA QUALIFERS -

Data Qualifier Descriptions:

224 *Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*

*** 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

Appendix H
GPS Coordinates

GPS Coordinates for water sources utilized

Source Description	Latitude			Longitude		
	Deg °	Min '	Sec "	Deg °	Min '	Sec "
Station Creek	79	59	21	85	57	4
Water Lagoon	79	59	20	85	56	46

GPS Locations of areas of waste disposal

Location Description (type)	Latitude			Longitude		
	Deg °	Min '	Sec "	Deg °	Min '	Sec "
Sewage Lagoon	79	59	23	85	50	11
East Landfill	79	59	29	85	46	14
Asbestos Landfill	79	59	17	85	46	50
Crushed Barrel Landfill	79	59	38	85	49	38
Ash Landfill	79	59	32	85	47	52
Contaminated Soil Pit	79	59	40	85	49	34
Land Farm	79	59	40	85	56	25
DND Sewage Lagoon	79	59	23	85	50	11

EUREKA WATER ANALYSIS 2016: Landfill EUR3 and Landfarm EUR4

Parameter	SAMPLE ANALYSIS (mg/L)		GUIDELINES (mg/L)
	LANDFILL EUR 2 2016*	LANDFARM EUR 4 2014**	NWB Guidelines for EUR 4
Conductivity (microS/cm)	500	956	
TDS	n/a	594	
PH (PH units)	7,88	7,79	
BOD	n/a	6	
Amonia as Nitrogen	0.035	<0.005	
Nitrate + Nitrite as Nitrogen	0.099	0,03	
Hardness	161	N/A	
Total Organic Carbon	3,78	N/A	
Total Alkalinity	52	N/A	
Calcium	39	74,1	
Chloride	n/a	N/A	
Potassium	5,97	N/A	
Sodium	48.7	70,4	
Sulphate	68.8	247	
Coliforms, Fecal (CFU/100ml)	n/a	<1	
Oil and Grease	<1.0	NV	NV
Aluminum	9750	0,346	
Arsenic	8.04	0,0005	
Cadmium	0.108	<0,0001	
Chromium	21.2	0,0015	
Cobalt	10.3	0,0005	
Copper	23.2	0,0006	
Iron	25500	0,944	
Lead	10.9	0,0005	0,001
Manganese	225	0,305	
Nickel	23.5	0,0016	
Zinc	73.4	0,0062	
Total Mercury	0.030	N/A	
Total Phenols	0.0025	0,0065	0,02
Benzene	Not required	Not required	0,37
Toluene	Not required	Not required	0,002
Ethylbenzene	Not required	Not required	0,09

TNTC Too numerous to count. Unable to repeat analysis at higher dilution. Holding time exceeded
N/A: Parameter analysis not available

* Latest sampling was received by ECCC on July 13, 2016
** Data not available for 2016. Latest data available is from 2014

*Subcontracted organics are in
concentrations less than detectable levels
except for those listed immediately above

[i]Guidelines for Canadian Drinking Water Quality Summary Table, May 2008
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/chemical-chimiques-eng.php#tbl6

[ii]US Environmental Protection Agency Drinking Water Standards
http://www.epa.gov/safewater/contaminants/index.html

