CITY OF PRINCE RUPERT

2015 ANNUAL REPORT ON THE COMMUNITY WATER SYSTEM

This report details the 2015 status of the Prince Rupert water system, providing an overview of the level of servicing, water quality, treatment, and health data associated with the City's water supply.

CITY OF PRINCE RUPERT

2015 ANNUAL REPORT ON THE COMMUNITY WATER SYSTEM

CONTENTS

IN 2015 THE CITY...

SUPPLIED POTABLE WATER TO OVER 13,500 RESIDENTS, AND CONNECTIONS TO OVER 6,000 HOMES AND BUSINESSES

RESPONDED TO OVER 400 CALLS TO LOCATE SERVICES

RESPONDED TO 15 WATER MAIN ISSUES, INCLUDING WATER MAIN BREAKS

RESPONDED TO 203 WATER SERVICE ISSUES INCLUDING REPAIRS AND BREAKS

The following Annual Report details the 2015 status of the Prince Rupert water system, providing an overview of the level of servicing, water quality, treatment, and health data associated with the City's water supply.

HISTORY OF PRINCE RUPERT'S WATER SYSTEM

When the City was established, the Prince Rupert Water Utility began with just two small dams on Kaien Island. However, these were unacceptable for the longer term and by 1914, the City had secured a much more reliable source of raw water-- two large lakes and watersheds on the Tsimshian Peninsula. Unfortunately, the elevation of Shawatlans Lake was lower than much of Kaien Island, necessitating the construction of a large pump house at the shoreside intake. The new pumping system pushed the water through an undersea or sub-marine supply main across Fern Passage to the Kaien Island townsite where booster pumps moved it on to the Acropolis Reservoir in the City's west end.

Ultimately, the large diameter penstock line from the former BC Hydro Utility dam at Woodworth Lake, higher up in the Coastal Mountain Range, would be extended and form the backbone of a gravity water supply system, leaving the Shawatlans pumping system as a valuable back-up facility to be used in case of emergency or necessary maintenance activity. However, it was 1996 before key infrastructure improvements finally allowed Woodworth Lake to totally fulfill all of Prince Rupert's potable water and fire protection needs. After over 80 years of continual pumping, the City was finally able to switch to a full gravity-fed supply system, eliminating substantial annual hydro electric costs.

WATER SYSTEM DESCRIPTION

Today, the Prince Rupert water system feeds approximately 6 million cubic metres of potable water per year to local residents, businesses, and industry, utilizing over 50 kilometres of distribution line and close to 6000 individual service connections. The system is also capable of meeting the peak seasonal demand of a number of industrial fish processors, an industry that has declined in recent years, but when active can generate over twice the average daily consumption.

WATER QUALITY

Few issues are more important to a municipality than the quality of the drinking water it delivers. It has consequently been Prince Rupert's extreme good fortune to have always had one of the best protected raw water sources in British Columbia. In order to prevent human contamination of the water supply, the City of Prince Rupert maintains restricted access to the watersheds surrounding both Woodworth and Shawatlans Lakes. As noted in the B.C. Auditor General's Report, which reviewed our water protection practices, water source protection is by far the easiest, least expensive, and most practical approach to ensuring the long term safety of the water supply.

Additionally, as a second barrier of defence against the incidence of waterborne disease, the municipality maintains an enduring chlorine residual throughout the water distribution system. Chlorine is the most reliable and widely used drinking water disinfectant in North America. A "residual" is the trace amount of chlorine left in the drinking water after initial disinfection have taken place. As long as a trace of chlorine or residual can be detected, the line is still subject to active disinfection. For greater public safety and adequate contact time, chlorine is added before the water reaches Kaien Island. Chlorine dosage must be constantly trimmed and balanced to maximize disinfection but minimize the

production of potentially harmful disinfection by-products (DBPs), particularly Trihalomethanes (THMs). Residual levels are therefore electronically monitored on a constant basis throughout the municipality. To further check that the chlorination process is working properly and that the water system has not been otherwise compromised, various types of water quality samples are taken daily, weekly, or at other regular intervals. The results of the Water Quality Testing Program are reported to the Provincial Ministry of Health and are available on the Northern Health Authority's Public Health Protection website.

This public site lists the following up-to-date information about our water quality monitoring program:

- **Drinking Water inspection Reports**
- **Current Water Notices** - None are in place for Prince Rupert which has a hazard rating of "Low" (optimal) and there is no record of a water notice or advisory ever being issued for our water system.
- **Chemical Samples & Results** – Actual chemical analysis test results for 8 key sampling points going back as far as 1989.
- **Water Sample Results** – Actual bacteriological test results for selected sampling points dating back to 1994. "L1" means "less than one" or no coliform issues detected.

In the unlikely event of an actual drinking water quality concern or emergency, a Water Quality Advisory, Boil Water Notice, or Do Not Use Water Notice would be issued by the Northern Health Authority. This notice would be placed on the home page of this website as part of a larger media and public notification effort. For further information see the section below regarding "Emergency Planning".

Water Quality Data

Test results are established through the Guidelines for Canadian Drinking Water Quality and the British Columbia Safe Drinking Water Regulation. These result criteria are:

- No one sample should contain more than one Total Coliform per 100ml. There is to be zero E.Coli per 100ml.
- There should be no two consecutive positive samples from the same sample site location that show the presence of coliform indicators; and,
- 90% of all samples must have zero Total Coliforms per 100ml sample

The City of Prince Rupert's Community Water System had facility inspections at five intervals in 2015, producing 5 Sample Range Reports that are available online.

- The total number of potential sampling sites in Prince Rupert is 10 -- 280 samples total were taken during 2015. Sampling sites are listed online.
- There were 0 samples containing e. coli.
- The CWS was well within the acceptable range for Total Coliforms, with 99% of all samples having zero Total Coliforms per 100ml sample.

Source: For a complete list of Water Quality Data obtained from www.healthspace.ca/nha

Chemical Composition of Community Water Supply

The testing results regarding the chemical composition of the CWS are listed below. Water quality meets all known non-aesthetic objectives. The most noticeable physical property of Prince Rupert's potable water is color. It is noted that there is a greater TCU amount for Prince Rupert's water colour

than is ideal according to regulatory standards. While this has a measurable aesthetic value, there is no impact on human health.

Additionally, the pH levels of the CWS hover at or just below the lower limit of the identified goals for pH levels between 6.5 and 8.5. This is due to the City's above ground water supply sources, which are subject to slight acidification from rain, as experience by most coastal communities.

Fluoride is not presently added to Prince Rupert's potable water. The injection system is currently off-line, awaiting sufficient funding for upgrading and replacement.

