The City of Terrace Annual Water System Report for 2016

The City of Terrace Community Water System serves a population of approximately 12,000 people with 3,943 water connections. There are three sources of water that the system draws from: Frank Street Wells, Deep Creek and the Skeena River. The Frank Street Wells provide over 99% of the water delivered to its customers with Deep Creek and the Skeena River serving as emergency backup sources. Storage is provided at two reservoir sites; Wilson Street reservoirs which services most of the community as well as Brauns Island and the Halliwell Reservoir that services the bench neighborhoods and some areas of the Regional District to the north of town. The Halliwell reservoir which is located on the side of Terrace Mountain is the largest of the three with a capacity of 2,727m3 and a maximum winter turnover of 48hrs.The two reservoirs at Wilson Street operate conjointly and have a combined volume of 2,712m3 with a maximum winter turnover rate of 30hrs.

The City of Terrace operates under Permit conditions set by the Environmental Health Officer (Northern Health Authority) and as such requires the system to maintain free chlorine residuals to ensure disinfection capabilities within the potable water system. Fluoride is also added to the water to provide dental care for the City of Terrace's younger residents.

To measure ongoing water quality The City of Terrace collects three Bacteriological samples at representative sites within the system each week and delivers them to Northern Health for analysis. A total of 150 Bacteriological samples were taken in 2016, as well as daily free chlorine tests done. There were no positive results for the presence of Coli form or E. coli bacteria in 2016.The City of Terrace also gauges water quality by measuring turbidity (NTU~s) units, with a maximum allowable NTU of one. The water system averages 0.15 NTU, well below permit levels as most of the systems water comes from the ground source at Frank St Wells.

A chemical analysis of the Frank St. Wells done on June 22, 2016 is attached to this report. All parameters tested were in compliance with the Canadian drinking water guidelines.

The flushing of water main dead ends is another practice that promotes refreshing of potable water. This exercise is done twice a year in the spring and the fall.

In 2016, the City of Terrace undertook several improvements to its water system. A Supervisory Control And Data Acquisition (SCADA) upgrade was continued from 2013. This will enable the City of Terrace water system operators to have remote control and viewing capabilities. This SCADA project will be implemented over the next couple of years. There was also 415m of 150mm water main replaced during Loen Avenue and Skeena Street

reconstruction projects. Four Hydrants were up-graded to new Canada Valve hydrants within these projects as well.

The City of Terrace's community water system is a safe, reliable source of potable water that meets its needs, in addition providing fire protection capabilities.

The City of Terrace and its Water System operators except the challenge and responsibility of providing a Community Water System that will always be transforming due to technical improvements and increasing demand on the system.

For more information and inquiries, contact Robert Hoekstra, Environmental Services Foreman at 250-635-6871 or via email at rhoekstra@terrace.ca

ANALYTICAL REPORT

City of Terrace
5003 Graham Avenue
Terrace, BC V8G 1B3
rhoekstra@terrace.ca

Project: Frank Street Wells
Project Number: -
Project Manager: Robert Hoekstra

Work Order: N606176

RECEIVED: 23-Jun-16

REPORTED: 19-Jul-16

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.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