[1]Maxiumum Acceptable Concentration

[2]Aesthetic Objectives

[3]Operational Guidance Values

[4]Maximum Contaminant Level

[5]Maximum Contaminant Level Goal

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Site Location: EUREKA, NV

Attention:MATT AITCHISON

ENVIRONMENT CANADA
WINNIPEG, MB
Canada R3C4W2

Report Date: 2016/07/11
Report #: R2213104
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B651848
Received: 2016/06/27, 08:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity in Water by PC Titrator	1	N/A	2016/06/29	WIN SOP-00063	Based on SM-2320B
BTEX/F1 in Water by HS GC/MS	1	N/A	2016/06/29	WINSOP-00054 WINSOP-00055	EPA8260C/CCME PHCCWS
Chloride by Automated Colourimetry (1)	1	N/A	2016/06/28	BBY6SOP-00011	SM 22 4500-Cl- E m
Conductivity in Water by PC Titrator	1	N/A	2016/06/29	WIN SOP-00063	Based on SM-2510B
CCME Hydrocarbons (F2-F4 in water)	1	2016/06/28	2016/06/29	WINSOP-00056	CCME PHC-CWS
Hardness Total (calculated as CaCO3) (1)	1	N/A	2016/06/29	BBY WI-00033	Auto Calc
Mercury (Total) by CVAF (1)	1	2016/07/11	2016/07/11	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	1	2016/06/27	2016/06/29	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total) (1)	1	2016/06/28	2016/06/28	BBY7SOP-00003,	BCLM2005,EPA6020bR2m
Nitrogen (Total) (1)	1	2016/06/30	2016/07/05	BBY6SOP-00016	SM 22 4500-N C m
Ammonia-N (Preserved) (1)	1	N/A	2016/06/28	BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate + Nitrite (N) - Preserved (1)	1	N/A	2016/06/29	BBY6SOP-00010	SM 22 4500-NO3- I m
pH in Water by PC Titrator (2)	1	N/A	2016/06/29	WIN SOP-00063	SM4500 H+B
Phenols (4-AAP) (1)	1	N/A	2016/06/29	BBY6SOP-00008	SM 22 5530 D m
Sulphate by Automated Colourimetry (1)	1	N/A	2016/06/29	BBY6SOP-00017	SM 22 4500-SO42- E m
Carbon (Total Organic) (1, 3)	1	N/A	2016/06/29	BBY6SOP-00003	SM 22 5310 C m
Total Oil and Grease (1)	1	N/A	2016/06/29	BBY8SOP-00004	BCMOE BCLM Sep2011 m
Total Suspended Solids	1	N/A	2016/06/29	WIN SOP-00042	Based on SM2540 D

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Vancouver
(2) The APHA Standard Method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(3) TOC present in the sample should be considered as non-purgeable TOC.

Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Site Location: EUREKA, NV

Attention:MATT AITCHISON
ENVIRONMENT CANADA
WINNIPEG, MB
Canada R3C4W2

Report Date: 2016/07/11
Report #: R2213104
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B651848
Received: 2016/06/27, 08:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Amanda Hung, B.Sc., Project Manager
Email: AHung@maxxam.ca
Phone# (204)772-7276 Ext:2215
==========
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

BTEX/F1-F4 IN WATER (WATER)

Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.15	0.15	8313009
F3 (C16-C34 Hydrocarbons)	mg/L	<0.15	0.15	8313009
F4 (C34-C50 Hydrocarbons)	mg/L	<0.15	0.15	8313009
Volatiles				
Benzene	ug/L	<0.40	0.40	8313308
Toluene	ug/L	<0.40	0.40	8313308
Ethylbenzene	ug/L	<0.40	0.40	8313308
o-Xylene	ug/L	<0.40	0.40	8313308
m & p-Xylene	ug/L	<0.80	0.80	8313308
Xylenes (Total)	ug/L	<0.80	0.80	8313308
Methyl-tert-butylether (MTBE)	ug/L	<4.0	4.0	8313308
F1 (C6-C10) - BTEX	ug/L	<300	300	8313308
F1 (C6-C10)	ug/L	<300	300	8313308
Surrogate Recovery (%)				
4-Bromofluorobenzene (sur.)	%	100		8313308
D4-1,2-Dichloroethane (sur.)	%	113		8313308
D8-TOLUENE (sur.)	%	100		8313308
O-TERPHENYL (sur.)	%	117		8313009
RDL = Reportable Detection Limit				

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Maxxam
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Success Through Science®

Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Misc. Inorganics				
Alkalinity (Total as CaCO3)	mg/L	52.0	0.50	8312886
Conductivity	uS/cm	500	1.0	8312883
Total Organic Carbon (C)	mg/L	3.78	0.50	8314628
pH	pH	7.88		8312874
Bicarbonate (HCO3)	mg/L	63.4	0.50	8312886
Carbonate (CO3)	mg/L	<0.50	0.50	8312886
Hydroxide (OH)	mg/L	<0.50	0.50	8312886
Anions				
Dissolved Sulphate (SO4)	mg/L	68.8	0.50	8315352
Dissolved Chloride (Cl)	mg/L	70	0.50	8313674
Nutrients				
Total Ammonia (N)	mg/L	0.035	0.0050	8313959
Nitrate plus Nitrite (N)	mg/L	0.099	0.020	8315488
Total Nitrogen (N)	mg/L	0.356	0.020	8316497
OIL & GREASE				
Total Oil and grease	mg/L	<1.0	1.0	8314350
Misc. Organics				
Phenols	mg/L	0.0025	0.0010	8314844
Physical Properties				
Total Suspended Solids	mg/L	899	16	8314287
RDL = Reportable Detection Limit				

Maxxam Analytics International Corporation o/a Maxxam Analytics Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

CCME TOTAL METALS IN WATER (WATER)

Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	161	0.50	8311596
Elements				
Total Mercury (Hg)	ug/L	0.030	0.010	8325607
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	9750	3.0	8313471
Total Antimony (Sb)	ug/L	<0.50	0.50	8313471
Total Arsenic (As)	ug/L	8.04	0.10	8313471
Total Barium (Ba)	ug/L	88.4	1.0	8313471
Total Beryllium (Be)	ug/L	0.94	0.10	8313471
Total Bismuth (Bi)	ug/L	<1.0	1.0	8313471
Total Boron (B)	ug/L	203	50	8313471
Total Cadmium (Cd)	ug/L	0.108	0.010	8313471
Total Chromium (Cr)	ug/L	21.2	1.0	8313471
Total Cobalt (Co)	ug/L	10.3	0.50	8313471
Total Copper (Cu)	ug/L	23.2	0.50	8313471
Total Iron (Fe)	ug/L	25500	10	8313471
Total Lead (Pb)	ug/L	10.9	0.20	8313471
Total Lithium (Li)	ug/L	29.8	5.0	8313471
Total Manganese (Mn)	ug/L	225	1.0	8313471
Total Molybdenum (Mo)	ug/L	<1.0	1.0	8313471
Total Nickel (Ni)	ug/L	23.5	1.0	8313471
Total Selenium (Se)	ug/L	0.50	0.10	8313471
Total Silicon (Si)	ug/L	17200	100	8313471
Total Silver (Ag)	ug/L	0.050	0.020	8313471
Total Strontium (Sr)	ug/L	221	1.0	8313471
Total Thallium (Tl)	ug/L	0.126	0.050	8313471
Total Tin (Sn)	ug/L	<5.0	5.0	8313471
Total Titanium (Ti)	ug/L	209	5.0	8313471
Total Uranium (U)	ug/L	1.55	0.10	8313471
Total Vanadium (V)	ug/L	44.2	5.0	8313471
Total Zinc (Zn)	ug/L	73.4	5.0	8313471
Total Zirconium (Zr)	ug/L	3.61	0.50	8313471
Total Calcium (Ca)	mg/L	39.0	0.050	8311599
Total Magnesium (Mg)	mg/L	15.4	0.050	8311599
Total Potassium (K)	mg/L	5.97	0.050	8311599
RDL = Reportable Detection Limit				

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Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

CCME TOTAL METALS IN WATER (WATER)

Maxxam ID		OX5883		
Sampling Date				
	UNITS	EUR-2	RDL	QC Batch
Total Sodium (Na)	mg/L	48.7	0.050	8311599
Total Sulphur (S)	mg/L	24.8	3.0	8311599
RDL = Reportable Detection Limit				

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Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

GENERAL COMMENTS

Sample OX5883-01 : Due to the presence of higher than normal particulate levels, the sample was filtered to prevent interference during analysis for the following: pH, Conductivity and Alkalinity.

Results relate only to the items tested.

