NWB Annual Report **Year being reported:** 2011

License No: 3BC-EUR1116 **Issued Date:** June 7, 2011
Expiry Date: June 7, 2016

Project Name: Eureka Weather Station

Licensee: Environment Canada

Mailing Address: 355 River Road,
Ottawa, ON, K1A 0H3
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 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)
2,966	Actual Quantity Used Domestic (cu.m)
0	Quantity Allowable Drilling (cu.m)
0	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- [x] Solid Waste Disposal
- [x] Sewage
- [ ] Drill Waste
- [x] 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

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 were no unauthorized discharges during 2011.
Part H Section 1 a. to 1 e. of water licence 3BC-EUR1116
The Operations & Maintenance Manual is being updated as per requirements

Revisions to the Spill Contingency Plan

Other: (see additional details)

Additional Details:

Part G Section 1 a. to 1 f. of water licence 3BC-EUR1116
The Spill Contigency Plan is being updated as per water licence requirements

Revisions to the Abandonment and Restoration Plan

AR addendum attached for Board consideration

Additional Details:

Part I Section 2 a. to 2 d. of water licence 3BC-EUR1116
The AR addendum is attached as Appendix I of this application for Board Consideration as required. The entire revised AR plan will be forwarded seperately.

Progressive Reclamation Work Undertaken

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

Work completed in 2011

a. Replacement Mobile Fuel Tank Trailer was purchased & arrived on 2011 Sealift.

b. Rigid Fuel Containment Systems for fuel storage areas and fuel transfer areas purchased in 2011 and sent via Sealift 2011

c. Storage building replacement project initiated in 2011. Design concepts and planning schedules to be sent to NWB for review in 2012.

d. Heat recovery system modification project canceled in 2011.

e. Internal review of Geotechnical study and associated recommendations for the water lagoon, sewage lagoon, and runway held with all relevant stakeholders in order to establish future path forward.

Work planned for 2012

a.Study on decommissioning of surplus buildings re-scheduled for 2012/13 due to funding limitations in 2011/12.

b. The process of decanting the sewage lagoon will be modified which will involve floating the pump intake in the effluent, in an effort to reduce the TSS levels within the pumped effluent. The samples will be analyzed for additional parameters as requested by the NWB recommendations. Wastewater and sludge to be sampled and tested for metals and other parameters in order to determine suitability for future sludge disposal upon decomissioning of current sewage lagoon.

c. Project initiated for the purchase equipment such as a new drum washer/crusher system and portable containment berms for empty drum disposal processes and storage areas.

d. Additional Rigid Fuel Containment Systems for fuel storage areas and fuel transfer areas to be purchased in 2012 and sent via Sealift 2012 and sealift 2013.

e. Sewage lagoon replacement project design delayed as a study is underway to re-evaluate system required to meet new emerging regulations for wastewater discharge limits from Environment Canada.

f. Water Lagoon recapitalization project entering refined study phase to determine feasibility of new lagoon location and possible requirements for contaminated soil remediation & further geotechnical investigation.

g. Runway recapitalization project design phase underway.

Results of the Monitoring Program including:

Details attached

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

No additional sampling requested by an Inspector or the Board

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

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)

Inspection Report received July 23rd 2011 for July 19th 2011 inspection of Eureka. See Appendix J of report for a description of remedy actions taking place in order to rectify deficiencies noted from the inspection.

Any additional comments or information for the Board to consider

Date Submitted:	March 29, 2012	
Submitted/Prepared by:	Carl Carroll	
Contact Information:	**Tel:**	613-990-8376
	Fax:	613-998-1062
	email:	Carl.Carroll@ec.gc.ca

Appendix A
Quantity of Raw Water

QUANTITIES OF FRESH WATER OBTAINED Eureka 2011

Fresh Water: Fresh Water Lagoon

2 pump capacities: Tsurmi Pumps Model LB2-400 with a 30' head ~ 19 gal/min:

Pumping began on June 27 and ended July 6 due lack of water
= 9 days x 24 hrs x 60 min x 19 gal/min = 246,240 gallons
Pumping resumed July 23 to Aug 3 with 1 pump
= 11 days x 24 hrs x 60 min x 19 gal/min = 300,960 gallons
Pumping continued from Aug 4 - 14 with 2 pumps
= 11 days x 24 hrs x 60 min x 38 gal/min = 601,920 gallons
Pumping continued from Aug 15 - 24 with 1 pump
= 10 days x 24 hrs x 60 min x 19 gal/min = 273,600 gallons
Pumping continued from Aug 25 to Sep 9 with 2 pumps
= 15 days x 24 hrs x 60 min x 38 gal/min = 820,800 gallons

Total water pumped = ~2,243,520 gallons or ~8492.647 m3

Actual consumption from water meter in Powerhouse from Oct 10 to Sep 11 = 937,784.4 gal or 3549.9 m3
(Lagoon water holding capacity is estimated at approximately 2,500m3 and it is believed that the balance of water pumped, in order to maintain a full lagoon at the end of the season, was used during summer operations and due to loss of water via leeching from the unfrozen lagoon.)

Intake hose screen has ¼" diameter holes

Pumping took place after initial rush of stream had taken place and the amount of silt/mud had diminished.

Appendix B
Quality of Raw Water

EUREKA RAW WATER ANALYSIS 2007-2010

	RAW WATER Lagoon					Guidelines mg/l CANADIAN[i]	
						MAC[1]	OG[2]/AO[3]
Parameter	**2007**	**2008**	**2009**	**2010**	**2011**		
TDS			256	482	2150		
Organic Carbon	61.2	40.8	0.9	<0.5	3.2		
Hardness	1300	1330	132	292	1240		
Coliforms, Total		<1.0		<1.0	4.1	0/100 ml	
Escherichia coli		<1.0		<1.0	<1.0	0/100 ml	
Aluminum	<0.030	0.0092	0.964	0.0044	0.036		0.2
Antimony			0.0002	<0.0001	<0.0001		
Arsenic			<0.0002	<0.0002	0.0003		
Barium	0.0781	0.0657	0.0064	0.0190	0.0687	1	
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Boron	0.233	0.103				5	
Cadmium	0.0003	<0.00005	<0.0001	<0.00005	<0.00005	0.005	
Cesium			<0.0001	<0.0001	<0.0001		
Chromium	0.0003	0.0002	0.0002	<0.0001	0.0001	0.05	
Cobalt	0.0006	0.0004	<0.0001	<0.0001	0.0007		
Copper	0.0016	0.022	0.0066	0.0282	0.0012		<1.0
Iron	0.0536	<0.050	0.151	<0.050	0.009		<0.3
Lead	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.01	
Lithium			0.0041	0.0094	0.0368		
Manganese	0.0182	0.0347	0.0051	0.0071	0.0282		<0.05
Molybdenum	0.0006	0.0006	0.0001	0.0001	0.0004		
Nickel	0.0035	0.003	0.0006	0.0007	0.0061		
Rubidium			0.0005	0.0009	0.0029		
Selenium			<0.0005	0.0006	0.0022		
Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Strontium	1.34	1.18	0.112	0.288	1.11		
Thallium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Titanium	0.0014	0.001	0.0013	0.0001	0.0003		
Uranium			0.0002	0.0003	0.0001	0.02	
Vanadium	0.0003	<0.0001	0.0003	<0.0001	<0.0001		
Zinc	0.01	0.0039	<0.0005	0.0019	0.0021		<5.0
Silicon	2.51	2.27					
*Bromodicholormethane			<0.005	<0.005	n/a	0.016	
*Bromoform			<0.005	<0.005	n/a		
*Dibromochloromethane			<0.005	<0.005	n/a		
*Trihalomethanes	0.005		<0.005	<0.005	n/a	0.1	

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

iGuidelines 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

http://www.ccme.ca/assets/pdf/cda_wide_strategy_mwwe_final_e.pdf

iiUS 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

Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- FINAL REPORT -

Prepared For: Environment Canada
Eureka Weather Station

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

Attn: **Harvey Pukin** **Facsimile:**

Final report has been reviewed and approved by:

Angelique Ruzindana
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) 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.

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG0511 **Taiga Sample ID:** 001

Client Project:
Sample Type: Lagoon
Received Date: 05-May-11
Sampling Date: 05-May-11
Sampling Time: 6:30
Location: Lagoon/Reverse Osmosis/Tap
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	2150	10	mg/L	10-May-11	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	3.2	0.5	mg/L	13-May-11	SM5310:B	
Major Ions						
Hardness	1240	0.7	mg/L	06-May-11	SM2340:B	
Microbiology						
Coliforms, Total	4.1	1.0	MPN/100mL	05-May-11	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	05-May-11	SM9223:B	
Organics						
Bromodichloromethane			mg/L		EPA8260B	111
Bromoform			mg/L		EPA8260B	111
Chloroform			mg/L		EPA8260B	111
Dibromochloromethane			mg/L		EPA8260B	111
Trihalomethanes, Total			mg/L		EPA8260B	111

ReportDate: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG0511 **Taiga Sample ID:** 001

Trace Metals, Total

Aluminum	36.0	0.6	µg/L	10-May-11	EPA200.8
Antimony	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Arsenic	0.3	0.2	µg/L	10-May-11	EPA200.8
Barium	68.7	0.1	µg/L	10-May-11	EPA200.8
Beryllium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Cadmium	< 0.05	0.05	µg/L	10-May-11	EPA200.8
Cesium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Chromium	0.1	0.1	µg/L	10-May-11	EPA200.8
Cobalt	0.7	0.1	µg/L	10-May-11	EPA200.8
Copper	1.2	0.2	µg/L	10-May-11	EPA200.8
Iron	9	5	µg/L	10-May-11	EPA200.8
Lead	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Lithium	36.8	0.2	µg/L	10-May-11	EPA200.8
Manganese	28.2	0.1	µg/L	10-May-11	EPA200.8
Molybdenum	0.4	0.1	µg/L	10-May-11	EPA200.8
Nickel	6.1	0.1	µg/L	10-May-11	EPA200.8
Rubidium	2.9	0.1	µg/L	10-May-11	EPA200.8
Selenium	2.2	0.3	µg/L	10-May-11	EPA200.8
Silver	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Strontium	1110	0.1	µg/L	10-May-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Titanium	0.3	0.1	µg/L	10-May-11	EPA200.8
Uranium	1.5	0.1	µg/L	10-May-11	EPA200.8

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG0511 **Taiga Sample ID:** 001

Vanadium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Zinc	2.1	0.4	µg/L	10-May-11	EPA200.8

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix B
Quality of Raw Water

RAW WATER: WATER LAGOON: 2010

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- FINAL REPORT -

Prepared For: Environment Canada
Eureka Weather Station

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

Attn: **Harvey Pukin** **Facsimile:**

Final report has been reviewed and approved by:

Helene Harper _____

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) 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.