Source: Complete list of Water Quality Data obtained from www.healthspace.ca/nha

Water testing schedules are available upon request.

EMERGENCY PLANNING:

While water system reliability is absolutely essential, all public water systems can be the victims of various types of emergencies from either natural or man-made causes. Some potential emergencies can be averted or have their impact greatly minimized by advance preparation and sound infrastructure planning. These activities reflect the importance of the water system in sustaining a safe and healthy community. Key to emergency planning is the recognition of the need for a certain amount of redundancy in both physical and human resources.

Prince Rupert is extremely fortunate to have two operational water sources – Shawatlans and Woodworth Lakes. In 2009, Prince Rupert's main water source was cut off for a considerable time period when the pipeline from Woodworth Lake was heavily damaged by a landslide. In many communities, this would certainly have qualified as a disaster. In this case however, the Public Works department was able to quickly switch over to the Shawatlans Lake water source and utilize the pumping system already in place. That system has double power-source redundancy, with hydro power backed up by both diesel-powered engines.

In the case of any serious emergency, the Prince Rupert Public Works Department works hand-in-hand with all other City departments, local Emergency Services, the Provincial Emergency Program (PEP), the Provincial Ministry of Health through the Northern Health Authority, and other utilities and organizations as required. Additionally, City Council would be informed in a timely manner regarding all pertinent aspects of the problem as will the general public through this website and all other available media.

SYSTEM IMPROVEMENTS COMPLETED AND PLANNED:

In 2015, the City applied for matching grants from senior government to replace the raw-water supply line, which is in poor condition, and construct a new access road. The new access road will provide the opportunity to upgrade or replace the dam, which will be the City's next priority for improvement. The upstream termination of the access road is currently approximately 150 m downstream of the existing dam.

Full replacement of the Woodworth Dam and extension of the access road to the dam provides a number of advantages, including:

- Improved ability to access the dam for operation, maintenance and surveillance;
- A significantly longer design life than the rehabilitated existing Woodworth Dam, which may require high repair costs or replacement in the future.
- Improved access for emergency response.
- Elimination of existing concrete and abutment deficiencies.
- Updated spillway capacity.
- Improved debris removal capability.
- Opportunity to install improved communications systems.
- Accessibility across the top of the dam for maintenance, inspection and future repairs.
- Erosion control to the downstream side of the spillway based on the design of a long spillway

The next priority once the dam itself is replaced will be to replace the submarine water mains going under Fern Passage. Provincial and Federal grants will be sought in order to complete these projects and secure these vital elements of the City's water system.

Again, the principle of redundancy is key to responsible emergency preparedness. Local water charges reflect the cost of ensuring an appropriate level of reliability and safety, as well as the logistics involved in the delivery of fresh water from "Lake-to-Tap".

REMEDIAL ACTIONS OR ASSESSMENTS UNDERTAKEN, WHERE APPLICABLE

No major operational challenges were encountered in 2015 that affected water quality and there are no construction-related impacts, remedial actions or assessments to our water system at this time.

COMPLIANCE WITH OPERATING PERMIT REQUIREMENTS

The City is in compliance with all Operating Permit Requirements.

For Additional Information:

Contact:

Garin Gardiner, Operations Manager

(250) 624 6795

garin.gardiner@princerupert.ca

For more information regarding water quality standards, the following links may be of interest:

Northern Health website: http://www.healthspace.ca/nha

Guidelines for Canadian Drinking Water Quality: http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php

For a record of actual rainfall events please navigate to the City Hall Weather Station

SUMMARY

The City of Prince Rupert is currently prioritizing the replacement of aged water supply infrastructure located across the harbour at the dam site. Greater security and water quality certainty will be achieved through burying the water supply line, currently subject to falling trees and landslides. Additionally, an access road will permit quality checks in all weather conditions, and ease of access in case of any incident or emergency. The eventual goal for the City is the full replacement of water supply infrastructure – including the dam and submarine lines.

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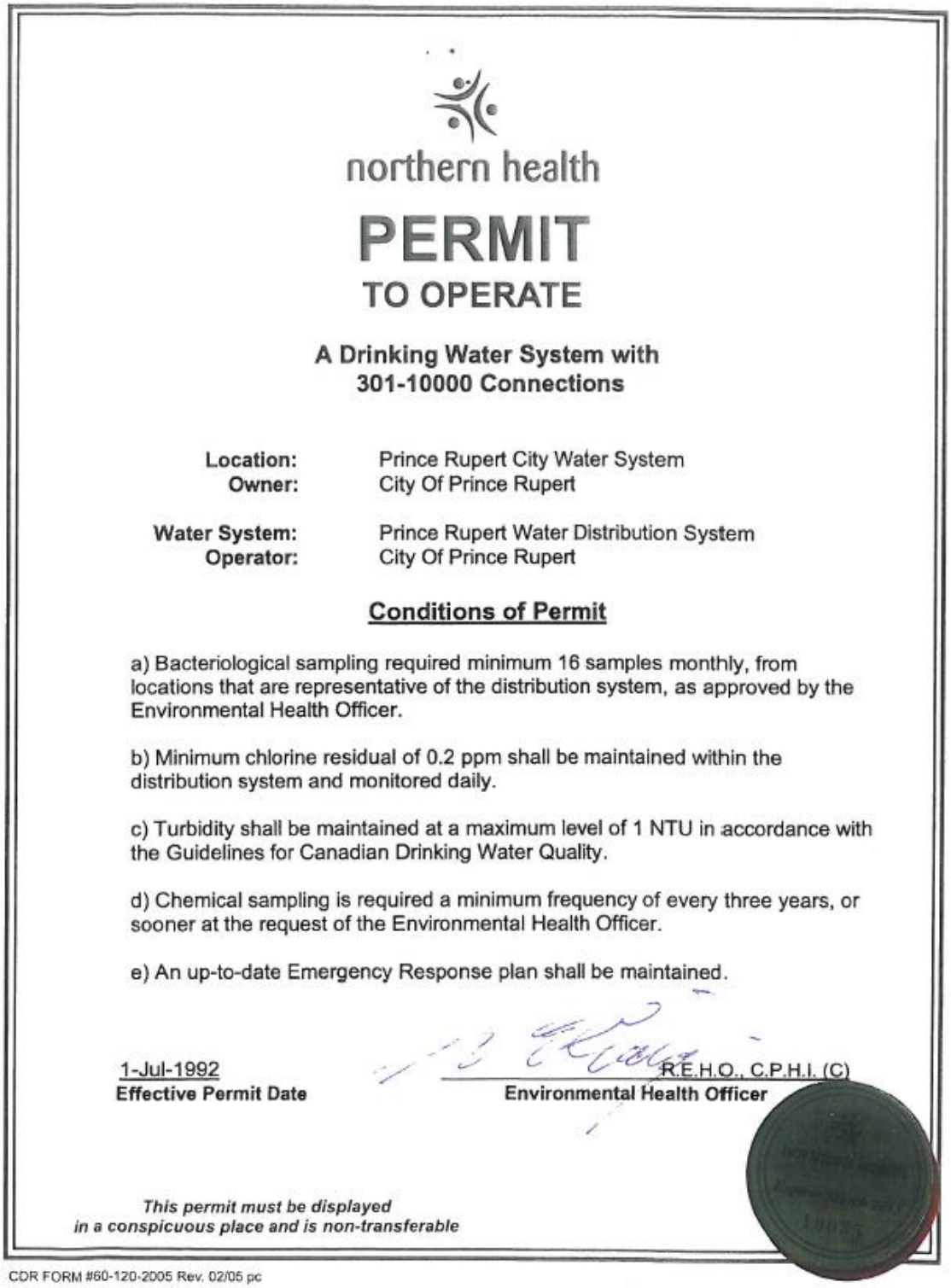
APPENDICES:

APPENDIX A: 2015 Schedule for Water Testing

2015 Schedule for Water Quality Testing			
Metals / Organics	**THM's**	**HAA's**	**Crypto / Giardia**
(All 5 Stations)	**(Fred/M.C./S.D.B./Pills)**	**(Pillsbury)**	**(Shawatlans)**
February-15	February-15	March-15	April-15
July-15	May-15	June-15	October-15
	July-15	August-15	
	October-15	November-15	

APPENDIX B: OPERATING PERMIT



northern health

PERMIT
TO OPERATE

A Drinking Water System with 301-10000 Connections

Location: Prince Rupert City Water System
Owner: City Of Prince Rupert

Water System: Prince Rupert Water Distribution System
Operator: City Of Prince Rupert

Conditions of Permit

a) Bacteriological sampling required minimum 16 samples monthly, from locations that are representative of the distribution system, as approved by the Environmental Health Officer.

b) Minimum chlorine residual of 0.2 ppm shall be maintained within the distribution system and monitored daily.

c) Turbidity shall be maintained at a maximum level of 1 NTU in accordance with the Guidelines for Canadian Drinking Water Quality.

d) Chemical sampling is required a minimum frequency of every three years, or sooner at the request of the Environmental Health Officer.

e) An up-to-date Emergency Response plan shall be maintained.

1-Jul-1992
Effective Permit Date

R.E.H.O., C.P.H.I. (C)
Environmental Health Officer

This permit must be displayed in a conspicuous place and is non-transferable

CDR FORM #60-120-2005 Rev. 02/05 pc

APPENDIX B: Lab Test Results

See following pages.

norlabs
Northern Laboratories (2010) Ltd.

ANALYSIS FINAL REPORT

Report to: City of Prince Rupert
424 3rd Avenue West
Prince Rupert, BC V8J 1L7
Fax (250) 624-5410
water@princerupert.ca
garin.gardiner@princerupert.ca
rob.corbeil@princerupert.ca
mseidel@princerupert.ca
richard.pucci@princerupert.ca

Lab reference: 150348

Date received: January 21, 2015

Date reported: January 22, 2015

Methodology:

All tests were done in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Results:

Sample Site		Total coliforms *MPN/100 mL*	*E. coli* *MPN/100 mL*
Frederick Stn	Jan 21/15 12:40	ND	ND
Sourdough Bay Stn	Jan 21/15 13:10	ND	ND
Montreal Circle Reservoir	Jan 21/15 12:55	ND	ND
Pillsbury Stn	Jan 21/15 13:40	ND	ND
DWG		***ND***	***ND***
MDL		***1***	***1***

DWG = Drinking water guidelines ***MDL = Method detection limit***
MPN = Most probable number ***ND = Less than MDL***

Comment:

These water samples are bacteriologically safe for drinking, according to Health Canada's guidelines.

Approved by: Jesse Newton, B.Sc.
Lab Manager

ANALYSIS FINAL REPORT

Report to: City of Prince Rupert
424 3rd Avenue West
Prince Rupert, BC V8J 1L7
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rob.corbeil@princerupert.ca
mseidel@princerupert.ca
richard.pucci@princerupert.ca

Lab reference: 151445

Date received: March 25, 2015

Date reported: April 10, 2015

Methodology:

All tests were done in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Results:

Parameter	*Units*	Pillsbury Station Mar 25/15 13:07	*DWG*	*MDL*
Haloacetic acids				
Monochloroacetic Acid	*µg/L*	ND	-	*2*
Monobromoacetic Acid	*µg/L*	ND	-	*2*
Dichloroacetic Acid	*µg/L*	*69*	-	*2*
Trichloroacetic Acid	*µg/L*	85	-	*2*
Dibromoacetic Acid	*µg/L*	ND	-	*2*
Total Haloacetic acids	*µg/L*	**154**	*80*	*2*

DWG = Drinking water guidelines
MDL = Method detection limit
ND = Less than MDL

Approved by: Jesse Newton, B.Sc.
Lab Manager

norlabs
Northern Laboratories (2010) Ltd.

ANALYSIS FINAL REPORT

Report to: City of Prince Rupert
424 3rd Avenue West
Prince Rupert, BC V8J 1L7
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water@princerupert.ca
garin.gardiner@princerupert.ca
rob.corbeil@princerupert.ca
mseidel@princerupert.ca
richard.pucci@princerupert.ca

Lab reference: 151162

Date received: March 10, 2015

Date reported: March 26, 2015

Methodology:

All tests were done in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Metals were determined in a sample aliquot which was acid-preserved and analyzed by ICP-MS.

Comment(s):

All metal levels tested are below Health Canada's health or aesthetic guidelines.

The pH level is outside the Aesthetic Objective range in Health Canada's guidelines of 6.5 - 8.5.

The level of colour exceeds the Aesthetic Objective in Health Canada's guidelines. Some consumers may find the colour to be unacceptably high.

Approved by: Jesse Newton, B.Sc.
Lab Manager

norlabs
Northern Laboratories (2010) Ltd.