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Maxxam Job #: B651848
Report Date: 2016/07/11

QUALITY ASSURANCE REPORT

ENVIRONMENT CANADA
Site Location: EUREKA, NV

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8313009	O-TERPHENYL (sur.)	2016/06/28	106	50 - 130	126	50 - 130	118	%		
8313308	4-Bromofluorobenzene (sur.)	2016/06/29	103	60 - 140	104	60 - 140	100	%		
8313308	D4-1,2-Dichloroethane (sur.)	2016/06/29	111	60 - 140	104	60 - 140	117	%		
8313308	D8-TOLUENE (sur.)	2016/06/29	98	60 - 140	98	60 - 140	98	%		
8312883	Conductivity	2016/06/29			101	90 - 110	<1.0	uS/cm	0.69	20
8312886	Alkalinity (Total as CaCO3)	2016/06/29			96	80 - 120	<0.50	mg/L	NC	20
8312886	Bicarbonate (HCO3)	2016/06/29					<0.50	mg/L	NC	20
8312886	Carbonate (CO3)	2016/06/29					<0.50	mg/L	NC	20
8312886	Hydroxide (OH)	2016/06/29					<0.50	mg/L	NC	20
8313009	F2 (C10-C16 Hydrocarbons)	2016/06/30	94	50 - 130	102	70 - 130	<0.15	mg/L	NC	40
8313009	F3 (C16-C34 Hydrocarbons)	2016/06/30	123	50 - 130	118	70 - 130	<0.15	mg/L	NC	40
8313009	F4 (C34-C50 Hydrocarbons)	2016/06/30	90	50 - 130	99	70 - 130	<0.15	mg/L	NC	40
8313308	Benzene	2016/06/29	90	70 - 130	94	70 - 130	<0.40	ug/L	NC	40
8313308	Ethylbenzene	2016/06/29	97	70 - 130	97	70 - 130	<0.40	ug/L	NC	40
8313308	F1 (C6-C10) - BTEX	2016/06/29					<300	ug/L	NC	40
8313308	F1 (C6-C10)	2016/06/29	85	70 - 130	99	70 - 130	<300	ug/L	NC	40
8313308	m & p-Xylene	2016/06/29	98	70 - 130	99	70 - 130	<0.80	ug/L	NC	40
8313308	Methyl-tert-butylether (MTBE)	2016/06/29	116	70 - 130	120	70 - 130	<4.0	ug/L	NC	40
8313308	o-Xylene	2016/06/29	102	70 - 130	104	70 - 130	<0.40	ug/L	NC	40
8313308	Toluene	2016/06/29	90	70 - 130	92	70 - 130	<0.40	ug/L	NC	40
8313308	Xylenes (Total)	2016/06/29					<0.80	ug/L	NC	40
8313471	Total Aluminum (Al)	2016/06/28	98	80 - 120	107	80 - 120	3.7, RDL=3.0	ug/L		
8313471	Total Antimony (Sb)	2016/06/28	99	80 - 120	99	80 - 120	<0.50	ug/L		
8313471	Total Arsenic (As)	2016/06/28	NC	80 - 120	100	80 - 120	<0.10	ug/L	1.7	20
8313471	Total Barium (Ba)	2016/06/28	94	80 - 120	98	80 - 120	<1.0	ug/L		
8313471	Total Beryllium (Be)	2016/06/28	96	80 - 120	102	80 - 120	<0.10	ug/L		
8313471	Total Bismuth (Bi)	2016/06/28	94	80 - 120	94	80 - 120	<1.0	ug/L		
8313471	Total Boron (B)	2016/06/28	NC	80 - 120	98	80 - 120	<50	ug/L		
8313471	Total Cadmium (Cd)	2016/06/28	98	80 - 120	101	80 - 120	<0.010	ug/L		
8313471	Total Chromium (Cr)	2016/06/28	99	80 - 120	101	80 - 120	<1.0	ug/L		
8313471	Total Cobalt (Co)	2016/06/28	98	80 - 120	100	80 - 120	<0.50	ug/L		
8313471	Total Copper (Cu)	2016/06/28	99	80 - 120	102	80 - 120	<0.50	ug/L		