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG0510 **Taiga Sample ID:** 001

Client Project:
Sample Type: Lagoon
Received Date: 06-May-10
Sampling Date: 06-May-10
Sampling Time: 6:30
Location: Lagoon/ReverseOsmosis/Tap
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	482	10	mg/L	11-May-10	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	< 0.5	0.5	mg/L	08-May-10	SM5310:B	
Major Ions						
Hardness	292	0.7	mg/L	07-May-10	SM2340:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	06-May-10	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	06-May-10	SM9223:B	
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Trihalomethanes, Total	< 0.005	0.005	mg/L	13-May-10	EPA8260B	

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG0510 **Taiga Sample ID:** 001

Trace Metals, Total

Aluminum	4.4	0.6	µg/L	07-May-10	EPA200.8
Antimony	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Arsenic	< 0.2	0.2	µg/L	07-May-10	EPA200.8
Barium	19.0	0.1	µg/L	07-May-10	EPA200.8
Beryllium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Cadmium	< 0.05	0.05	µg/L	07-May-10	EPA200.8
Cesium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Chromium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Cobalt	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Copper	28.2	0.2	µg/L	07-May-10	EPA200.8
Iron	< 5	5	µg/L	07-May-10	EPA200.8
Lead	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Lithium	9.4	0.2	µg/L	07-May-10	EPA200.8
Manganese	7.1	0.1	µg/L	07-May-10	EPA200.8
Molybdenum	0.1	0.1	µg/L	07-May-10	EPA200.8
Nickel	0.7	0.1	µg/L	07-May-10	EPA200.8
Rubidium	0.9	0.1	µg/L	07-May-10	EPA200.8
Selenium	0.6	0.3	µg/L	07-May-10	EPA200.8
Silver	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Strontium	288	0.1	µg/L	07-May-10	EPA200.8
Thallium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Titanium	0.1	0.1	µg/L	07-May-10	EPA200.8
Uranium	0.3	0.1	µg/L	07-May-10	EPA200.8

ReportDate: Friday, May 14, 2010
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Appendix B
Quality of Raw Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EULAG0510 **Taiga Sample ID:** 001

Vanadium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Zinc	1.9	0.4	µg/L	07-May-10	EPA200.8

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix C
Quality of Tap Water

EUREKA WATER ANALYSIS 2008-2011: TAP WATER

	TAP WATER				GUIDELINES (mg/l)			
					CANADIAN[i]		US EPA[ii]	
Parameter	2008	2009	2010	2011	MAC[a]	OG[c]/AO[o]	MCL[d]	MCLG[o]
TDS		524	1510	1920				
Organic Carbon		1.5	1.8	2.7				
Hardness		112	26.7	664				
Coliforms, Total	<1.0	<1.0	<1.0	<1.0	0/100 ml		100/100ml	0
Escherichia coli	<1.0	<1.0	<1.0	<1.0	0/100 ml			0
Aluminum	0.0053	0.046	0.007	0.0291		0.2	0.05-0.2	
Antimony		0.0002	<0.0001	<0.0001				
Arsenic		<0.0002	0.0003	0.0003				
Barium	0.0165	0.0054	0.0027	0.0213	1		2	2
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001			0.004	
Boron	0.0992				5			
Cadmium	<0.00005	<0.0001	<0.00005	<0.00005	0.005		0.005	0.005
Cesium		<0.0001	<0.0001	<0.0001				
Chromium	0.0003	0.0002	0.0002	0.0001	0.05		0.1	0.1
Cobalt	0.0001	<0.0001	<0.0001	0.0005				
Copper	0.134	0.0652	0.371	0.101		<1.0		1.3
Iron	<0.050	0.101	0.012	0.008		<0.3	0.3	
Lead	0.0012	0.0001	0.0003	<0.0001	0.01		0.015	0
Lithium		0.0037	0.0317	0.0421				
Manganese	0.0092	0.0036	0.0037	0.0188		<0.05	0.05	
Molybdenum	0.0008	0.0002	0.0003	0.0003				
Nickel	0.0015	0.0007	0.0024	0.0037				
Rubidium		0.0004	0.0019	0.0029				
Selenium		0.0005	0.0012	0.0018				
Silver	<0.0001	<0.0001	<0.0001	<0.0001			0.1	
Strontium	0.28	0.0898	0.0393	0.363				
Thallium	<0.0001	<0.0001	<0.0001	<0.0001				
Titanium	0.0008	<0.0001	0.0004	0.0004				
Uranium		0.0003	0.0009	0.0015				
Vanadium	<0.0001	0.0002	<0.0001	<0.0001				
Zinc	0.109	0.047	0.0656	0.0549		<5.0	5	
Silicon	0.0024							
Bromodicholormethane		0.01	0.006	n/a	0.016			
Bromoform		0.052	0.068	n/a				
Dibromochloromethane		0.027	0.026	n/a				
Trihalomethanes		0.092	0.101	n/a	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

[a]Maxiumum Acceptable Concentration
[c]Aesthetic Objectives
[o]Operational Guidance Values
[d]Maximum Contaminant Level
[o]Maximum Contaminant Level Goal

Appendix C
Quality of Tap Water

TAP WATER QUALITY 2011

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0511 **Taiga Sample ID:** 003

Client Project:
Sample Type: Tap
Received Date: 05-May-11
Sampling Date: 05-May-11
Sampling Time: 6:30
Location: Lagoon/Reverse Osmosis/Tap
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	1920	10	mg/L	10-May-11	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	2.7	0.5	mg/L	13-May-11	SM5310:B	
Major Ions						
Hardness	664	0.7	mg/L	06-May-11	SM2340:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	05-May-11	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	05-May-11	SM9223:B	
Organics						
Bromodichloromethane			mg/L		EPA8260B	111
Bromoform			mg/L		EPA8260B	111
Chloroform			mg/L		EPA8260B	111
Dibromochloromethane			mg/L		EPA8260B	111
Trihalomethanes, Total			mg/L		EPA8260B	111

ReportDate: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix C
Quality of Tap Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0511 **Taiga Sample ID:** 003

Trace Metals, Total

Aluminum	29.1	0.6	µg/L	10-May-11	EPA200.8
Antimony	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Arsenic	0.3	0.2	µg/L	10-May-11	EPA200.8
Barium	21.3	0.1	µg/L	10-May-11	EPA200.8
Beryllium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Cadmium	< 0.05	0.05	µg/L	10-May-11	EPA200.8
Cesium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Chromium	0.1	0.1	µg/L	10-May-11	EPA200.8
Cobalt	0.5	0.1	µg/L	10-May-11	EPA200.8
Copper	101	0.2	µg/L	10-May-11	EPA200.8
Iron	8	5	µg/L	10-May-11	EPA200.8
Lead	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Lithium	42.1	0.2	µg/L	10-May-11	EPA200.8
Manganese	18.8	0.1	µg/L	10-May-11	EPA200.8
Molybdenum	0.3	0.1	µg/L	10-May-11	EPA200.8
Nickel	3.7	0.1	µg/L	10-May-11	EPA200.8
Rubidium	2.9	0.1	µg/L	10-May-11	EPA200.8
Selenium	1.8	0.3	µg/L	10-May-11	EPA200.8
Silver	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Strontium	363	0.1	µg/L	10-May-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Titanium	0.4	0.1	µg/L	10-May-11	EPA200.8
Uranium	1.5	0.1	µg/L	10-May-11	EPA200.8

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix C
Quality of Tap Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0511 **Taiga Sample ID:** 003

Vanadium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Zinc	54.9	0.4	µg/L	10-May-11	EPA200.8

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix C
Quality of Tap Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0511 **Taiga Sample ID:** 003

- DATA QUALIFERS -

Data Qualifier Descriptions:

111 *Sample bottle contained air bubble; analysis not possible.*

*** 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

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix C
Quality of Tap Water

TAP WATER QUALITY 2010

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0510 **Taiga Sample ID:** 003

Client Project:
Sample Type: Tap
Received Date: 06-May-10
Sampling Date: 06-May-10
Sampling Time: 6:30
Location: Lagoon/ReverseOsmosis/Tap
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	1510	10	mg/L	11-May-10	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	1.8	0.5	mg/L	08-May-10	SM5310:B	
Major Ions						
Hardness	26.7	0.7	mg/L	07-May-10	SM2340:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	06-May-10	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	06-May-10	SM9223:B	
Organics						
Bromodichloromethane	0.006	0.005	mg/L	13-May-10	EPA8260B	
Bromoform	0.068	0.005	mg/L	13-May-10	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Dibromochloromethane	0.026	0.005	mg/L	13-May-10	EPA8260B	
Trihalomethanes, Total	0.101	0.005	mg/L	13-May-10	EPA8260B	

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix C
Quality of Tap Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0510 **Taiga Sample ID:** 003

Trace Metals, Total

Aluminum	7.0	0.6	µg/L	07-May-10	EPA200.8
Antimony	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Arsenic	0.3	0.2	µg/L	07-May-10	EPA200.8
Barium	2.7	0.1	µg/L	07-May-10	EPA200.8
Beryllium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Cadmium	< 0.05	0.05	µg/L	07-May-10	EPA200.8
Cesium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Chromium	0.2	0.1	µg/L	07-May-10	EPA200.8
Cobalt	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Copper	371	0.2	µg/L	07-May-10	EPA200.8
Iron	12	5	µg/L	07-May-10	EPA200.8
Lead	0.3	0.1	µg/L	07-May-10	EPA200.8
Lithium	31.7	0.2	µg/L	07-May-10	EPA200.8
Manganese	3.7	0.1	µg/L	07-May-10	EPA200.8
Molybdenum	0.3	0.1	µg/L	07-May-10	EPA200.8
Nickel	2.4	0.1	µg/L	07-May-10	EPA200.8
Rubidium	1.9	0.1	µg/L	07-May-10	EPA200.8
Selenium	1.2	0.3	µg/L	07-May-10	EPA200.8
Silver	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Strontium	39.3	0.1	µg/L	07-May-10	EPA200.8
Thallium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Titanium	0.4	0.1	µg/L	07-May-10	EPA200.8
Uranium	0.9	0.1	µg/L	07-May-10	EPA200.8