Lab reference: 151162

Sample ID: Date: Time:			**Frederick Stn** **Mar 10/2015** **13:05**	**Montreal Circle** **Mar 10/2015** **13:19**	**Sourdough Bay** **Mar 10/2015** **13:35**	
Parameter	***Units***	***DWG***				***MDL***
Total Aluminum (Al)	*mg/L*	*(0.2)*	0.101	0.102	0.100	*0.005*
Total Antimony (Sb)	*mg/L*	*0.006*	0.0001	ND	ND	*0.0001*
Total Arsenic (As)	*mg/L*	*0.010*	ND	ND	ND	*0.0005*
Total Barium (Ba)	*mg/L*	*1.0*	0.007	0.007	0.007	*0.005*
Total Beryllium (Be)	*mg/L*	-	ND	ND	ND	*0.0001*
Total Bismuth (Bi)	*mg/L*	-	ND	ND	ND	*0.0001*
Total Boron (B)	*mg/L*	*5*	0.024	0.016	0.009	*0.004*
Total Cadmium (Cd)	*mg/L*	*0.005*	ND	0.00002	ND	*0.00001*
Total Calcium (Ca)	*mg/L*	-	3.2	3.5	3.3	*0.2*
Total Chromium (Cr)	*mg/L*	*0.05*	ND	ND	ND	*0.0005*
Total Cobalt (Co)	*mg/L*	-	0.00005	ND	ND	*0.00005*
Total Copper (Cu)	*mg/L*	*(1.0)*	0.0353	0.0401	0.0290	*0.0002*
Total Iron (Fe)	*mg/L*	*(0.3)*	0.15	0.16	0.15	*0.01*
Total Lead (Pb)	*mg/L*	*0.010*	0.0002	0.0002	0.0004	*0.0001*
Total Lithium (Li)	*mg/L*	-	0.0002	0.0003	0.0002	*0.0001*
Total Magnesium (Mg)	*mg/L*	-	0.31	0.31	0.31	*0.01*
Total Manganese (Mn)	*mg/L*	*(0.05)*	0.0042	0.0045	0.0036	*0.0002*
Total Mercury (Hg)	*mg/L*	*0.001*	ND	ND	ND	*0.00002*
Total Molybdenum (Mo)	*mg/L*	-	0.0002	0.0002	0.0002	*0.0001*
Total Nickel (Ni)	*mg/L*	-	ND	0.0002	0.0003	*0.0002*
Total Phosphorus (P)	*mg/L*	-	ND	ND	ND	*0.02*
Total Potassium (K)	*mg/L*	-	0.35	0.36	0.36	*0.02*
Total Selenium (Se)	*mg/L*	*0.01*	ND	ND	ND	*0.0005*
Total Silicon (Si)	*mg/L*	-	1.1	1.1	1.1	*0.5*
Total Silver (Ag)	*mg/L*	-	ND	ND	ND	*0.00005*
Total Sodium (Na)	*mg/L*	*(200)*	0.99	0.99	0.99	*0.02*
Total Strontium (Sr)	*mg/L*	-	0.012	0.013	0.013	*0.001*
Total Sulfur (S)	*mg/L*	-	ND	ND	ND	*1*
Total Tellurium (Te)	*mg/L*	-	ND	ND	ND	*0.0002*
Total Thallium (Tl)	*mg/L*	-	ND	ND	ND	*0.00002*
Total Thorium (Th)	*mg/L*	-	ND	ND	ND	*0.0001*
Total Tin (Sn)	*mg/L*	-	ND	ND	ND	*0.0002*
Total Titanium (Ti)	*mg/L*	-	ND	ND	ND	*0.005*
Total Uranium (U)	*mg/L*	*0.02*	ND	ND	ND	*0.00002*
Total Vanadium (V)	*mg/L*	-	ND	ND	ND	*0.001*
Total Zinc (Zn)	*mg/L*	*(5)*	0.004	0.004	ND	*0.004*
Total Zirconium (Zr)	*mg/L*	-	ND	ND	ND	*0.0001*

DWG = BC or Canadian drinking water guidelines
( ) = indicates DWG limit is aesthetic, ie not health-related
MDL = Method detection limit
ND = less than the method detection limit indicated

norlabs
Northern Laboratories (2010) Ltd.

Lab reference: 151162

Sample ID: Date: Time:			**Pillsbury** **Mar 10/2015** **13:53**	**Shawatlands** **Mar 10/2015** **15:11**	
Parameter	***Units***	***DWG***			***MDL***
Total Aluminum (Al)	*mg/L*	*(0.2)*	0.114	0.099	*0.005*
Total Antimony (Sb)	*mg/L*	*0.006*	ND	ND	*0.0001*
Total Arsenic (As)	*mg/L*	*0.010*	ND	ND	*0.0005*
Total Barium (Ba)	*mg/L*	*1.0*	0.007	0.007	*0.005*
Total Beryllium (Be)	*mg/L*	-	ND	ND	*0.0001*
Total Bismuth (Bi)	*mg/L*	-	ND	ND	*0.0001*
Total Boron (B)	*mg/L*	*5*	0.007	0.006	*0.004*
Total Cadmium (Cd)	*mg/L*	*0.005*	0.00001	0.00001	*0.00001*
Total Calcium (Ca)	*mg/L*	-	3.1	3.1	*0.2*
Total Chromium (Cr)	*mg/L*	*0.05*	ND	ND	*0.0005*
Total Cobalt (Co)	*mg/L*	-	0.00008	ND	*0.00005*
Total Copper (Cu)	*mg/L*	*(1.0)*	0.0547	0.0029	*0.0002*
Total Iron (Fe)	*mg/L*	*(0.3)*	0.24	0.17	*0.01*
Total Lead (Pb)	*mg/L*	*0.010*	0.0003	ND	*0.0001*
Total Lithium (Li)	*mg/L*	-	0.0002	0.0002	*0.0001*
Total Magnesium (Mg)	*mg/L*	-	0.30	0.30	*0.01*
Total Manganese (Mn)	*mg/L*	*(0.05)*	0.0082	0.0051	*0.0002*
Total Mercury (Hg)	*mg/L*	*0.001*	ND	ND	*0.00002*
Total Molybdenum (Mo)	*mg/L*	-	0.0004	0.0002	*0.0001*
Total Nickel (Ni)	*mg/L*	-	0.0002	0.0002	*0.0002*
Total Phosphorus (P)	*mg/L*	-	ND	ND	*0.02*
Total Potassium (K)	*mg/L*	-	0.36	0.35	*0.02*
Total Selenium (Se)	*mg/L*	*0.01*	ND	ND	*0.0005*
Total Silicon (Si)	*mg/L*	-	1.1	1.1	*0.5*
Total Silver (Ag)	*mg/L*	-	ND	ND	*0.00005*
Total Sodium (Na)	*mg/L*	*(200)*	0.97	0.94	*0.02*
Total Strontium (Sr)	*mg/L*	-	0.013	0.012	*0.001*
Total Sulfur (S)	*mg/L*	-	ND	ND	*1*
Total Tellurium (Te)	*mg/L*	-	ND	ND	*0.0002*
Total Thallium (Tl)	*mg/L*	-	ND	ND	*0.00002*
Total Thorium (Th)	*mg/L*	-	ND	ND	*0.0001*
Total Tin (Sn)	*mg/L*	-	ND	ND	*0.0002*
Total Titanium (Ti)	*mg/L*	-	ND	ND	*0.005*
Total Uranium (U)	*mg/L*	*0.02*	ND	ND	*0.00002*
Total Vanadium (V)	*mg/L*	-	ND	ND	*0.001*
Total Zinc (Zn)	*mg/L*	*(5)*	ND	ND	*0.004*
Total Zirconium (Zr)	*mg/L*	-	ND	ND	*0.0001*

DWG = BC or Canadian drinking water guidelines
( ) = indicates DWG limit is aesthetic, ie not health-related
MDL = Method detection limit
ND = less than the method detection limit indicated

norlabs
Northern Laboratories (2010) Ltd.

