



Cartier Regional Water Co-op - Headingley
Regional - PWS
ATTN: DAVID EPLER
CRWC - Headingley Regional - PWS
6000 Portage Avenue
Headingley MB R4H 1E8

Date Received: 17-JUL-18
Report Date: 30-JUL-18 09:34 (MT)
Version: FINAL

Client Phone: 204-832-2555

Certificate of Analysis

Lab Work Order #: L2130734
Project P.O. #: NOT SUBMITTED
Job Reference: HEADINGLEY REGIONAL - PWS 89.40
C of C Numbers:
Legal Site Desc: 57047

Hua Wo
Chemistry Laboratory Manager

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ANALYTICAL REPORT

Physical Tests (WATER)

		ALS ID		L2130734-1	L2130734-2
		Sampled Date		17-JUL-18	17-JUL-18
		Sampled Time		13:10	13:10
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	23.7	<5.0
Conductivity	umhos/cm	-	-	900	197
Hardness (as CaCO3)	mg/L	-	-	370 ^{HTC}	35.7 ^{HTC}
Langelier Index (4 C)	No Unit	-	-	1.1	-1.2
Langelier Index (60 C)	No Unit	-	-	1.9	-0.39
pH	pH units	7.00-10.5	-	8.61	7.71
Total Dissolved Solids	mg/L	500	-	702	130
Transmittance, UV (254 nm)	%T/cm	-	-	50.6	97.3
Turbidity	NTU	-	-	12.9	0.17

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Anions and Nutrients (WATER)

		ALS ID		L2130734-1	L2130734-2
		Sampled Date		17-JUL-18	17-JUL-18
		Sampled Time		13:10	13:10
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO3)	mg/L	-	-	244	39.1
Ammonia, Total (as N)	mg/L	-	-	0.137	<0.010
Bicarbonate (HCO3)	mg/L	-	-	269	47.7
Bromide (Br)	mg/L	-	-	0.063	<0.010
Carbonate (CO3)	mg/L	-	-	13.8	<0.60
Chloride (Cl)	mg/L	250	-	23.2	2.95
Fluoride (F)	mg/L	-	1.5	0.195	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.138	0.0586
Nitrite (as N)	mg/L	-	1	0.0116	<0.0010
Sulfate (SO4)	mg/L	500	-	250	52.9

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Organic / Inorganic Carbon (WATER)

		ALS ID		L2130734-1	L2130734-2
		Sampled Date		17-JUL-18	17-JUL-18
		Sampled Time		13:10	13:10
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	11.3	<0.50
Total Organic Carbon	mg/L	-	-	11.0	<0.50

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

 Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
 Analytical result for this parameter exceeds Guide Limit listed on this report.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

Total Metals (WATER)

Analyte	Unit	ALS ID		L2130734-1	L2130734-2
		Guide Limit #1	Guide Limit #2	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID
Aluminum (Al)-Total	mg/L	0.1	-	0.287	0.0137
Antimony (Sb)-Total	mg/L	-	0.006	0.00031	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00935	0.00011
Barium (Ba)-Total	mg/L	-	1	0.0595	0.00131
Beryllium (Be)-Total	mg/L	-	-	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.092	0.080
Cadmium (Cd)-Total	mg/L	-	0.005	0.0000161	<0.000050
Calcium (Ca)-Total	mg/L	-	-	73.9	13.5
Cesium (Cs)-Total	mg/L	-	-	0.000042	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00092	0.00022
Cobalt (Co)-Total	mg/L	-	-	0.00034	<0.00010
Copper (Cu)-Total	mg/L	1	2	0.0437	0.00266
Iron (Fe)-Total	mg/L	0.3	-	0.378	0.012
Lead (Pb)-Total	mg/L	-	0.01	0.000185	0.000117
Lithium (Li)-Total	mg/L	-	-	0.0594	0.0043
Magnesium (Mg)-Total	mg/L	-	-	45.1	0.491
Manganese (Mn)-Total	mg/L	0.05	-	0.139	0.00180
Molybdenum (Mo)-Total	mg/L	-	-	0.00340	<0.000050
Nickel (Ni)-Total	mg/L	-	-	0.00386	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.237	<0.050
Potassium (K)-Total	mg/L	-	-	13.2	0.832
Rubidium (Rb)-Total	mg/L	-	-	0.00293	0.00024
Selenium (Se)-Total	mg/L	-	0.05	0.000493	<0.000050
Silicon (Si)-Total	mg/L	-	-	10.1	0.66
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	49.2	23.6
Strontium (Sr)-Total	mg/L	-	-	0.310	0.0344
Sulfur (S)-Total	mg/L	-	-	89.7	19.0
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	0.000015	<0.000010
Thorium (Th)-Total	mg/L	-	-	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)