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix C
Quality of Tap Water

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUTAP0510 **Taiga Sample ID:** 003

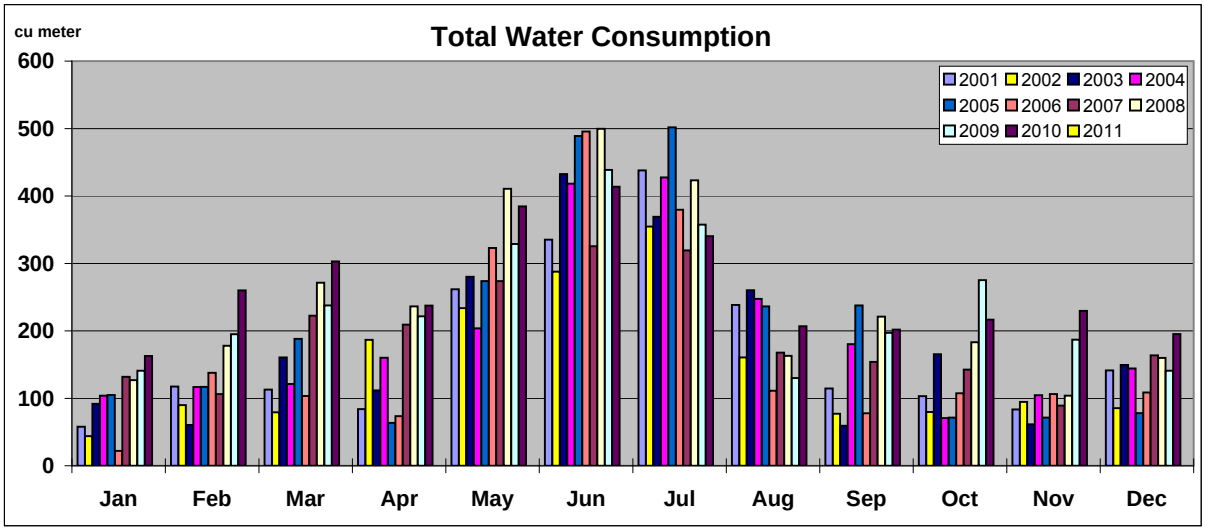
Vanadium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Zinc	65.6	0.4	µg/L	07-May-10	EPA200.8

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix D
Quantity of Drinking Water Consumed

Total Water Consumption

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
57.8	43.8	91.7	104.0	104.9	22.0	131.9	126.9	140.9	162.7	212.5	**Jan**
117.5	90.0	60.6	116.7	117.0	137.9	106.3	178.0	194.9	260.0	288.2	**Feb**
113.0	79.2	160.6	121.2	188.2	103.5	222.6	271.4	237.7	302.9	251.4	**Mar**
84.1	186.8	111.7	160.1	63.7	73.6	209.2	236.3	221.5	237.5	436.6	**Apr**
261.8	233.8	280.3	203.7	273.9	322.8	273.8	410.7	328.8	384.5	481.3	**May**
335.3	287.9	432.5	418.2	489.0	495.7	325.6	499.7	438.7	413.7	440.6	**Jun**
438.0	354.8	369.1	427.6	501.8	379.6	319.3	423.3	357.6	340.4	311.4	**Jul**
238.5	160.6	260.3	247.4	236.3	111.3	167.7	163.0	130.0	206.9	211.6	**Aug**
114.5	77.1	59.4	180.3	237.8	77.8	153.9	221.1	197.2	202.0	274.9	**Sep**
103.1	79.6	165.3	70.8	71.5	107.4	142.6	183.1	275.1	216.5	274.4	**Oct**
83.5	94.6	61.5	104.6	71.5	106.4	89.2	103.9	187.0	229.6	272.4	**Nov**
141.5	85.5	149.5	144.2	78.1	108.6	163.6	159.9	141.0	195.3	307.0	**Dec**
2088.6	1773.7	2202.5	2298.8	2433.7	2046.6	2305.7	2977.3	2850.4	3152.0	3762.3	**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	**Monthly Avg**



Appendix E
Quality of Drinking Water Consumed

EUREKA WATER ANALYSIS 2007-2011: REVERSE OSMOSIS

	REVERSE OSMOSIS DRINKING WATER					GUIDELINES (mg/l)			
						CANADIAN[i]		US EPA[ii]	
						MAC[1]	OG[2]/AO[3]	MCL[4]	MCLG[5]
Parameter	**2007**	**2008**	**2009**	**2010**	**2011**				
TSS			208	<10	40				
Organic Carbon	<0.5		0.5	<0.5	<0.5				
Hardness	1.7		11.1	2.1	3.2				
Coliforms, Total		<1.0	<1.0	<1.0	<1.0	0/100 ml		100/100ml	0
Escherichia coli		<1.0	<1.0	<1.0	<1.0	0/100 ml			0
Aluminum	0.0009	0.0019	0.017	0.0012	<0.6		0.2	0.05-0.2	
Antimony			<0.0001	<0.0001	<0.0001				
Arsenic			<0.0002	<0.0002	<0.0002				
Barium	<0.0001	0.0027	0.0022	0.0003	<0.0001	1		2	2
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			0.004	
Boron	0.149	0.0092				5			
Cadmium	<0.00005	<0.00005	<0.00005	0.00009	<0.00005	0.005		0.005	0.005
Cesium			<0.0001	<0.0001	<0.0001				
Chromium	<0.0001	0.001	<0.0001	0.0001	<0.0001	0.05		0.1	0.1
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Copper	0.0101	0.0297	0.0133	0.0096	0.0026		<1.0		1.3
Iron	<0.050	<0.050	0.01	<0.050	<0.005		<0.3	0.3	
Lead	0.0003	0.0057	0.0001	0.0007	<0.0001	0.01		0.015	0
Lithium			0.0009	0.0006	0.0014				
Manganese	<0.0001	0.0001	0.0005	0.0002	<0.0001		<0.05	0.05	
Molybdenum	<0.0001	0.0003	<0.0001	0.0002	<0.0001				
Nickel	0.0034	0.0013	0.0016	0.0005	0.0002				
Rubidium			<0.0001	<0.0001	<0.0001				
Selenium			0.0003	<0.0003	<0.0003				
Silver	<0.0001	0.0001	<0.0001	<0.0001	<0.0001			0.1	
Strontium	0.0004	0.0007	0.0072	0.0022	0.0015				
Thallium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Titanium	<0.0001	<0.0001	0.0003	0.0001	<0.0001				
Uranium			<0.0001	<0.0001	<0.0001				
Vanadium	<0.0001	<0.0001	<0.0001	0.0001	<0.0001				
Zinc	0.413	0.819	0.0588	0.07	0.0175		<5.0	5	
Silicon	0.00007								
*Bromodicholormethane			<0.005	<0.005	n/a	0.016			
Bromoform			<0.005	0.01	n/a				
Dibromochloromethane			<0.005	0.008	n/a				
Trihalomethanes			<0.005	0.024	n/a	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

[1]Maxiumum Acceptable Concentration
[2]Aesthetic Objectives
[3]Operational Guidance Values
[4]Maximum Contaminant Level
[5]Maximum Contaminant Level Goal

Appendix E
Quality of Drinking Water Consumed

REVERSE OSMOSIS WATER QUALITY 2011

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO0511 **Taiga Sample ID:** 002

Client Project:
Sample Type: Reverse Osmosis
Received Date: 05-May-11
Sampling Date: 05-May-11
Sampling Time: 6:30
Location: Lagoon/Reverse Osmosis/Tap
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	40	10	mg/L	10-May-11	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	< 0.5	0.5	mg/L	13-May-11	SM5310:B	
Major Ions						
Hardness	3.2	0.7	mg/L	06-May-11	SM2340:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	05-May-11	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	05-May-11	SM9223:B	
Organics						
Bromodichloromethane			mg/L		EPA8260B	111
Bromoform			mg/L		EPA8260B	111
Chloroform			mg/L		EPA8260B	111
Dibromochloromethane			mg/L		EPA8260B	111
Trihalomethanes, Total			mg/L		EPA8260B	111

ReportDate: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Appendix E
Quality of Drinking Water Consumed

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO0511 **Taiga Sample ID:** 002

Trace Metals, Total

Aluminum	< 0.6	0.6	µg/L	10-May-11	EPA200.8
Antimony	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Arsenic	< 0.2	0.2	µg/L	10-May-11	EPA200.8
Barium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Beryllium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Cadmium	< 0.05	0.05	µg/L	10-May-11	EPA200.8
Cesium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Chromium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Cobalt	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Copper	2.6	0.2	µg/L	10-May-11	EPA200.8
Iron	< 5	5	µg/L	10-May-11	EPA200.8
Lead	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Lithium	1.4	0.2	µg/L	10-May-11	EPA200.8
Manganese	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Molybdenum	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Nickel	0.2	0.1	µg/L	10-May-11	EPA200.8
Rubidium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Selenium	< 0.3	0.3	µg/L	10-May-11	EPA200.8
Silver	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Strontium	1.5	0.1	µg/L	10-May-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Titanium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Uranium	< 0.1	0.1	µg/L	10-May-11	EPA200.8

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110180

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO0511 **Taiga Sample ID:** 002

Vanadium	< 0.1	0.1	µg/L	10-May-11	EPA200.8
Zinc	17.5	0.4	µg/L	10-May-11	EPA200.8

Report Date: Monday, May 16, 2011
Print Date: Monday, May 16, 2011

REVERSE OSMOSIS WATER QUALITY 2010

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO0510 **Taiga Sample ID:** 002