Lab reference: 151162

Sample ID: Date: Time:			**Frederick Stn** **Mar 10/2015** **13:05**	**Montreal Circle** **Mar 10/2015** **13:19**	**Sourdough Bay** **Mar 10/2015** **13:35**	
Parameter	***Units***	***DWG***				***MDL***
pH	-	*(6.5 - 8.5)*	**6.3**	**6.2**	**6.1**	-
Conductivity	*uS/cm*	-	26.7	19.6	27.2	*1*
Total Alkalinity (CaCO3)	*mg/L*	-	4.6	4.5	5.0	*1*
Total Hardness (CaCO3)	*mg/L*	*(500)*	9.3	10.0	9.5	*0.5*
Turbidity	*NTU*	*1*	0.50	0.53	0.43	*0.05*
Total Dissolved Solids	*mg/L*	*(500)*	13.0	22.0	23.0	*1*
True Colour	*PtCo units*	*(15)*	**20**	**18**	**19**	*1*
Fluoride (F)	*mg/L*	*1.5*	ND	ND	ND	*0.10*
Chloride (Cl)	*mg/L*	*(250)*	3.7	3.6	3.9	*1*
Sulfate (SO4)	*mg/L*	*(500)*	1.5	1.4	1.4	*1.0*
Nitrate (N)	*mg/L*	*10*	ND	ND	ND	*0.1*
Nitrite (N)	*mg/L*	*1*	ND	ND	ND	*0.01*
Total organic carbon (C)	*mg/L*	-	4.3	4.1	3.9	*0.5*
Langelier Saturation Index	-	-	-4.7	-4.8	-4.9	-
Trihalomethanes						
Bromodichloromethane	*ug/L*	-	ND	ND	ND	*1.0*
Bromoform	*ug/L*	-	ND	ND	ND	*1.0*
Chloroform	*ug/L*	-	10.0	20.0	31.0	*1.0*
Dibromochloromethane	*ug/L*	-	ND	ND	ND	*1.0*
Total Trihalomethanes	*ug/L*	*100*	10.0	20.0	31.0	*1.0*

DWG = BC or Canadian drinking water guidelines
( ) = indicates DWG limit is aesthetic, ie not health-related
MDL = Method detection limit
ND = less than the method detection limit indicated
NTU = Nephelometric turbidity units

norlabs
Northern Laboratories (2010) Ltd.

Lab reference: 151162

Sample ID: Date: Time:			**Pillsbury** **Mar 10/2015** **13:53**	**Shawatlands** **Mar 10/2015** **15:11**	
Parameter	***Units***	***DWG***			***MDL***
pH	-	*(6.5 - 8.5)*	**6.1**	6.7	-
Conductivity	*uS/cm*	-	19.6	17.3	*1*
Total Alkalinity (CaCO3)	*mg/L*	-	4.5	8.2	*1*
Total Hardness (CaCO3)	*mg/L*	*(500)*	9.0	9.0	*0.5*
Turbidity	*NTU*	*1*	0.88	0.48	*0.05*
Total Dissolved Solids	*mg/L*	*(500)*	24.0	25.0	*1*
True Colour	*PtCo units*	*(15)*	**19**	**38**	*1*
Fluoride (F)	*mg/L*	*1.5*	ND	ND	*0.10*
Chloride (Cl)	*mg/L*	*(250)*	3.8	1.6	*1*
Sulfate (SO4)	*mg/L*	*(500)*	1.4	1.5	*1.0*
Nitrate (N)	*mg/L*	*10*	ND	ND	*0.1*
Nitrite (N)	*mg/L*	*1*	ND	ND	*0.01*
Total organic carbon (C)	*mg/L*	-	4.0	4.0	*0.5*
Langelier Saturation Index	-	-	-5.0	-4.1	-
Trihalomethanes					
Bromodichloromethane	*ug/L*	-	ND	-	*1.0*
Bromoform	*ug/L*	-	ND	-	*1.0*
Chloroform	*ug/L*	-	31.0	-	*1.0*
Dibromochloromethane	*ug/L*	-	ND	-	*1.0*
Total Trihalomethanes	*ug/L*	*100*	31.0	**-**	*1.0*

DWG = BC or Canadian drinking water guidelines
( ) = indicates DWG limit is aesthetic, ie not health-related
MDL = Method detection limit
ND = less than the method detection limit indicated
NTU = Nephelometric turbidity units

ANALYTICAL REPORT

City of Prince Rupert	Project: Drinking Water
424 3rd Avenue West	Project Number: -
Prince Rupert, BC V8J 1L7	Project Manager: Public Works Department
water@princerupert.ca	
Work Order: N509266	
RECEIVED: 30-Sep-15	**REPORTED:** 21-Oct-15 09:46

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

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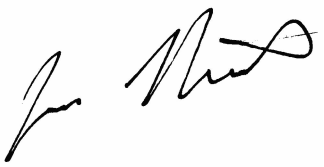

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N509266

LAB #				**N509266-01**
SAMPLED DATE				**30-Sep-15**
SAMPLED TIME				**10:58**
SAMPLE ID				**Montreal Circle Reservoir**
	MRL	***Units***	***CDWG***	
Bacteriological Parameters (Water)				
Total Coliforms	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1
E. coli	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1

Bacteriological Parameters Comments

Lab Number **N509266-01** (Sample ID: "**Montreal Circle Reservoir**") contained **<1 Total Coliforms** and **E. coli** per 100mL. Based soley on these results this water sample is bacteriologically safe for drinking, according to Health Canada's guidelines.