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ANALYTICAL REPORT

City of Terrace **Work Order:** N606176

LAB #				**N606176-01**	**N606176-02**	**N606176-03**
SAMPLED DATE				**22-Jun-16**	**22-Jun-16**	**22-Jun-16**
SAMPLED TIME				**11:30**	**11:45**	**11:15**
SAMPLE ID				**Well #1**	**Well #2**	**Well #3**
	MRL	***Units***	***CDWG***			
Anions (Water)						
Chloride	*1.0*	*mg/L*	*AO <= 250*	**33.4**	**34.1**	**33.3**
Fluoride	*0.05*	*mg/L*	*MAC = 1.5*	<0.10	<0.10	<0.10
Nitrate + Nitrite (as N)	*0.10*	*mg/L*	*MAC = 10*	**0.60**	**0.76**	**0.31**
Sulfate	*1.0*	*mg/L*	*AO <= 500*	**13.9**	**12.9**	**16.0**
General Parameters (Water)						
pH	*1.0*	*pH units*	*6.5-8.5*	**7.1**	**7.1**	**7.4**
Alkalinity (total, as CaCO3)	*1*	*mg/L*	-	**160**	**150**	**180**
Conductivity	*1.0*	*uS/cm*	-	**437**	**410**	**460**
Colour	*1*	*PtCo units*	*AO <= 15*	**1**	**3**	**4**
Turbidity	*0.05*	*NTU*	*MAC = 1*	**0.11**	**0.47**	**0.61**
Solids, Total Dissolved / TDS	*1.0*	*mg/L*	*AO <= 500*	**270**	**250**	**280**
Cyanide, Total	*0.0020*	*mg/L*	*MAC = 0.2*	**0.0030**	<0.0020	<0.0020
Phosphorus (total)	*0.1*	*mg/L*	-	<0.2	<0.2	<0.2
Calculated Parameters (Water)						
Hardness, Total (as CaCO3)	*0.50*	*mg/L*	-	**182**	**170**	**202**
Total Metals (Water)						
Aluminum, total	*0.005*	*mg/L*	*OG < 0.1*	<0.005	<0.005	**0.020**
Antimony, total	*0.0001*	*mg/L*	*MAC = 0.006*	<0.0001	**0.0002**	<0.0001
Arsenic, total	*0.0005*	*mg/L*	*MAC = 0.01*	<0.0005	**0.0006**	**0.0006**
Barium, total	*0.005*	*mg/L*	*MAC = 1*	**0.093**	**0.079**	**0.109**
Beryllium, total	*0.0001*	*mg/L*	-	<0.0001	<0.0001	<0.0001
Bismuth, total	*0.0001*	*mg/L*	-	<0.0001	<0.0001	<0.0001
Boron, total	*0.004*	*mg/L*	*MAC = 5*	**0.015**	**0.016**	**0.014**
Cadmium, total	*0.00001*	*mg/L*	*MAC = 0.005*	<0.00001	**0.00014**	**0.00002**
Calcium, total	*0.2*	*mg/L*	-	**62.2**	**57.8**	**70.2**
Chromium, total	*0.0005*	*mg/L*	*MAC = 0.05*	<0.0005	<0.0005	<0.0005
Cobalt, total	*0.00005*	*mg/L*	-	<0.00005	**0.00007**	<0.00005
Copper, total	*0.0002*	*mg/L*	*AO <= 1*	**0.0024**	**0.0230**	**0.0085**
Iron, total	*0.01*	*mg/L*	*AO <= 0.3*	<0.01	**1.04**	**0.03**
Lead, total	*0.0001*	*mg/L*	*MAC = 0.01*	**0.0003**	**0.0156**	**0.0010**
Lithium, total	*0.0001*	*mg/L*	-	**0.0019**	**0.0017**	**0.0022**
Magnesium, total	*0.01*	*mg/L*	-	**6.44**	**6.10**	**6.56**
Manganese, total	*0.0002*	*mg/L*	*AO <= 0.05*	<0.0002	**0.0011**	**0.0070**
Mercury, total	*0.00002*	*mg/L*	*MAC = 0.001*	<0.00002	<0.00002	<0.00002