Client Project:
Sample Type: Reverse Osmosis
Received Date: 06-May-10
Sampling Date: 06-May-10
Sampling Time: 6:30
Location: Lagoon/ReverseOsmosis/Tap
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	< 10	10	mg/L	11-May-10	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	< 0.5	0.5	mg/L	08-May-10	SM5310:B	
Major Ions						
Hardness	2.1	0.7	mg/L	07-May-10	SM2340:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	06-May-10	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	06-May-10	SM9223:B	
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Bromoform	0.010	0.005	mg/L	13-May-10	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	13-May-10	EPA8260B	
Dibromochloromethane	0.008	0.005	mg/L	13-May-10	EPA8260B	
Trihalomethanes, Total	0.024	0.005	mg/L	13-May-10	EPA8260B	

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Appendix E
Quality of Drinking Water Consumed

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO0510 **Taiga Sample ID:** 002

Trace Metals, Total

Aluminum	1.2	0.6	µg/L	07-May-10	EPA200.8
Antimony	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Arsenic	< 0.2	0.2	µg/L	07-May-10	EPA200.8
Barium	0.3	0.1	µg/L	07-May-10	EPA200.8
Beryllium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Cadmium	0.09	0.05	µg/L	07-May-10	EPA200.8
Cesium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Chromium	0.1	0.1	µg/L	07-May-10	EPA200.8
Cobalt	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Copper	9.6	0.2	µg/L	07-May-10	EPA200.8
Iron	< 5	5	µg/L	07-May-10	EPA200.8
Lead	0.7	0.1	µg/L	07-May-10	EPA200.8
Lithium	0.6	0.2	µg/L	07-May-10	EPA200.8
Manganese	0.2	0.1	µg/L	07-May-10	EPA200.8
Molybdenum	0.2	0.1	µg/L	07-May-10	EPA200.8
Nickel	0.5	0.1	µg/L	07-May-10	EPA200.8
Rubidium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Selenium	< 0.3	0.3	µg/L	07-May-10	EPA200.8
Silver	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Strontium	2.2	0.1	µg/L	07-May-10	EPA200.8
Thallium	< 0.1	0.1	µg/L	07-May-10	EPA200.8
Titanium	0.1	0.1	µg/L	07-May-10	EPA200.8
Uranium	< 0.1	0.1	µg/L	07-May-10	EPA200.8

Report Date: Friday, May 14, 2010
Print Date: Friday, May 14, 2010

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 100186

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EURO0510 **Taiga Sample ID:** 002

Vanadium	0.1	0.1	µg/L	07-May-10	EPA200.8
Zinc	70.0	0.4	µg/L	07-May-10	EPA200.8

Appendix E
Quality of Drinking Water Consumed

REVERSE OSMOSIS WATER QUALITY 2009

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 290375

- FINAL REPORT -

Prepared For: Environment Canada
Eureka Weather Station

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

Attn: Harvey Pukin **Facsimile:**

Final report has been reviewed and approved by:

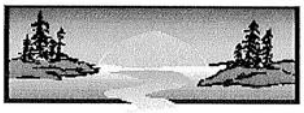
Angelique Ruzindana
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association of Environmental Analytical Laboratories (CAEAL) as a testing laboratory for specific tests registered with CAEAL.
- 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: Thursday, July 23, 2009
Print Date: Thursday, July 23, 2009

Appendix E
Quality of Drinking Water Consumed



Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 290373

- CERTIFICATE OF ANALYSIS -

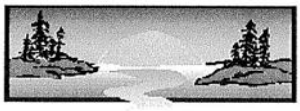
Client Sample ID: EUOW0709 **Taiga Sample ID: 002**

Client Project:
Sample Type: Freshwater
Received Date: 09-Jul-09
Sampling Date: 09-Jul-09
Sampling Time: 7:30
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Solids, Total Dissolved	208	10	mg/L	15-Jul-09	SM2540:C	
Inorganics - Nutrients						
Organic Carbon, Total	0.5	0.5	mg/L	15-Jul-09	SM5310:B	
Major Ions						
Hardness	11.1	0.7	mg/L	10-Jul-09	SM2340:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100mL	09-Jul-09	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100mL	09-Jul-09	SM9223:B	
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	13-Jul-09	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	13-Jul-09	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	13-Jul-09	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	13-Jul-09	EPA8260B	
Trihalomethanes, Total	< 0.005	0.005	mg/L	13-Jul-09	EPA8260B	

ReportDate: Thursday, July 23, 2009
Print Date: Thursday, July 23, 2009

Appendix E
Quality of Drinking Water Consumed



Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 290373

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUOW0709 **Taiga Sample ID: 002**

Trace Metals, Total

Aluminum	17.0	0.6	µg/L	21-Jul-09	EPA200.8
Antimony	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Arsenic	< 0.2	0.2	µg/L	21-Jul-09	EPA200.8
Barium	2.2	0.1	µg/L	21-Jul-09	EPA200.8
Beryllium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Cadmium	< 0.05	0.05	µg/L	21-Jul-09	EPA200.8
Cesium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Chromium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Cobalt	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Copper	13.3	0.2	µg/L	21-Jul-09	EPA200.8
Iron	10	5	µg/L	21-Jul-09	EPA200.8
Lead	0.1	0.1	µg/L	21-Jul-09	EPA200.8
Lithium	0.9	0.2	µg/L	21-Jul-09	EPA200.8
Manganese	0.5	0.1	µg/L	21-Jul-09	EPA200.8
Molybdenum	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Nickel	1.6	0.1	µg/L	21-Jul-09	EPA200.8
Rubidium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Selenium	< 0.3	0.3	µg/L	21-Jul-09	EPA200.8
Silver	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Strontium	7.2	0.1	µg/L	21-Jul-09	EPA200.8
Thallium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Titanium	0.3	0.1	µg/L	21-Jul-09	EPA200.8
Uranium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8

ReportDate: Thursday, July 23, 2009
Print Date: Thursday, July 23, 2009

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 290373

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUOW0709 **Taiga Sample ID: 002**

Vanadium	< 0.1	0.1	µg/L	21-Jul-09	EPA200.8
Zinc	55.8	0.4	µg/L	21-Jul-09	EPA200.8

ReportDate: Thursday, July 23, 2009
Print Date: Thursday, July 23, 2009

Appendix F
Quantity of Waste Water Discharged

QUANTITIES OF WASTE WATER DISCHARGED

Eureka 2011

Waste Water: Sewage Lagoon

1. 1 pump capacity:
   -Monarch Pump Model TT30 Type E with attached hose ~ 150 gal/min

2. Pump time*:
   -July decanting began on July 6 and lasted to July 8 = 54 hours
   54 hours x 60 min x 150 gal/min = ~486,000 gal or ~1839.71 m3

   -Second decanting started Sep 7 and lasted to Sep 8 = 36 hours
   36 hours x 60 min x 150 gal/min = ~324,000 gal or ~1226.473 m3

   -Total for both decanting was = ~3066 m3

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 in 2007, 2008, 2009, 2010 and 2011 to determine the level of compliance with CCME and NWT guidelines for wastewater. This report discusses each exceeding parameter over the 4-year period, potential causes of exceedances, and identifies corrective solutions if applicable.

Effluent exceedances and possible causes

1. Total suspended solids (TSS)

Effluent total suspended solids averaged approximately 91 mg/L for the first decant in 2011 which is below Territorial Guidelines, and 285mg/L for the second decant, which is above Territorial guidelines of 100 mg/L. The first decanting process utilizes a modified method of suspending the pump towards the top of the lagoon during pumping, with the use of a floatation device. This modified decantation process has led to lower TSS levels. The second decant process involved the original pumping process where the pump is situated at the bottom pit of the lagoon and this seems to lead to higher TSS levels. The higher TDS levels and Trace Metals on the second decant might also result from the shorter settling times between discharges due to the need to obtain maximum lagoon capacity before freeze up. Other factors that may lead to higher TSS levels include the presence of;

a. Suspended bacterial solids[1];
b. Algae growth during warmer summer temperatures between decantings. Indicators of algae growth are as follows:

    i. Biological demand (BOD) > 30mg/L (Eureka is consistently above this level)
    ii. pH > 9 (Eureka is consistently at or above this level)
    iii. TSS/BOD ratio > 2 (Eureka is consistently above this level)

c. Silt, clay, cell debris, and bottom solids suspended from lagoon pumping. (There has been above normal levels of silt in our water system which is evident in our water system tanks and by the increased frequency of filter changes required in the last year.)

2. pH

Ph results averaged 9.16 in 2011 which is slightly over the NWB guidelines of 6-9. It was noted that the ph level of the sewage in the holding tank was at 7.1 before it is pumped out to the lagoon. As High pH values are typically caused by excessive algae growth[1], this would explain the elevation of PH levels from those of the holding tank to those of the lagoon during the settling period prior to decantation.

Appendix G
Quality of Waste Water Discharged

3. Iron (Fe)

Effluent iron averaged 0.262 mg/L on the first decant which is within Territorial guidelines. The effluent iron level was higher at 3.3 mg/L on the second decant when the pump was located within the bottom lagoon sump pit. The iron content of the effluent from the holding tank were higher at 0.552 mg/L indicating that the holding tank may be a source of the elevated iron levels. 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.

4. Manganese (Mn)

Manganese has been found at a level averaging 0.053 mg/L on the first decant which is slightly above Territorial guidelines. The Manganese level was at 0.0467 mg/L on the second decant which is below Territorial guidelines. Possible sources of manganese include[3]:

a. Natural sources (soils, rocks, and water). Manganese can be found naturally in water in levels as high as 1.0mg/L. Manganese and iron are often found together in water.;
b. Sources of pollution rich in organic matter (e.g. runoff from landfills, compost, brush or silage piles, or chemicals such as gasoline) can add to the background level by increasing manganese release from soil or bedrock into the surface water.

Next steps for elevated parameters

1. TSS, pH, iron, manganese

For all of these parameters, it is critical to identify the causes of elevated levels before identifying possible solutions. The following steps are proposed for the 2012 season:

a. Collect and analyze the undisturbed effluent (before pumping) in the lagoon to determine TSS, Fe, and Mn concentration. The previous results may be elevated by sediments and are therefore not an accurate reflection of actual wastewater conditions.
b. Collect and analyze the sewage lagoon sludge after decantation of effluent in order to identify elevated parameters and to quantify the suitability of the sludge for future disposal.
c. Continue to collect and analyze waste samples before they reach the lagoon to determine and trend TSS, Fe, and Mn concentrations over time, as levels may be a result of natural systems or other pollution sources.
d. Continue with the modified decantation process where the foot valve of the pumping system is suspended above the bottom sediments to limit contamination of effluent from contact with bottom sediments. This practice may be particularly detrimental to TSS concentrations.
e. Analyze the effluent TSS, if possible, to determine if the nature of the particles are:

i. Sludge
ii. Filamentous bacteria
iii. Sulphur bacteria
iv. Algae

Appendix G
Quality of Waste Water Discharged

Additional Parameters for Analysis

The additional parameters to be analyzed as per the Nunavut Water Board recommendations include Sulphate (SO4 Individual Anion), all the Major Cations, Ammonia – N, and Visible Oil & Grease.