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
MAC	Maximum Acceptable Concentration
AO	Aestetic Objective (not health related)
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

ANALYTICAL REPORT

City of Prince Rupert	Project: Drinking Water
424 3rd Avenue West	Project Number: -
Prince Rupert BC, V8J 1L7	Project Manager: Public Works Department
water@princerupert.ca	
Work Order: N509103	
RECEIVED: 11-Sep-15	**REPORTED:** 14-Sep-15 10:59

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

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Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N509103

LAB #				**N509103-01**	**N509103-02**	**N509103-03**	**N509103-04**
SAMPLED DATE				**11-Sep-15**	**11-Sep-15**	**11-Sep-15**	**11-Sep-15**
SAMPLED TIME				**09:05**	**09:58**	**10:40**	**10:15**
SAMPLE ID				**Park Ave Flushing Station**	**Graham Ave**	**Pillsbury Station**	**BC Ferries**
	MRL	***Units***	***CDWG***				
Bacteriological Parameters (Water)							
Total Coliforms	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1	<1	<1	<1
E. coli	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1	<1	<1	<1
Field Data (Water)							
Chlorinie Residual (field)	*0.01*	*mg/L*	-	**0.52**	**0.49**	**0.59**	**0.48**

Bacteriological Parameters Comments

Lab Number **N509103-01** (Sample ID: "**Park Ave Flushing Station**") contained **<1 Total Coliforms** and **E. coli** per 100mL. Based soley on these results this water sample is bacteriologically safe for drinking, according to Health Canada's guidelines.

Lab Number **N509103-02** (Sample ID: "**Graham Ave**") contained **<1 Total Coliforms** and **E. coli** per 100mL. Based soley on these results this water sample is bacteriologically safe for drinking, according to Health Canada's guidelines.

Lab Number **N509103-03** (Sample ID: "**Pillsbury Station**") contained **<1 Total Coliforms** and **E. coli** per 100mL. Based soley on these results this water sample is bacteriologically safe for drinking, according to Health Canada's guidelines.

Lab Number **N509103-04** (Sample ID: "**BC Ferries**") contained **<1 Total Coliforms** and **E. coli** per 100mL. Based soley on these results this water sample is bacteriologically safe for drinking, according to Health Canada's guidelines.

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
mg/L	Milligrams per Litre
MAC	Maximum Acceptable Concentration
AO	Aestetic Objective (not health related)
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

ANALYTICAL REPORT

City of Prince Rupert	Project: Drinking Water
424 3rd Avenue West	Project Number: -
Prince Rupert BC, V8J 1L7	Project Manager: Public Works Department
water@princerupert.ca	
Work Order: N509094	
RECEIVED: 10-Sep-15	**REPORTED:** 11-Sep-15 16:50

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

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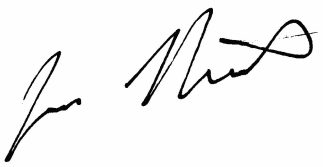

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N509094

LAB #				**N509094-01**
SAMPLED DATE				**10-Sep-15**
SAMPLED TIME				**10:20**
SAMPLE ID				**Park Ave Flushing Station**
	MRL	***Units***	***CDWG***	
Bacteriological Parameters (Water)				
Total Coliforms	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1
E. coli	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
MAC	Maximum Acceptable Concentration
AO	Aestetic Objective (not health related)
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

ANALYTICAL REPORT

City of Prince Rupert
424 3rd Avenue West
Prince Rupert BC, V8J 1L7
water@princerupert.ca

Project: Drinking Water
Project Number: -
Project Manager: Public Works Department

Work Order: N509064

RECEIVED: 09-Sep-15

REPORTED: 11-Sep-15 13:52

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

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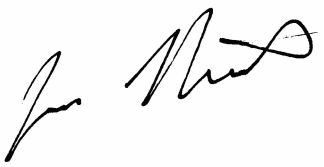

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N509064

LAB #				**N509064-01**
SAMPLED DATE				**09-Sep-15**
SAMPLED TIME				**09:40**
SAMPLE ID				**Park Ave Flushing Station**
	MRL	***Units***	***CDWG***	
Bacteriological Parameters (Water)				
Total Coliforms	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	1
E. coli	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
MAC	Maximum Acceptable Concentration
AO	Aestetic Objective (not health related)
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

ANALYTICAL REPORT

City of Prince Rupert
424 3rd Avenue West
Prince Rupert BC, V8J 1L7
water@princerupert.ca

Project: Drinking Water
Project Number: -
Project Manager: Public Works Department

Work Order: N507194

RECEIVED: 24-Jul-15

REPORTED: 27-Jul-15 09:58

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

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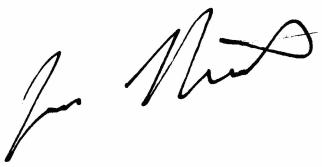

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N507194

LAB #				**N507194-01**
SAMPLED DATE				**24-Jul-15**
SAMPLED TIME				**15:57**
SAMPLE ID				**Montreal Circle Reservoir**
	MRL	***Units***	***CDWG***	
Bacteriological Parameters (Water)				
Total Coliforms	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1
Background Bacteria, Non-Coliform	*1*	*CFU/100 mL*	-	<1
E. coli	*1*	*CFU/100 mL*	*MAC = None Detected (<1)*	<1

Bacteriological Parameters Comments

Lab Number **N507194-01** (Sample ID: "**Montreal Circle Reservoir**") contained **<1 Total Coliforms** and **E. coli** per 100mL. Based soley on these results this water sample is bacteriologically safe for drinking, according to Health Canada's guidelines.

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
MAC	Maximum Acceptable Concentration
AO	Aestetic Objective (not health related)
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

ANALYTICAL REPORT

City of Prince Rupert	Project: Drinking Water
424 3rd Avenue West	Project Number: -
Prince Rupert BC, V8J 1L7	Project Manager: Public Works Department
water@princerupert.ca	
Work Order: N507051	
RECEIVED: 08-Jul-15	**REPORTED:** 24-Jul-15 16:15

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

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Jesse Newton
Laboratory Manager

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ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N507051