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ANALYTICAL REPORT

City of Terrace **Work Order:** N606176

				N606176-01	N606176-02	N606176-03
LAB #						
SAMPLED DATE				22-Jun-16	22-Jun-16	22-Jun-16
SAMPLED TIME				11:30	11:45	11:15
SAMPLE ID				Well #1	Well #2	Well #3
	MRL	***Units***	***CDWG***			
Total Metals (continued)						
Molybdenum, total	*0.0001*	*mg/L*	-	**0.0004**	**0.0003**	**0.0006**
Nickel, total	*0.0002*	*mg/L*	-	**0.0004**	**0.0084**	**0.0003**
Phosphorus, total	*0.02*	*mg/L*	-	**0.03**	**0.03**	**0.03**
Potassium, total	*0.02*	*mg/L*	-	**1.92**	**1.78**	**2.01**
Selenium, total	*0.0005*	*mg/L*	*MAC = 0.05*	<0.0005	<0.0005	<0.0005
Silicon, total	*0.5*	*mg/L*	-	**6.6**	**6.8**	**6.4**
Silver, total	*0.00005*	*mg/L*	-	<0.00005	<0.00005	<0.00005
Sodium, total	*0.02*	*mg/L*	*AO <= 200*	**15.0**	**14.4**	**12.9**
Strontium, total	*0.001*	*mg/L*	-	**0.217**	**0.203**	**0.230**
Sulfur, total	*1*	*mg/L*	-	**4**	**4**	**4**
Tellurium, total	*0.0002*	*mg/L*	-	<0.0002	<0.0002	<0.0002
Thallium, total	*0.00002*	*mg/L*	-	<0.00002	<0.00002	<0.00002
Thorium, total	*0.0001*	*mg/L*	-	<0.0001	<0.0001	<0.0001
Tin, total	*0.0002*	*mg/L*	-	<0.0002	**0.0003**	**0.0003**
Titanium, total	*0.005*	*mg/L*	-	<0.005	<0.005	<0.005
Uranium, total	*0.00002*	*mg/L*	*MAC = 0.02*	**0.00024**	**0.00022**	**0.00030**
Vanadium, total	*0.001*	*mg/L*	-	<0.001	**0.001**	<0.001
Zinc, total	*0.004*	*mg/L*	*AO <= 5*	**0.011**	**0.112**	**0.006**
Zirconium, total	*0.0001*	*mg/L*	-	<0.0001	<0.0001	<0.0001
BCMOE Aggregate Hydrocarbons (Water)						
VHw (6-10)	*100*	*ug/L*	-	<100	<100	<100
VPHw	*100*	*ug/L*	-	<100	<100	<100
Volatile Organic Compounds (VOC) (Water)						
Benzene	*0.5*	*ug/L*	*MAC = 5*	<0.5	<0.5	<0.5
Ethylbenzene	*1.0*	*ug/L*	*AO <= 1.6*	<1.0	<1.0	<1.0
Methyl tert-butyl ether	*1.0*	*ug/L*	*AO <= 15*	<1.0	<1.0	<1.0
Styrene	*1.0*	*ug/L*	-	<1.0	<1.0	<1.0
Toluene	*1.0*	*ug/L*	*AO <= 24*	<1.0	<1.0	<1.0
Xylenes (total)	*2.0*	*ug/L*	*AO <= 20*	<2.0	<2.0	<2.0

ANALYTICAL REPORT

City of Terrace **Work Order:** N606176

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
pH units	pH units
PtCo units	Platinum Colbalt colour units
ug/L	Micrograms per Litre
uS/cm	Micro Seimens per centimeter
MAC	Maximum Acceptable Concentration (health related guideline)
AO	Aesthetic 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 Terrace
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Project: Frank Street Wells
Project Number: -
Project Manager: Robert Hoekstra

Work Order: N608120

RECEIVED: 16-Aug-16

REPORTED: 19-Aug-16

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.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

City of Terrace **Work Order:** N608120

LAB #				**N608120-01**
SAMPLED DATE				**15-Aug-16**
SAMPLED TIME				**13:15**
SAMPLE ID				**Well #2**
	MRL	***Units***	***CDWG***	
Total Metals (Water)				
Copper, total	*0.0020*	*mg/L*	*AO <= 1*	**0.0042**
Iron, total	*0.10*	*mg/L*	*AO <= 0.3*	<0.10
Lead, total	*0.0010*	*mg/L*	*MAC = 0.01*	<0.0010

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
mg/L	Milligrams per Litre
MAC	Maximum Acceptable Concentration (health related guideline)
AO	Aesthetic 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