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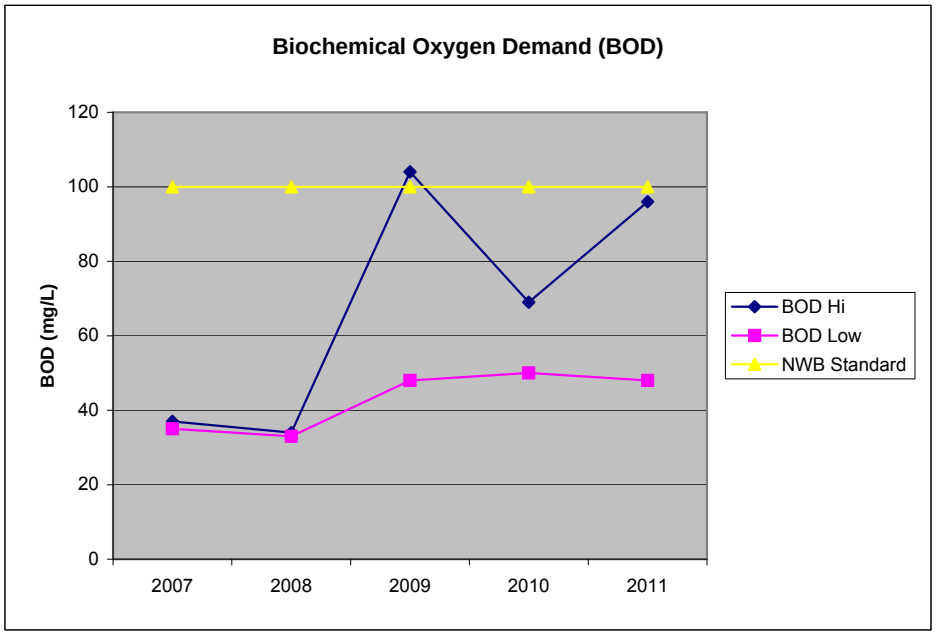
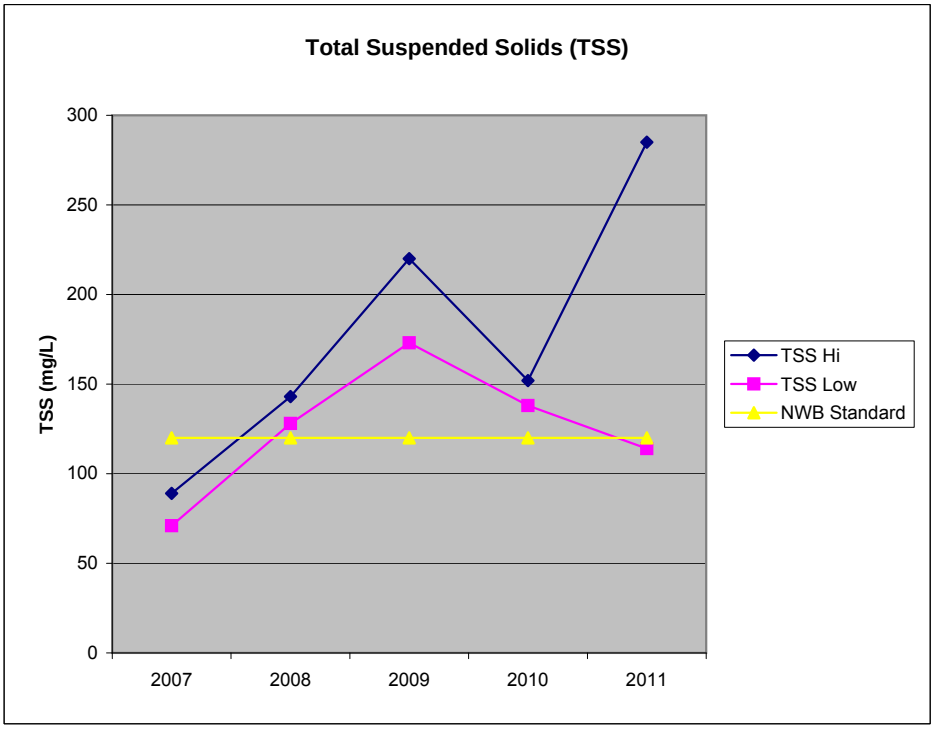
[1]Richard, Michael. Microbiological and Chemical Testing for Troubleshooting lagoons.2003
[2]Tillman, Glenn. Wastewater Treatment: Troubleshooting and Problem Solving.
[3]Connecticut Department of Public Health. Fact Sheet: Manganese in Drinking Water. 2001

Appendix G
Quality of Waste Water Discharged

BOD Results for Eureka Wastewater Lagoon Effluent



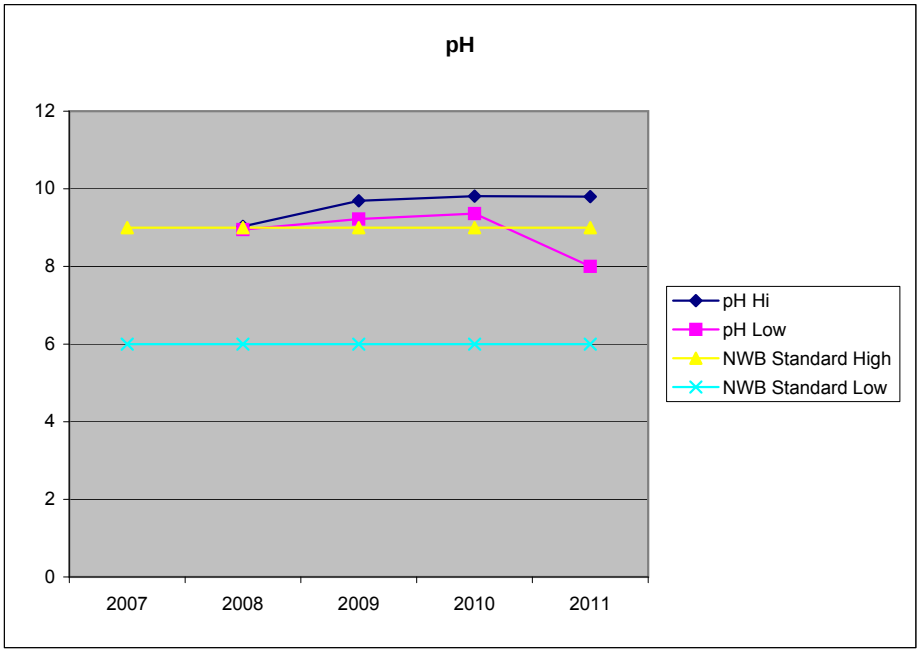
TSS Results for Eureka Wastewater Lagoon Effluent



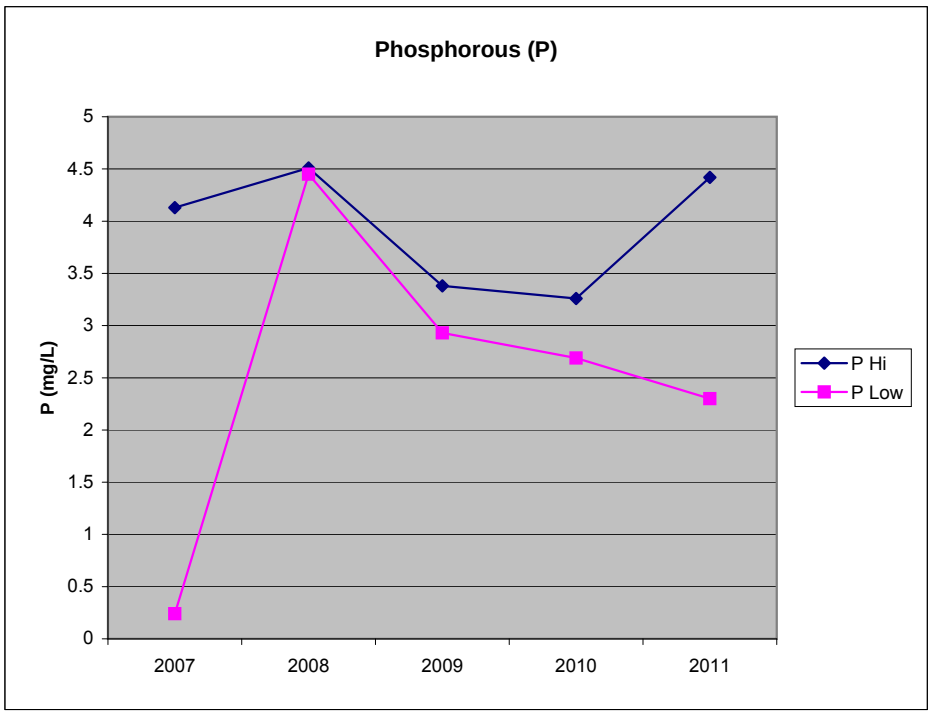
Note: the hi TSS of 285 mg/L occurred on the second decant. Reduced settling time of solids between decants may be the cause. 2012 will see an attempt to maximize settling time between decants in order to minimize TSS levels.