LAB #				N507051-01	N507051-02	N507051-03	N507051-04
SAMPLED DATE				08-Jul-15	08-Jul-15	08-Jul-15	08-Jul-15
SAMPLED TIME				08:43	09:04	09:15	11:28
SAMPLE ID				Frederick Station	Montreal Circle Reservoir	Sourdough Bay Flushing Stn.	Pillsbury Station
	MRL	*Units*	*CDWG*				
Anions (Water)							
Chloride	*1.0*	*mg/L*	*AO <= 250*	**4.8**	**5.0**	**5.4**	**5.2**
Fluoride	*0.05*	*mg/L*	*MAC = 1.5*	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	*0.01*	*mg/L*	*MAC = 1*	<0.01	<0.01	<0.01	<0.01
Nitrate + Nitrite (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.10	<0.10	<0.10	<0.10
Sulfate	*1.0*	*mg/L*	*AO <= 500*	**1.6**	**1.6**	**1.6**	**1.6**
General Parameters (Water)							
Alkalinity (total, as CaCO3)	*1*	*mg/L*	*-*	**5**	**5**	**6**	**5**
Colour	*1*	*PtCo units*	*AO <= 15*	**9**	**7**	**9**	**16**
Conductivity	*1.0*	*uS/cm*	*-*	**32.9**	**32.6**	**34.7**	**33.2**
pH	*1.0*	*-*	*6.5-8.5*	**6.6**	**6.5**	**6.6**	**6.5**
Solids, Total Dissolved / TDS	*1.0*	*mg/L*	*AO <= 500*	**26**	**38**	**36**	**32**
Turbidity	*0.05*	*NTU*	*MAC = 1*	**0.52**	**0.43**	**0.36**	**0.45**
Carbon, Total Organic	*0.5*	*mg/L*	*-*	**2.6**	**2.6**	**2.6**	**2.7**
Calculated Parameters (Water)							
Total Haloacetic Acids (HAA5)	*0.010*	*mg/L*	*MAC = 0.08*				**0.246**
Total Trihalomethanes	*0.013*	*mg/L*	*MAC = 0.1*	**0.097**	**0.122**	**0.158**	**0.152**
Nitrate (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.10	<0.10	<0.10	<0.10
Hardness (total, as CaCO3)	*1.25*	*mg/L*	*-*	**11.6**	**11.6**	**12.9**	**12.4**
Total Recoverable Metals (Water)							
Aluminum, total	*0.005*	*mg/L*	*OG < 0.1*	**0.065**	**0.065**	**0.061**	**0.066**
Antimony, total	*0.0001*	*mg/L*	*MAC = 0.006*	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic, total	*0.0005*	*mg/L*	*MAC = 0.01*	<0.0005	<0.0005	<0.0005	<0.0005
Barium, total	*0.005*	*mg/L*	*MAC = 1*	**0.008**	**0.008**	**0.008**	**0.008**
Beryllium, total	*0.0001*	*mg/L*	*-*	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth, total	*0.0001*	*mg/L*	*-*	<0.0001	<0.0001	<0.0001	<0.0001
Boron, total	*0.004*	*mg/L*	*MAC = 5*	**0.021**	**0.011**	**0.008**	**0.006**
Cadmium, total	*0.00001*	*mg/L*	*MAC = 0.005*	<0.00001	<0.00001	<0.00001	<0.00001
Calcium, total	*0.5*	*mg/L*	*-*	**4.0**	**4.0**	**4.6**	**4.3**
Chromium, total	*0.0005*	*mg/L*	*MAC = 0.05*	**0.0013**	**0.0014**	**0.0015**	**0.0015**
Cobalt, total	*0.00005*	*mg/L*	*-*	**0.00005**	**0.00005**	<0.00005	**0.00005**
Copper, total	*0.0002*	*mg/L*	*AO <= 1*	**0.0490**	**0.0687**	**0.0697**	**0.0794**
Iron, total	*0.01*	*mg/L*	*AO <= 0.3*	**0.12**	**0.12**	**0.12**	**0.13**

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ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N507051

				N507051-01	N507051-02	N507051-03	N507051-04
LAB #							
SAMPLED DATE				08-Jul-15	08-Jul-15	08-Jul-15	08-Jul-15
SAMPLED TIME				08:43	09:04	09:15	11:28
SAMPLE ID				Frederick Station	Montreal Circle Reservoir	Sourdough Bay Flushing Stn.	Pillsbury Station
	MRL	***Units***	***CDWG***				
Total Recoverable Metals (continued)							
Lead, total	*0.0001*	*mg/L*	*MAC = 0.01*	**0.0003**	**0.0003**	**0.0007**	**0.0003**
Lithium, total	*0.0001*	*mg/L*	-	**0.0002**	**0.0001**	**0.0001**	**0.0002**
Magnesium, total	*0.01*	*mg/L*	-	**0.37**	**0.37**	**0.38**	**0.38**
Manganese, total	*0.0002*	*mg/L*	*AO <= 0.05*	**0.0037**	**0.0035**	**0.0027**	**0.0036**
Mercury, total	*0.00002*	*mg/L*	*MAC = 0.001*	<0.00002	<0.00002	<0.00002	<0.00002
Molybdenum, total	*0.0001*	*mg/L*	-	**0.0001**	**0.0001**	<0.0001	<0.0001
Nickel, total	*0.0002*	*mg/L*	-	**0.0004**	**0.0010**	**0.0005**	**0.0004**
Phosphorus, total	*0.02*	*mg/L*	-	<0.02	<0.02	<0.02	<0.02
Potassium, total	*0.02*	*mg/L*	-	**0.44**	**0.44**	**0.43**	**0.44**
Selenium, total	*0.0005*	*mg/L*	*MAC = 0.05*	<0.0005	<0.0005	<0.0005	<0.0005
Silicon, total	*0.5*	*mg/L*	-	**1.1**	**1.2**	**1.2**	**1.2**
Silver, total	*0.00005*	*mg/L*	-	<0.00005	<0.00005	<0.00005	<0.00005
Sodium, total	*0.02*	*mg/L*	*AO <= 200*	**1.34**	**1.20**	**1.18**	**1.17**
Strontium, total	*0.001*	*mg/L*	-	**0.016**	**0.016**	**0.017**	**0.017**
Sulfur, total	*1*	*mg/L*	-	<1	<1	<1	<1
Tellurium, total	*0.0002*	*mg/L*	-	<0.0002	<0.0002	<0.0002	<0.0002
Thallium, total	*0.00002*	*mg/L*	-	<0.00002	<0.00002	<0.00002	<0.00002
Thorium, total	*0.0001*	*mg/L*	-	<0.0001	<0.0001	<0.0001	<0.0001
Tin, total	*0.0002*	*mg/L*	-	<0.0002	**0.0004**	<0.0002	<0.0002
Titanium, total	*0.005*	*mg/L*	-	<0.005	<0.005	<0.005	<0.005
Uranium, total	*0.00002*	*mg/L*	*MAC = 0.02*	<0.00002	<0.00002	<0.00002	<0.00002
Vanadium, total	*0.001*	*mg/L*	-	<0.001	<0.001	<0.001	<0.001
Zinc, total	*0.004*	*mg/L*	*AO <= 5*	**0.005**	<0.004	**0.005**	<0.004
Zirconium, total	*0.0001*	*mg/L*	-	<0.0001	<0.0001	<0.0001	<0.0001
Haloacetic Acids (Water)							
Monochloroacetic Acid	*0.002*	*mg/L*	-				<0.002
Monobromoacetic Acid	*0.002*	*mg/L*	-				<0.002
Dichloroacetic Acid	*0.002*	*mg/L*	-				**0.075**
Trichloroacetic Acid	*0.010*	*mg/L*	-				**0.172**
Dibromoacetic Acid	*0.002*	*mg/L*	-				<0.002
2-Bromopropionic Acid	*85-160*	*[surr]*	-				***143%***
Volatile Organic Compounds (VOC) (Water)							
Bromodichloromethane	*0.001*	*mg/L*	-	<0.001	**0.001**	**0.002**	**0.002**
Bromoform	*0.001*	*mg/L*	-	<0.001	<0.001	<0.001	<0.001