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Maxxam Job #: B651848
Report Date: 2016/07/11

QUALITY ASSURANCE REPORT(CONT'D)

ENVIRONMENT CANADA
Site Location: EUREKA, NV

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8313471	Total Iron (Fe)	2016/06/28	111	80 - 120	109	80 - 120	<10	ug/L		
8313471	Total Lead (Pb)	2016/06/28	92	80 - 120	94	80 - 120	<0.20	ug/L		
8313471	Total Lithium (Li)	2016/06/28	NC	80 - 120	97	80 - 120	<5.0	ug/L		
8313471	Total Manganese (Mn)	2016/06/28	101	80 - 120	98	80 - 120	<1.0	ug/L		
8313471	Total Molybdenum (Mo)	2016/06/28	100	80 - 120	95	80 - 120	<1.0	ug/L		
8313471	Total Nickel (Ni)	2016/06/28	97	80 - 120	102	80 - 120	<1.0	ug/L		
8313471	Total Selenium (Se)	2016/06/28	94	80 - 120	101	80 - 120	<0.10	ug/L		
8313471	Total Silicon (Si)	2016/06/28					<100	ug/L		
8313471	Total Silver (Ag)	2016/06/28	104	80 - 120	99	80 - 120	<0.020	ug/L		
8313471	Total Strontium (Sr)	2016/06/28	NC	80 - 120	100	80 - 120	<1.0	ug/L		
8313471	Total Thallium (Tl)	2016/06/28	94	80 - 120	93	80 - 120	<0.050	ug/L		
8313471	Total Tin (Sn)	2016/06/28	98	80 - 120	105	80 - 120	<5.0	ug/L		
8313471	Total Titanium (Ti)	2016/06/28	109	80 - 120	104	80 - 120	<5.0	ug/L		
8313471	Total Uranium (U)	2016/06/28	93	80 - 120	95	80 - 120	<0.10	ug/L		
8313471	Total Vanadium (V)	2016/06/28	94	80 - 120	101	80 - 120	<5.0	ug/L		
8313471	Total Zinc (Zn)	2016/06/28	NC	80 - 120	115	80 - 120	<5.0	ug/L		
8313471	Total Zirconium (Zr)	2016/06/28					<0.50	ug/L		
8313674	Dissolved Chloride (Cl)	2016/06/28			100	80 - 120	<0.50	mg/L		
8313959	Total Ammonia (N)	2016/06/28	101	80 - 120	99	80 - 120	<0.0050	mg/L	1.6	20
8314287	Total Suspended Solids	2016/06/29			99	80 - 120	<4.0	mg/L	NC	20
8314350	Total Oil and grease	2016/06/29			95	70 - 130	<1.0	mg/L		
8314628	Total Organic Carbon (C)	2016/06/29	NC	80 - 120	113	80 - 120	<0.50	mg/L	NC	20
8314844	Phenols	2016/06/29	95	80 - 120	93	80 - 120	<0.0010	mg/L	NC	20
8315352	Dissolved Sulphate (SO4)	2016/06/29			96	80 - 120	0.51, RDL=0.50	mg/L		
8315488	Nitrate plus Nitrite (N)	2016/06/29	91	80 - 120	105	80 - 120	<0.020	mg/L	NC	25
8316497	Total Nitrogen (N)	2016/07/05	94	80 - 120	98	80 - 120	<0.020	mg/L	NC	20

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Maxxam Job #: B651848
Report Date: 2016/07/11

QUALITY ASSURANCE REPORT(CONT'D)

ENVIRONMENT CANADA
Site Location: EUREKA, NV

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8325607	Total Mercury (Hg)	2016/07/11	99	80 - 120	103	80 - 120	<0.010	ug/L	NC	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B651848
Report Date: 2016/07/11

ENVIRONMENT CANADA
Site Location: EUREKA, NV

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Andy Lu, Ph.D., P.Chem., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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