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* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Total Metals (WATER)

		ALS ID		L2130734-1	L2130734-2
		Sampled Date		17-JUL-18	17-JUL-18
		Sampled Time		13:10	13:10
		Sample ID		HEADINGLEY	HEADINGLEY
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED
Titanium (Ti)-Total	mg/L	-	-	0.00867	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00327	0.000018
Vanadium (V)-Total	mg/L	-	-	0.00529	<0.00050
Zinc (Zn)-Total	mg/L	5	-	<0.0030	0.0060
Zirconium (Zr)-Total	mg/L	-	-	0.000399	<0.000060

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)

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Analytical result for this parameter exceeds Guide Limit listed on this report.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO ₃ 2-/L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO ₃ -/L.			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO ₃)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO ₃ - and H ₂ CO ₃ endpoints indicated electrometrically.			
BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP
Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO ₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO ₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C
True Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
ETL-LANGELIER-4-WP	Water	Langelier Index 4C	Calculated
ETL-LANGELIER-60-WP	Water	Langelier Index 60C	Calculated
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance (as % difference) cannot be calculated accurately for waters with very low electrical conductivity (EC), and is reported as "Low EC" where EC < 100 uS/cm (umhos/cm). Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = \frac{[\text{Cation Sum} - \text{Anion Sum}]}{[\text{Cation Sum} + \text{Anion Sum}]}$$

MET-T-CCMS-WP Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod.)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-WP Water Ammonia by colour APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2-L-IC-N-WP Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WP Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH-WP Water pH APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

SO4-IC-N-WP Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-WP Water Total Dissolved Solids (TDS) APHA 2540 SOLIDS C,E

A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.

TURBIDITY-WP Water Turbidity APHA 2130B (modified)

Turbidity in aqueous matrices is determined by the nephelometric method.

UV-%TRANS-WP Water UV Transmittance (Calculated) APHA 5910B

Test method is adapted from APHA Method 5910B. A sample is filtered through a 0.45 um polyethersulfone (PES) filter and its UV Absorbance is measured in a quartz cell at 254 nm. UV Transmittance is calculated from the UV Absorbance result and reported as UV Transmittance per cm. The analysis is carried out without pH adjustment.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.



Quality Control Report

Workorder: L2130734

Report Date: 30-JUL-18

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP								
	Water							
Batch	R4132522							
WG2826454-15	DUP	L2130691-4						
Alkalinity, Total (as CaCO3)		367	368		mg/L	0.4	20	18-JUL-18
WG2826454-14	LCS							
Alkalinity, Total (as CaCO3)			101.9		%		85-115	18-JUL-18
WG2826454-11	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	18-JUL-18
BR-L-IC-N-WP								
	Water							
Batch	R4133875							
WG2825492-11	DUP	L2130820-2						
Bromide (Br)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	18-JUL-18
WG2825492-10	LCS							
Bromide (Br)			97.4		%		85-115	18-JUL-18
WG2825492-9	MB							
Bromide (Br)			<0.010		mg/L		0.01	18-JUL-18
WG2825492-12	MS	L2130820-2						
Bromide (Br)			96.9		%		75-125	18-JUL-18
C-DOC-HTC-WP								
	Water							
Batch	R4146512							
WG2835919-3	DUP	L2130541-1						
Dissolved Organic Carbon		1.64	1.61		mg/L	1.8	20	29-JUL-18
WG2835919-2	LCS							
Dissolved Organic Carbon			99.2		%		80-120	29-JUL-18
WG2835919-1	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	29-JUL-18
WG2835919-4	MS	L2130541-2						
Dissolved Organic Carbon			102.2		%		70-130	29-JUL-18
C-TOC-HTC-WP								
	Water							
Batch	R4146517							
WG2835930-3	DUP	L2130541-1						
Total Organic Carbon		1.59	1.59		mg/L	0.0	20	29-JUL-18
WG2835930-2	LCS							
Total Organic Carbon			99.9		%		80-120	29-JUL-18
WG2835930-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	29-JUL-18
WG2835930-4	MS	L2130541-2						
Total Organic Carbon			103.2		%		70-130	29-JUL-18
CL-L-IC-N-WP								
	Water							



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
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 Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-WP		Water						
Batch	R4133875							
WG2825492-11	DUP	L2130820-2						
Chloride (Cl)		1.45	1.42		mg/L	2.1	20	18-JUL-18
WG2825492-10	LCS							
Chloride (Cl)			98.8		%		90-110	18-JUL-18
WG2825492-9	MB							
Chloride (Cl)			<0.10		mg/L		0.1	18-JUL-18
WG2825492-12	MS	L2130820-2						
Chloride (Cl)			98.2		%		75-125	18-JUL-18
COLOUR-TRUE-WP		Water						
Batch	R4131928							
WG2825780-6	DUP	L2130691-5						
Colour, True		50.0	53.3		CU	6.3	20	18-JUL-18
WG2825780-5	LCS							
Colour, True			100.5		%		85-115	18-JUL-18
WG2825780-4	MB							
Colour, True			<5.0		CU		5	18-JUL-18
EC-WP		Water						
Batch	R4132522							
WG2826454-15	DUP	L2130691-4						
Conductivity		991	988		umhos/cm	0.3	10	18-JUL-18
WG2826454-13	LCS							
Conductivity			97.4		%		90-110	18-JUL-18
WG2826454-11	MB							
Conductivity			<1.0		umhos/cm		1	18-JUL-18
F-IC-N-WP		Water						
Batch	R4133875							
WG2825492-11	DUP	L2130820-2						
Fluoride (F)		0.049	0.050		mg/L	1.2	20	18-JUL-18
WG2825492-10	LCS							
Fluoride (F)			104.6		%		90-110	18-JUL-18
WG2825492-9	MB							
Fluoride (F)			<0.020		mg/L		0.02	18-JUL-18
WG2825492-12	MS	L2130820-2						
Fluoride (F)			107.6		%		75-125	18-JUL-18
MET-T-CCMS-WP		Water						



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
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Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R4136049							
WG2826613-4	DUP	WG2826613-3						
Aluminum (Al)-Total		0.0531	0.0525		mg/L	1.2	20	20-JUL-18
Antimony (Sb)-Total		0.00010	0.00011		mg/L	6.1	20	20-JUL-18
Arsenic (As)-Total		0.00247	0.00252		mg/L	1.9	20	20-JUL-18
Barium (Ba)-Total		0.00605	0.00600		mg/L	0.8	20	20-JUL-18
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-JUL-18
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-JUL-18
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-JUL-18
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	20-JUL-18
Calcium (Ca)-Total		6.02	6.02		mg/L	0.0	20	20-JUL-18
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-JUL-18
Chromium (Cr)-Total		0.00039	0.00035		mg/L	9.1	20	20-JUL-18
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-JUL-18
Copper (Cu)-Total		0.00079	0.00081		mg/L	2.5	20	20-JUL-18
Iron (Fe)-Total		0.131	0.133		mg/L	1.1	20	20-JUL-18
Lead (Pb)-Total		0.000073	0.000081		mg/L	10	20	20-JUL-18
Lithium (Li)-Total		0.0011	0.0011		mg/L	0.7	20	20-JUL-18
Magnesium (Mg)-Total		1.78	1.80		mg/L	0.9	20	20-JUL-18
Manganese (Mn)-Total		0.00407	0.00389		mg/L	4.4	20	20-JUL-18
Molybdenum (Mo)-Total		0.000119	0.000118		mg/L	0.7	20	20-JUL-18
Nickel (Ni)-Total		0.00050	0.00050		mg/L	0.6	20	20-JUL-18
Potassium (K)-Total		0.698	0.700		mg/L	0.4	20	20-JUL-18
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-JUL-18
Rubidium (Rb)-Total		0.00141	0.00150		mg/L	6.5	20	20-JUL-18
Selenium (Se)-Total		0.000088	0.000081		mg/L	8.4	20	20-JUL-18
Silicon (Si)-Total		1.74	1.74		mg/L	0.2	20	20-JUL-18
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-JUL-18
Sodium (Na)-Total		1.18	1.19		mg/L	0.4	20	20-JUL-18
Strontium (Sr)-Total		0.0183	0.0184		mg/L	0.3	20	20-JUL-18
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	20-JUL-18
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	20-JUL-18
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-JUL-18
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-JUL-18
Tin (Sn)-Total		0.00013	0.00011		mg/L			20-JUL-18



Quality Control Report

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
 CRWC - Headingley Regional - PWS 6000 Portage Avenue
 Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R4136049							
WG2826613-4	DUP	WG2826613-3						
Tin (Sn)-Total		0.00013	0.00011		mg/L	9.2	20	20-JUL-18
Titanium (Ti)-Total		0.00134	0.00139		mg/L	3.5	20	20-JUL-18
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-JUL-18
Uranium (U)-Total		0.000063	0.000064		mg/L	2.0	20	20-JUL-18
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-JUL-18
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	20-JUL-18
Zirconium (Zr)-Total		0.000106	0.000110		mg/L	4.6	20	20-JUL-18
WG2826613-2	LCS							
Aluminum (Al)-Total			94.7		%		80-120	20-JUL-18
Antimony (Sb)-Total			96.3		%		80-120	20-JUL-18
Arsenic (As)-Total			97.2		%		80-120	20-JUL-18
Barium (Ba)-Total			99.8		%		80-120	20-JUL-18
Beryllium (Be)-Total			96.7		%		80-120	20-JUL-18
Bismuth (Bi)-Total			94.5		%		80-120	20-JUL-18
Boron (B)-Total			96.1		%		80-120	20-JUL-18
Cadmium (Cd)-Total			98.2		%		80-120	20-JUL-18
Calcium (Ca)-Total			100.5		%		80-120	20-JUL-18
Cesium (Cs)-Total			105.1		%		80-120	20-JUL-18
Chromium (Cr)-Total			95.7		%		80-120	20-JUL-18
Cobalt (Co)-Total			96.5		%		80-120	20-JUL-18
Copper (Cu)-Total			95.9		%		80-120	20-JUL-18
Iron (Fe)-Total			96.8		%		80-120	20-JUL-18
Lead (Pb)-Total			96.7		%		80-120	20-JUL-18
Lithium (Li)-Total			97.1		%		80-120	20-JUL-18
Magnesium (Mg)-Total			97.5		%		80-120	20-JUL-18
Manganese (Mn)-Total			95.5		%		80-120	20-JUL-18
Molybdenum (Mo)-Total			87.2		%		80-120	20-JUL-18
Nickel (Ni)-Total			96.1		%		80-120	20-JUL-18
Potassium (K)-Total			99.2		%		80-120	20-JUL-18
Phosphorus (P)-Total			94.2		%		80-120	20-JUL-18
Rubidium (Rb)-Total			100.4		%		80-120	20-JUL-18
Selenium (Se)-Total			94.7		%		80-120	20-JUL-18
Silicon (Si)-Total			95.7		%		80-120	20-JUL-18



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
 CRWC - Headingley Regional - PWS 6000 Portage Avenue
 Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP		Water						
Batch	R4136049							
WG2826613-2 LCS								
Silver (Ag)-Total			96.3		%		80-120	20-JUL-18
Sodium (Na)-Total			97.4		%		80-120	20-JUL-18
Strontium (Sr)-Total			96.9		%		80-120	20-JUL-18
Sulfur (S)-Total			101.2		%		80-120	20-JUL-18
Tellurium (Te)-Total			96.7		%		80-120	20-JUL-18
Thallium (Tl)-Total			96.4		%		80-120	20-JUL-18
Thorium (Th)-Total			94.4		%		80-120	20-JUL-18
Tin (Sn)-Total			97.2		%		80-120	20-JUL-18
Titanium (Ti)-Total			97.2		%		80-120	20-JUL-18
Tungsten (W)-Total			96.3		%		80-120	20-JUL-18
Uranium (U)-Total			100.9		%		80-120	20-JUL-18
Vanadium (V)-Total			98.7		%		80-120	20-JUL-18
Zinc (Zn)-Total			94.0		%		80-120	20-JUL-18
Zirconium (Zr)-Total			96.5		%		80-120	20-JUL-18
WG2826613-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	20-JUL-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	20-JUL-18
Boron (B)-Total			<0.010		mg/L		0.01	20-JUL-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	20-JUL-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	20-JUL-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	20-JUL-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	20-JUL-18
Iron (Fe)-Total			<0.010		mg/L		0.01	20-JUL-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	20-JUL-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	20-JUL-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	20-JUL-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	20-JUL-18



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP								
	Water							
Batch	R4136049							
WG2826613-1	MB							
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	20-JUL-18
Potassium (K)-Total			<0.050		mg/L		0.05	20-JUL-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	20-JUL-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	20-JUL-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	20-JUL-18
Silicon (Si)-Total			<0.10		mg/L		0.1	20-JUL-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	20-JUL-18
Sodium (Na)-Total			<0.050		mg/L		0.05	20-JUL-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	20-JUL-18
Sulfur (S)-Total			<0.50		mg/L		0.5	20-JUL-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	20-JUL-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	20-JUL-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	20-JUL-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	20-JUL-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	20-JUL-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	20-JUL-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	20-JUL-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	20-JUL-18
NH3-COL-WP								
	Water							
Batch	R4138815							
WG2828240-3	DUP	L2130718-2						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	20-JUL-18
WG2828240-2	LCS							
Ammonia, Total (as N)			100.6		%		85-115	20-JUL-18
WG2828240-1	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	20-JUL-18
WG2828240-4	MS	L2130718-2						
Ammonia, Total (as N)			89.4		%		75-125	20-JUL-18
NO2-L-IC-N-WP								
	Water							
Batch	R4133875							
WG2825492-11	DUP	L2130820-2						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-JUL-18
WG2825492-10	LCS							



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
 CRWC - Headingley Regional - PWS 6000 Portage Avenue
 Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-WP								
	Water							
Batch	R4133875							
WG2825492-10	LCS							
Nitrite (as N)			100.7		%		90-110	18-JUL-18
WG2825492-9	MB							
Nitrite (as N)			<0.0010		mg/L		0.001	18-JUL-18
WG2825492-12	MS	L2130820-2						
Nitrite (as N)			98.5		%		75-125	18-JUL-18
NO3-L-IC-N-WP								
	Water							
Batch	R4133875							
WG2825492-11	DUP	L2130820-2						
Nitrate (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	18-JUL-18
WG2825492-10	LCS							
Nitrate (as N)			98.9		%		90-110	18-JUL-18
WG2825492-9	MB							
Nitrate (as N)			<0.0050		mg/L		0.005	18-JUL-18
WG2825492-12	MS	L2130820-2						
Nitrate (as N)			98.2		%		75-125	18-JUL-18
PH-WP								
	Water							
Batch	R4132522							
WG2826454-15	DUP	L2130691-4						
pH		8.78	8.78	J	pH units	0.00	0.2	18-JUL-18
WG2826454-12	LCS							
pH			7.42		pH units		7.3-7.5	18-JUL-18
SO4-IC-N-WP								
	Water							
Batch	R4133875							
WG2825492-11	DUP	L2130820-2						
Sulfate (SO4)		0.43	0.41		mg/L	3.6	20	18-JUL-18
WG2825492-10	LCS							
Sulfate (SO4)			99.7		%		90-110	18-JUL-18
WG2825492-9	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	18-JUL-18
WG2825492-12	MS	L2130820-2						
Sulfate (SO4)			97.6		%		75-125	18-JUL-18
TDS-WP								
	Water							
Batch	R4132754							
WG2825321-7	DUP	L2130584-1						
Total Dissolved Solids		101	98		mg/L	3.7	20	18-JUL-18
WG2825321-6	LCS							



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
 CRWC - Headingley Regional - PWS 6000 Portage Avenue
 Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TDS-WP		Water						
Batch	R4132754							
WG2825321-6	LCS							
Total Dissolved Solids			99.8		%		85-115	18-JUL-18
WG2825321-5	MB							
Total Dissolved Solids			<4.0		mg/L		4	18-JUL-18
TURBIDITY-WP		Water						
Batch	R4132585							
WG2826585-8	DUP	L2130766-2						
Turbidity		7.89	7.79		NTU	1.3	15	18-JUL-18
WG2826585-9	LCS							
Turbidity			105.5		%		85-115	18-JUL-18
WG2826585-7	MB							
Turbidity			<0.10		NTU		0.1	18-JUL-18
UV-%TRANS-WP		Water						
Batch	R4132649							
WG2826672-3	DUP	L2129958-1						
Transmittance, UV (254 nm)		71.5	71.1		%T/cm	0.5	20	19-JUL-18
WG2826672-6	DUP	L2130734-2						
Transmittance, UV (254 nm)		97.3	97.9		%T/cm	0.7	20	19-JUL-18
WG2826672-7	IRM	BLANK						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	19-JUL-18
WG2826672-8	IRM	BLANK						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	19-JUL-18
WG2826672-2	LCS							
Transmittance, UV (254 nm)			107.7		%		85-115	19-JUL-18
WG2826672-5	LCS							
Transmittance, UV (254 nm)			108.5		%		85-115	19-JUL-18

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

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Contact: DAVID EPLER

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	17-JUL-18 13:10	18-JUL-18 12:00	0.25	23	hours	EHTR-FM
	2	17-JUL-18 13:10	18-JUL-18 12:00	0.25	23	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2130734 were received on 17-JUL-18 14:46.

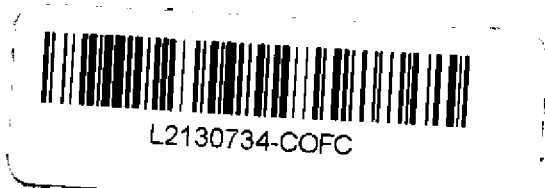
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Manitoba Sustainable Development
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4

Chain of Custody (COC)
Manitoba Drinking Water Systems
ONLY FOR: Regulatory General Chemistry & VOC Samples



Report to Operator (email pdf):				Owner billing (Email):				Regular Service (default):		Regular Service (is 5-7 Days):			
Contact:	David Epler, Lead Operator - CRWC - Headingley			Contact:	MWSB Accounts Payable			Unless otherwise requested:		1 Day, rush / priority			
Address:	6000 Portage Avenue Headingley MB R4H 1E8			Address:	Unit #1A - 2010 Currie Blvd. Brandon MB R7B 4E7					2 Day, rush / priority			
Phone:	204-832-2555			Phone:	204-728-6075					3 Day, rush / priority			
Email:	davidrepler@crwc.ca; headingleywtp@crwc.ca; angela.m			Email:	mwsb3@gov.mb.ca								
Operator contact update (if different then above):				Owner contact update (if different then above):				Email pdf copy to:					
Contact:				Contact:				DWO:	Kale Black				
Address:				Address:				DWO Address:	309-25 Tupper St. N. Portage La Prairie, MB.				
Phone:				Phone:				DWO Phone:	204-795-6908				
Email:				Email:				DWO Email:	kale.black@gov.mb.ca				
Account:			ODW Report type:	EMS (Lab-MWS)		Client / Project Information:				Analysis Request			
Agency Code:	382		Project:	DWQ-C		Operation Name:		Headingley Regional PWS					
Lab:			Lab Work Order # / Job # (lab use only)		Operation Code (com code):		89.40						
					Operation Id:		57047						
					Sampled by:								
Lab Sample # (lab use only)	Sample Number (YYMMII9999)	Station Number (MB99XXD999) / (MB99XXY999)	Sample Identification		Date dd-mmm-yyyy	Time hh:mm	Sample Matrix	Sample Type	MB-CH-PWS-V2013		Number of Containers		
	1807KB0003	MB05MJD481	Headingley Regional 1 - Raw		17/07/18	1:10pm	6	1				X	5
	1807KB0004	MB05MJD482	Headingley Regional 2 - Treated		17/07/18	1:10pm	10	1				X	5
Failure to complete all portions of this form may delay analysis.								Sample Matrix:		Sample Type:			
Please fill in this form LEGIBLY.								6-Raw Water, 10-Treated Water		1-Grab Sample			
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory.													
For ALL other testing, please use Laboratory specific forms.													
DO NOT COPY or RE-USE this form. Sample Numbers are unique to the Office of Drinking Water and provided by DWO.													
Relinquished By:		Date & Time:		Received By: (lab use only)		Date & Time: (lab use only)		Sample Condition (lab use only)					
Relinquished By:		Date & Time:		Received By: (lab use only)		Date & Time: (lab use only)		Temperature	Samples Received in Good Condition? Y / N (if no provide details)				
				<i>AS</i>		<i>07/17/18</i> <i>2:46 pm</i>		<i>22.1</i>					

Operator mandatory

Operator optional

Operator to fill, if information above has changed

Opr to fill, Lab specific

pre-filled by DWO