Appendix G
Quality of Waste Water Discharged

pH Results for Eureka Wastewater Lagoon Effluent

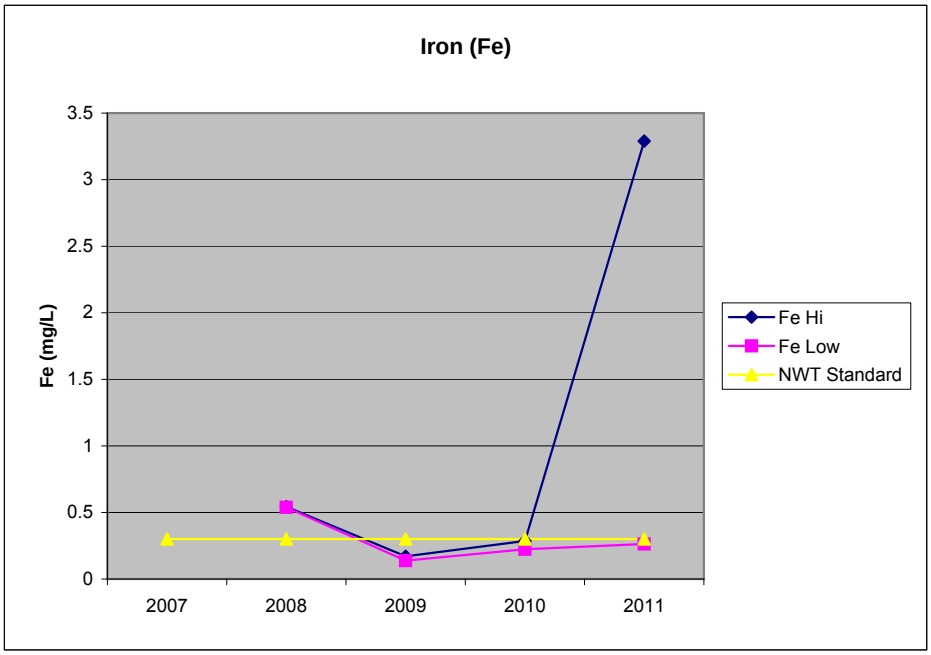


Phosporous Results for Eureka Wastewater Lagoon Effluent



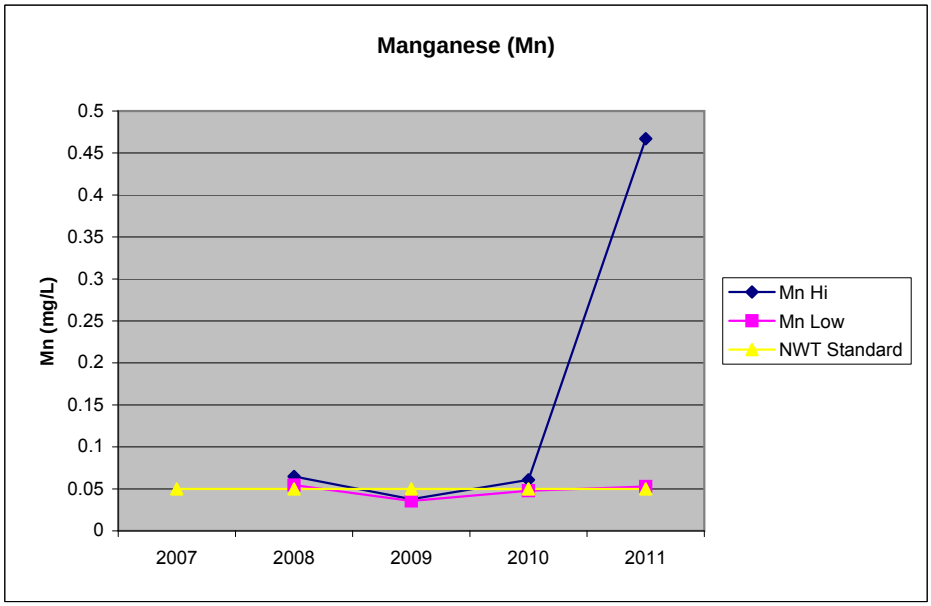
Appendix G
Quality of Waste Water Discharged

Iron Results for Eureka Wastewater Lagoon Effluent



Note: the single high value of 3.29 mg/L on the second decant of 2011 is a single incident anomoly which will be retested in 2012 (perhaps due to sampling error)

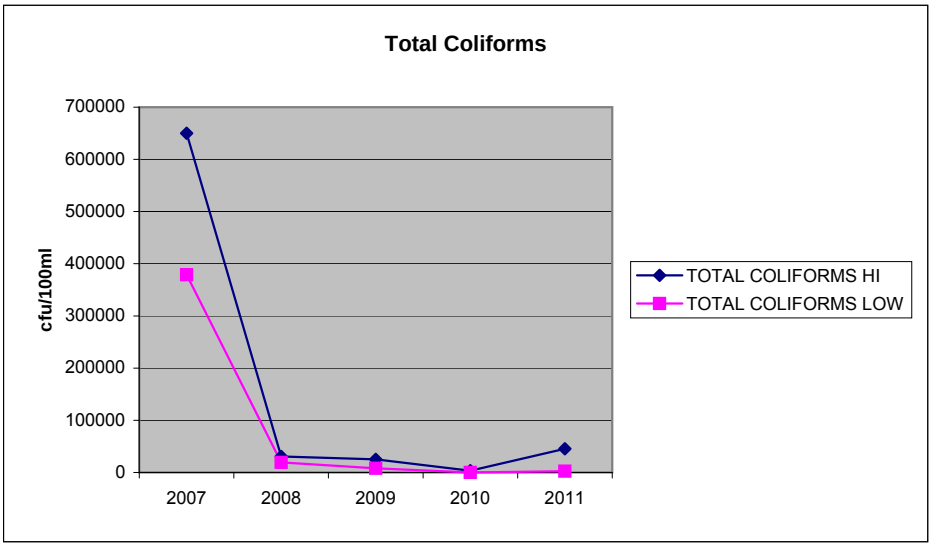
Manganese Results for Eureka Wastewater Lagoon Effluent



Note: the single high value of 0.467 mg/L on the second decant of 2011 is a single incident anomoly which will be retested in 2012 (perhaps due to sampling error)

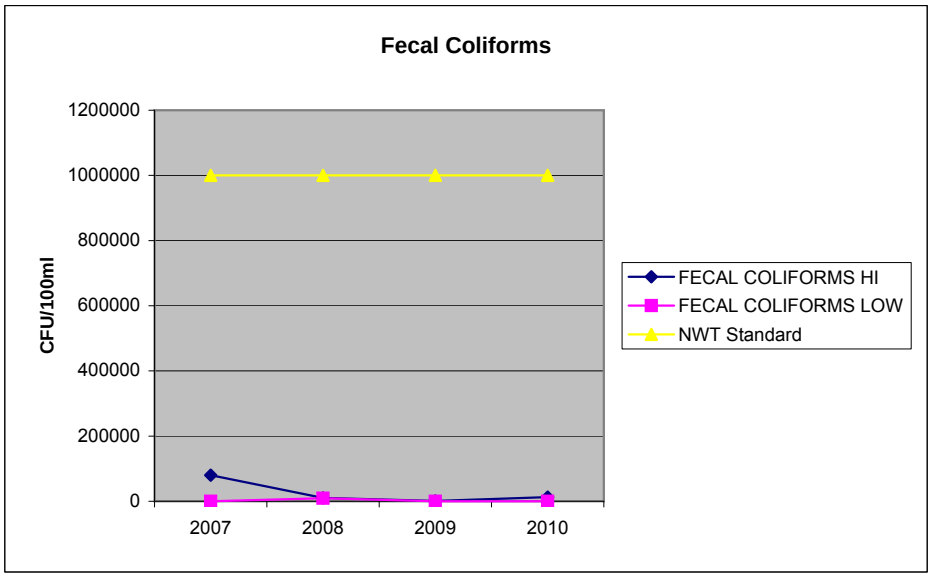
Appendix G
Quality of Waste Water Discharged

Total Coliform Results for Eureka Wastewater Lagoon Effluent



Note: cfu = colony forming units

Fecal Coliform Results for Eureka Wastewater Lagoon Effluent



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

Appendix G
Quality of Waste Water Discharged

EUREKA SEWAGE LAGOON: ANALYSIS RESULTS: 2011 (1st Decant)

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- FINAL REPORT -

Prepared For: Environment Canada
Eureka Weather Station

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

Attn: **Harvey Pukin** **Facsimile:**

Final report has been reviewed and approved by:

Helene Harper

Helene Harper
Manager

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) 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.

Report Date: Monday, July 18, 2011
Print Date: Monday, July 18, 2011

Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-ST-11 **Taiga Sample ID:** 001

Client Project:
Sample Type: Sewage Tank
Received Date: 07-Jul-11
Sampling Date: 07-Jun-11
Sampling Time: 19:00
Location: Eureka Sewage Lagoon
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Conductivity, Specific (@ 25°C)	1410	0.4	µS/cm	07-Jul-11	SM2510:B	
pH	7.10		pH units	07-Jul-11	SM4500-H:B	
Solids, Total Suspended	68	3	mg/L	13-Jul-11	SM2540:D	
Inorganics - Nutrients						
Ammonia as Nitrogen	11.1	0.01	mg/L	12-Jul-11	SM4500-NH3:	
Biochemical Oxygen Demand	129	2	mg/L	08-Jul-11	SM5210:B	6
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	07-Jul-11	SM4110:B	
Phosphorous, Total	4.92	0.01	mg/L	15-Jul-11	SM4500-P:D	
Major Ions						
Calcium	12.3	0.1	mg/L	08-Jul-11	SM4110:B	
Fluoride	0.2	0.1	mg/L	08-Jul-11	SM4110:B	
Magnesium	4.0	0.1	mg/L	08-Jul-11	SM4110:B	
Potassium	11.7	0.1	mg/L	08-Jul-11	SM4110:B	
Sodium	245	0.1	mg/L	08-Jul-11	SM4110:B	

Report Date: Monday, July 18, 2011
Print Date: Monday, July 18, 2011

Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-ST-11 **Taiga Sample ID:** 001

Microbiology						
Coliforms, Fecal	1690000	10000	CFU/100mL	07-Jul-11	SM9222:D	6
Coliforms, Total	10100000	10000	MPN/100mL	07-Jul-11	SM9223:B	6
Organics						
Hexane Extractable Material	24.7	2.0	mg/L	14-Jul-11	EPA1664A	
Oil and Grease, visible	non-visual			08-Jul-11	Visual Exam	
Trace Metals, Total						
Aluminum	86	5	µg/L	15-Jul-11	EPA200.8	
Antimony	0.2	0.1	µg/L	15-Jul-11	EPA200.8	
Arsenic	0.3	0.2	µg/L	15-Jul-11	EPA200.8	
Barium	4.9	0.1	µg/L	15-Jul-11	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8	
Cesium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8	
Chromium	0.7	0.1	µg/L	15-Jul-11	EPA200.8	
Cobalt	0.2	0.1	µg/L	15-Jul-11	EPA200.8	
Copper	110	0.2	µg/L	15-Jul-11	EPA200.8	
Iron	552	5	µg/L	15-Jul-11	EPA200.8	
Lead	1.1	0.1	µg/L	15-Jul-11	EPA200.8	
Lithium	4.1	0.2	µg/L	15-Jul-11	EPA200.8	
Manganese	14.9	0.1	µg/L	15-Jul-11	EPA200.8	
Molybdenum	0.4	0.1	µg/L	15-Jul-11	EPA200.8	
Nickel	2.1	0.1	µg/L	15-Jul-11	EPA200.8	
Rubidium	7.8	0.1	µg/L	15-Jul-11	EPA200.8	

Report Date: Monday, July 18, 2011
Print Date: Monday, July 18, 2011

Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-ST-11 **Taiga Sample ID:** 001

Selenium	0.8	0.3	µg/L	15-Jul-11	EPA200.8
Silver	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Strontium	41.3	0.1	µg/L	15-Jul-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Titanium	7.3	0.1	µg/L	15-Jul-11	EPA200.8
Uranium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Vanadium	0.4	0.1	µg/L	15-Jul-11	EPA200.8
Zinc	118	5	µg/L	15-Jul-11	EPA200.8
Subcontracted Organics					
Phenols, Total	0.027	0.001	mg/L	14-Jul-11	APHA 5530D
Subcontracted Nutrients					
Kjeldahl Nitrogen, Total	47.6	0.06	mg/L	13-Jul-11	ISO 11905-2

Report Date: Monday, July 18, 2011
Print Date: Monday, July 18, 2011

Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-F-11 **Taiga Sample ID:** 002

Client Project:
Sample Type: Wastewater-Full
Received Date: 07-Jul-11
Sampling Date: 07-Jun-11
Sampling Time: 19:00
Location: Eureka Sewage Lagoon
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Conductivity, Specific (@ 25°C)	3830	0.4	µS/cm	07-Jul-11	SM2510:B	
pH	9.70		pH units	07-Jul-11	SM4500-H:B	
Solids, Total Suspended	114	3	mg/L	13-Jul-11	SM2540:D	
Inorganics - Nutrients						
Ammonia as Nitrogen	1.75	0.01	mg/L	12-Jul-11	SM4500-NH3:	
Biochemical Oxygen Demand	46	2	mg/L	08-Jul-11	SM5210:B	6
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	07-Jul-11	SM4110:B	
Phosphorous, Total	2.29	0.01	mg/L	15-Jul-11	SM4500-P:D	
Major Ions						
Calcium	94.1	0.1	mg/L	08-Jul-11	SM4110:B	
Fluoride	0.3	0.1	mg/L	08-Jul-11	SM4110:B	
Magnesium	43.4	0.1	mg/L	08-Jul-11	SM4110:B	
Potassium	15.9	0.1	mg/L	08-Jul-11	SM4110:B	
Sodium	710	0.1	mg/L	08-Jul-11	SM4110:B	

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Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-F-11 **Taiga Sample ID:** 002

Microbiology							
Coliforms, Fecal	< 10	10	CFU/100mL	07-Jul-11	SM9222:D	68	6
Coliforms, Total	98.0	10.0	MPN/100mL	07-Jul-11	SM9223:B		6
Organics							
Hexane Extractable Material	4.5	2.0	mg/L	14-Jul-11	EPA1664A		
Oil and Grease, visible	non-visual			08-Jul-11	Visual Exam		
Trace Metals, Total							
Aluminum	69	5	µg/L	15-Jul-11	EPA200.8		
Antimony	0.3	0.1	µg/L	15-Jul-11	EPA200.8		
Arsenic	0.8	0.2	µg/L	15-Jul-11	EPA200.8		
Barium	17.8	0.1	µg/L	15-Jul-11	EPA200.8		
Beryllium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8		
Cadmium	0.1	0.1	µg/L	15-Jul-11	EPA200.8		
Cesium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8		
Chromium	0.8	0.1	µg/L	15-Jul-11	EPA200.8		
Cobalt	0.9	0.1	µg/L	15-Jul-11	EPA200.8		
Copper	45.5	0.2	µg/L	15-Jul-11	EPA200.8		
Iron	262	5	µg/L	15-Jul-11	EPA200.8		
Lead	0.8	0.1	µg/L	15-Jul-11	EPA200.8		
Lithium	14.0	0.2	µg/L	15-Jul-11	EPA200.8		
Manganese	51.3	0.1	µg/L	15-Jul-11	EPA200.8		
Molybdenum	0.5	0.1	µg/L	15-Jul-11	EPA200.8		
Nickel	5.2	0.1	µg/L	15-Jul-11	EPA200.8		
Rubidium	6.5	0.1	µg/L	15-Jul-11	EPA200.8		

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Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-F-11 **Taiga Sample ID:** 002

Selenium	1.1	0.5	µg/L	15-Jul-11	EPA200.8
Silver	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Strontium	363	0.1	µg/L	15-Jul-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Titanium	0.7	0.1	µg/L	15-Jul-11	EPA200.8
Uranium	0.4	0.1	µg/L	15-Jul-11	EPA200.8
Vanadium	0.5	0.1	µg/L	15-Jul-11	EPA200.8
Zinc	61	5	µg/L	15-Jul-11	EPA200.8
Subcontracted Organics					
Phenols, Total	0.023	0.001	mg/L	14-Jul-11	APHA 5530D
Subcontracted Nutrients					
Kjeldahl Nitrogen, Total	18.9	0.06	mg/L	13-Jul-11	ISO 11905-2

Report Date: Monday, July 18, 2011
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Appendix G
Quality of Waste Water Discharged

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Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-1/2-11 **Taiga Sample ID:** 003

Client Project:
Sample Type: Wastewater-1/2
Received Date: 07-Jul-11
Sampling Date: 07-Jun-11
Sampling Time: 19:00
Location: Eureka Sewage Lagoon
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Conductivity, Specific (@ 25°C)	3880	0.4	µS/cm	07-Jul-11	SM2510:B	
pH	9.80		pH units	07-Jul-11	SM4500-H:B	
Solids, Total Suspended	114	3	mg/L	13-Jul-11	SM2540:D	
Inorganics - Nutrients						
Ammonia as Nitrogen	1.54	0.01	mg/L	12-Jul-11	SM4500-NH3:	
Biochemical Oxygen Demand	49	2	mg/L	08-Jul-11	SM5210:B	6
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	07-Jul-11	SM4110:B	
Phosphorous, Total	2.31	0.01	mg/L	15-Jul-11	SM4500-P:D	
Major Ions						
Calcium	98.6	0.1	mg/L	08-Jul-11	SM4110:B	
Fluoride	0.2	0.1	mg/L	08-Jul-11	SM4110:B	
Magnesium	43.4	0.1	mg/L	08-Jul-11	SM4110:B	
Potassium	15.4	0.1	mg/L	08-Jul-11	SM4110:B	
Sodium	681	0.1	mg/L	08-Jul-11	SM4110:B	

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Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-1/2-11 **Taiga Sample ID:** 003

Microbiology						
Coliforms, Fecal	390	10	CFU/100mL	07-Jul-11	SM9222:D	6
Coliforms, Total	5010	10.0	MPN/100mL	07-Jul-11	SM9223:B	6
Organics						
Hexane Extractable Material	6.8	2.0	mg/L	14-Jul-11	EPA1664A	
Oil and Grease, visible	non-visual			08-Jul-11	Visual Exam	
Trace Metals, Total						
Aluminum	73	5	µg/L	15-Jul-11	EPA200.8	
Antimony	0.3	0.1	µg/L	15-Jul-11	EPA200.8	
Arsenic	0.8	0.2	µg/L	15-Jul-11	EPA200.8	
Barium	18.4	0.1	µg/L	15-Jul-11	EPA200.8	
Beryllium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8	
Cadmium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8	
Cesium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8	
Chromium	0.8	0.1	µg/L	15-Jul-11	EPA200.8	
Cobalt	0.9	0.1	µg/L	15-Jul-11	EPA200.8	
Copper	46.7	0.2	µg/L	15-Jul-11	EPA200.8	
Iron	263	5	µg/L	15-Jul-11	EPA200.8	
Lead	0.7	0.1	µg/L	15-Jul-11	EPA200.8	
Lithium	14.5	0.2	µg/L	15-Jul-11	EPA200.8	
Manganese	54.1	0.1	µg/L	15-Jul-11	EPA200.8	
Molybdenum	0.5	0.1	µg/L	15-Jul-11	EPA200.8	
Nickel	5.7	0.1	µg/L	15-Jul-11	EPA200.8	
Rubidium	6.6	0.1	µg/L	15-Jul-11	EPA200.8	

Report Date: Monday, July 18, 2011
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Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-1/2-11 **Taiga Sample ID:** 003

Selenium	1.1	0.5	µg/L	15-Jul-11	EPA200.8
Silver	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Strontium	378	0.1	µg/L	15-Jul-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	15-Jul-11	EPA200.8
Titanium	0.8	0.1	µg/L	15-Jul-11	EPA200.8
Uranium	0.4	0.1	µg/L	15-Jul-11	EPA200.8
Vanadium	0.5	0.1	µg/L	15-Jul-11	EPA200.8
Zinc	63	5	µg/L	15-Jul-11	EPA200.8
Subcontracted Organics					
Phenols, Total	0.023	0.001	mg/L	14-Jul-11	APHA 5530D
Subcontracted Nutrients					
Kjeldahl Nitrogen, Total	19.1	0.06	mg/L	13-Jul-11	ISO 11905-2

Report Date: Monday, July 18, 2011
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Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110355

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW- 1/2 -11 **Taiga Sample ID:** 003

- DATA QUALIFERS -

Data Qualifier Descriptions:

6 *Sample received above the recommended temperature*

68 *Unable to repeat analysis at lower dilution. Holding time exceeded.*

*** 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

Report Date: Monday, July 18, 2011
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Appendix G
Quality of Waste Water Discharged

EUREKA SEWAGE LAGOON: ANALYSIS RESULTS: 2011 (2nd Decant)

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110641

- FINAL REPORT -

Prepared For: Environment Canada
Eureka Weather Station

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

Attn: **Rai LeCotey** **Facsimile:**

Final report has been reviewed and approved by:

Helene Harper

Helene Harper
Manager

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) 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.

Report Date: Tuesday, September 20, 2011
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Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110641

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-Sept. 11 **Taiga Sample ID:** 001

Client Project:
Sample Type: Wastewater-1/2
Received Date: 08-Sep-11
Sampling Date: 08-Sep-11
Sampling Time: 7:00
Location: Eureka Sewage Lagoon
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Physicals						
Conductivity, Specific (@ 25°C)	8780	0.4	µS/cm	10-Sep-11	SM2510:B	
pH	8.00		pH units	10-Sep-11	SM4500-H:B	
Solids, Total Suspended	285	3	mg/L	15-Sep-11	SM2540:D	
Inorganics - Nutrients						
Ammonia as Nitrogen	0.08	0.01	mg/L	20-Sep-11	SM4500-NH3:	
Biochemical Oxygen Demand	96	2	mg/L	09-Sep-11	SM5210:B	
Nitrate+Nitrite as Nitrogen	0.32	0.01	mg/L	09-Sep-11	SM4110:B	
Phosphorous, Total	4.42	0.01	mg/L	16-Sep-11	SM4500-P:D	
Major Ions						
Calcium	197	0.1	mg/L	09-Sep-11	SM4110:B	
Magnesium	145	0.1	mg/L	09-Sep-11	SM4110:B	
Potassium	38.9	0.1	mg/L	09-Sep-11	SM4110:B	
Sodium	1660	0.1	mg/L	09-Sep-11	SM4110:B	
Sulphate	568	1	mg/L	09-Sep-11	SM4110:B	

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Appendix G
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Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.: 110641

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-Sept. 11 **Taiga Sample ID:** 001

Microbiology					
Coliforms, Fecal	13000	1000	CFU/100mL	08-Sep-11	SM9222:D
Coliforms, Total	45500	1000	MPN/100mL	08-Sep-11	SM9223:B
Organics					
Hexane Extractable Material	< 2.0	2.0	mg/L	12-Sep-11	EPA1664A
Oil and Grease, visible	Non-visible			20-Sep-11	Visual Exam
Trace Metals, Total					
Aluminum	911	5	µg/L	19-Sep-11	EPA200.8
Antimony	1.0	0.1	µg/L	19-Sep-11	EPA200.8
Arsenic	4.9	0.2	µg/L	19-Sep-11	EPA200.8
Barium	31.2	0.1	µg/L	19-Sep-11	EPA200.8
Beryllium	< 0.1	0.1	µg/L	19-Sep-11	EPA200.8
Cadmium	0.23	0.1	µg/L	19-Sep-11	EPA200.8
Cesium	0.2	0.1	µg/L	19-Sep-11	EPA200.8
Chromium	9.6	0.1	µg/L	19-Sep-11	EPA200.8
Cobalt	1.7	0.1	µg/L	19-Sep-11	EPA200.8
Copper	88.1	0.2	µg/L	19-Sep-11	EPA200.8
Iron	3290	5	µg/L	19-Sep-11	EPA200.8
Lead	4.2	0.1	µg/L	19-Sep-11	EPA200.8
Lithium	41.0	0.2	µg/L	19-Sep-11	EPA200.8
Manganese	467	0.1	µg/L	19-Sep-11	EPA200.8
Molybdenum	0.7	0.1	µg/L	19-Sep-11	EPA200.8
Nickel	9.2	0.1	µg/L	19-Sep-11	EPA200.8
Rubidium	13.0	0.1	µg/L	19-Sep-11	EPA200.8

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Appendix G
Quality of Waste Water Discharged

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
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Taiga Batch No.: 110641

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-Sept. 11 **Taiga Sample ID:** 001

Selenium	< 0.5	0.5	µg/L	19-Sep-11	EPA200.8
Silver	< 0.1	0.1	µg/L	19-Sep-11	EPA200.8
Strontium	845	0.1	µg/L	19-Sep-11	EPA200.8
Thallium	< 0.1	0.1	µg/L	19-Sep-11	EPA200.8
Titanium	16.4	0.1	µg/L	19-Sep-11	EPA200.8
Uranium	0.8	0.1	µg/L	19-Sep-11	EPA200.8
Vanadium	4.5	0.1	µg/L	19-Sep-11	EPA200.8
Zinc	95	5	µg/L	19-Sep-11	EPA200.8
Subcontracted Organics					
Cyanide, Total	0.002	0.001	mg/L	14-Sep-11	EPA335.3
Phenols, Total	0.006	0.001	mg/L	14-Sep-11	APHA 5530D
Subcontracted Nutrients					
Kjeldahl Nitrogen, Total	24.4	0.06	mg/L	16-Sep-11	ISO 11905-2

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Appendix G
Quality of Waste Water Discharged

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Taiga Batch No.: 110641

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EU-WW-Sept. 11 **Taiga Sample ID:** 001

* **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

Report Date: Tuesday, September 20, 2011
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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	20
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	50	11
DND Sewage Lagoon	79	59	23	85	50	11

Environment Canada Environnement Canada

INTERIM ABANDONMENT & RESTORATION PLAN

- Eureka High Arctic Weather Station -

In support of the
Nunavut Water Board License
No. 3BC-EUR1116

Prepared by Environment Canada
Assets, Contracting and Environmental Management Directorate (ACEMD)

March 2011

Canada

CONTROL PAGE

On receipt of revisions and/or amendments, the Assets, Contracting and Environmental Management Directorate (ACEMD) shall complete this control page to ensure that the Interim Abandonment & Restoration Plan is always current and consistently reflects the operations and activities taking place on site.

Revision Number	Date Inserted	Description	Signature
1	Dec. 2010	Modified closure planning timelines and included temporary closure SOPs	
2	March 2011	Update to include new 2011Water Licence and addendum as required by licence 3BC-EUR1116 Condition I Section 2	

ADDENDUM 1: EUREKA ACTIVITIES RELATED TO THE LAND FARM, BIOTREATMENT CELL, AND DND RELATED WASTE MATERIALS.

1. Activities Related to the Landfarm;

-The sole activity related to the landfarm is the continued yearly tilling of the topsoil. As recommended by the Franz Environmental Phase III Environmental Site Assessment (ESA), the remedial options for this AEC should be re-evaluated to develop a more effective approach as it does not appear that the PHC impacted soils are being remediated to any significant degree. As the Phase III ESA is complete, Environment Canada is now entering the Remediation Phase of the project which will see the development of the Human Health Risk Assessment, Environmental Risk Assessment, and some further sampling downgradient of the landfarm, beginning in summer of 2012. The development of a holistic approach to all PHC contaminated soil and the development of an overall management strategy of contamination is to commence in 2012.

-There have been no other activites related to this landfarm.

2. Activities Related to the Biotreatment Cell APEC -7 & DND Biotreatment Cell APEC-8 ;

-The sole activity related to the Biotreatment Cell APEC A-7 is the continued yearly tilling of the topsoil, as recommended by the Franz Environmental Phase III Environmental Site Assessment, in order to provide aeration in order to assist the degradation of the hydrocarbons within the soil by the microorganisms present. Yearly samples of the Biotreatment Cell Apec A-7 soil for BTEX and PHCs will be taken, beginning in 2013, for the purpose of statistical trend analysis, in order to assess whether there is a significant change in concentrations over time.

-There have been no activities to date related to the Biotreatment Cell Apec A-8. Franz Environmental does not recommend any further investigation of this APEC A-8 as per the Phase III Environmental Site Assessment Report. The stockpiled contaminated soil will be incorporated into a site-wide remedial action plan for managing PHC impacted soils through the holistic approach to all PHC contaminated soil and the development of an overall management strategy of contamination.

3. Plans for the reclamation of the infrastructure and waste material on site associated with DND;

- DND will be requested to provide an inventory and status of all waste material on site for their locations and infrastructures along with any Abandonment and Restoration Plans concerning this inventory. Once attained, the DND Abandonment and Restoration Plan will be incorporated into that of Environment Canada's Plan.

Appendix F: Responses by EC to inspection report dated July 19th 2011.

The following responses are offered by Environment Canada to the outstanding issues of the INAC inspection report dated July 19th 2011:

Waste Disposal- Sewage Treatment System comments

1. Environment Canada will ensure that Inspector is notified at least 10 days prior to decantation.
2. Environment Canada will ensure that location of proposed lagoon to be conveyed to inspector and NWB once it has been established.
3. New Environment Canada regulations for effluent discharge will come into force and may impact the design and location of any new lagoon. NWB will receive study plans for a new sewage treatment system which are currently underway with AEG consultants.

Solid Waste comments

1. Environment Canada will notify and remind all users of their property on the acceptable disposal procedures for waste materials as described in the Operations and Maintenance Manual for Eureka facilities.
2. Environment Canada has initiated a project for the purchase of a new drum washer/crusher system for the facility along with the required secondary containment systems in order to properly wash and crush the empty barrels. This project will also see the initiation of a contract to have the cleaned and crushed barrels retrograded south to a suitable recycling facility.
3. Environment Canada is now entering the Remediation Phase of the Environmental Assessment project and will begin development of a holistic approach to all PHC contaminated soil and development of an overall management strategy of contamination is to commence in 2012.

Fuel Storage – Waste Oil Storage comments

1. Environment Canada is in the process of purchasing additional secondary containment systems for the barrels stored on the runway apron and for fuel transfer at the PCSP Helicopter refuelling area.
2. Environment Canada has repaired and cleaned up the minor leak in the 3 inch fuel line located at the main tank farm.
3. Environment Canada is investigating the requirements for retrofitting the fuel pipe line from the fuel tank farm to the Generator building in order to remove any penetrations to the fuel tank farm berm walls and to ensure leak detection capability of pipeline that pass under roadway locations.

General Non-Compliance issues noted by inspector:

Environment Canada will address in 2011 the number of issues that have been raised by the Inspector in his report:
The issues are:

- Waste oil filters are to be crushed and removed on sea-lift as hazardous waste
- The inspector requires a 10 day notification of discharge prior to decanting the Lagoon
- The continual practice of emptying, crushing, and burying barrels on site is not an accepted and environmentally friendly practice.