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ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N507051

				N507051-01	N507051-02	N507051-03	N507051-04
LAB #							
SAMPLED DATE				08-Jul-15	08-Jul-15	08-Jul-15	08-Jul-15
SAMPLED TIME				08:43	09:04	09:15	11:28
SAMPLE ID				Frederick Station	Montreal Circle Reservoir	Sourdough Bay Flushing Stn.	Pillsbury Station
	MRL	***Units***	***CDWG***				
Volatile Organic Compounds (VOC) (continued)							
Chloroform	*0.010*	*mg/L*	-	**0.097**	**0.121**	**0.157**	**0.150**
Dibromochloromethane	*0.001*	*mg/L*	-	<0.001	<0.001	<0.001	<0.001
Toluene-d8	*70-130*	*[surr]*	-	***116%***	***116%***	***116%***	***116%***
4-Bromofluorobenzene	*70-130*	*[surr]*	-	***84%***	***82%***	***83%***	***83%***

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ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N507051

LAB #				**N507051-05**
SAMPLED DATE				**08-Jul-15**
SAMPLED TIME				**09:45**
SAMPLE ID				**Woodworth Lake**
	MRL	***Units***	***CDWG***	
Anions (Water)				
Chloride	*1.0*	*mg/L*	*AO <= 250*	**1.5**
Fluoride	*0.05*	*mg/L*	*MAC = 1.5*	<0.10
Nitrite (as N)	*0.01*	*mg/L*	*MAC = 1*	<0.01
Nitrate + Nitrite (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.10
Sulfate	*1.0*	*mg/L*	*AO <= 500*	**1.6**
General Parameters (Water)				
Alkalinity (total, as CaCO3)	*1*	*mg/L*	-	**10**
Colour	*1*	*PtCo units*	*AO <= 15*	**28**
Conductivity	*1.0*	*uS/cm*	-	**28.5**
pH	*1.0*	-	*6.5-8.5*	**7.1**
Solids, Total Dissolved / TDS	*1.0*	*mg/L*	*AO <= 500*	**25**
Turbidity	*0.05*	*NTU*	*MAC = 1*	**0.37**
Carbon, Total Organic	*0.5*	*mg/L*	-	**2.9**
Calculated Parameters (Water)				
Nitrate (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.10
Hardness (total, as CaCO3)	*1.25*	*mg/L*	-	**12.1**
Total Recoverable Metals (Water)				
Aluminum, total	*0.005*	*mg/L*	*OG < 0.1*	**0.069**
Antimony, total	*0.0001*	*mg/L*	*MAC = 0.006*	<0.0001
Arsenic, total	*0.0005*	*mg/L*	*MAC = 0.01*	<0.0005
Barium, total	*0.005*	*mg/L*	*MAC = 1*	**0.007**
Beryllium, total	*0.0001*	*mg/L*	-	<0.0001
Bismuth, total	*0.0001*	*mg/L*	-	<0.0001
Boron, total	*0.004*	*mg/L*	*MAC = 5*	**0.006**
Cadmium, total	*0.00001*	*mg/L*	*MAC = 0.005*	<0.00001
Calcium, total	*0.5*	*mg/L*	-	**4.2**
Chromium, total	*0.0005*	*mg/L*	*MAC = 0.05*	**0.0016**
Cobalt, total	*0.00005*	*mg/L*	-	**0.00005**
Copper, total	*0.0002*	*mg/L*	*AO <= 1*	**0.0016**
Iron, total	*0.01*	*mg/L*	*AO <= 0.3*	**0.12**
Lead, total	*0.0001*	*mg/L*	*MAC = 0.01*	<0.0001
Lithium, total	*0.0001*	*mg/L*	-	**0.0001**
Magnesium, total	*0.01*	*mg/L*	-	**0.39**
Manganese, total	*0.0002*	*mg/L*	*AO <= 0.05*	**0.0037**

norlabs
Northern Laboratories (2010) Ltd.

ANALYTICAL REPORT

City of Prince Rupert **Work Order:** N507051

LAB #				**N507051-05**
SAMPLED DATE				**08-Jul-15**
SAMPLED TIME				**09:45**
SAMPLE ID				**Woodworth Lake**
	MRL	***Units***	***CDWG***	
Total Recoverable Metals (continued)				
Mercury, total	*0.00002*	*mg/L*	*MAC = 0.001*	<0.00002
Molybdenum, total	*0.0001*	*mg/L*	-	<0.0001
Nickel, total	*0.0002*	*mg/L*	-	**0.0004**
Phosphorus, total	*0.02*	*mg/L*	-	<0.02
Potassium, total	*0.02*	*mg/L*	-	**0.44**
Selenium, total	*0.0005*	*mg/L*	*MAC = 0.05*	<0.0005
Silicon, total	*0.5*	*mg/L*	-	**1.2**
Silver, total	*0.00005*	*mg/L*	-	<0.00005
Sodium, total	*0.02*	*mg/L*	*AO <= 200*	**1.16**
Strontium, total	*0.001*	*mg/L*	-	**0.016**
Sulfur, total	*1*	*mg/L*	-	<1
Tellurium, total	*0.0002*	*mg/L*	-	<0.0002
Thallium, total	*0.00002*	*mg/L*	-	<0.00002
Thorium, total	*0.0001*	*mg/L*	-	<0.0001
Tin, total	*0.0002*	*mg/L*	-	<0.0002
Titanium, total	*0.005*	*mg/L*	-	<0.005
Uranium, total	*0.00002*	*mg/L*	*MAC = 0.02*	<0.00002
Vanadium, total	*0.001*	*mg/L*	-	<0.001
Zinc, total	*0.004*	*mg/L*	*AO <= 5*	<0.004
Zirconium, total	*0.0001*	*mg/L*	-	<0.0001

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
PtCo units	Platinum Colbalt colour units
uS/cm	Micro Seimens per centimeter
MAC	Maximum Acceptable Concentration
AO	Aestetic Objective (not health related)
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf