



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

Date Received: 16-MAY-23
Report Date: 09-JUN-23 12:54 (MT)
Version: FINAL REV. 2

Client Phone: 204-832-2555

Certificate of Analysis

Lab Work Order #: L2750680
Project P.O. #: NOT SUBMITTED
Job Reference: HEADINGLEY REGIONAL - PWS 89.40
C of C Numbers:
Legal Site Desc: HEADINGLEY REGIONAL - PWS

Other Information: INV COMMENTS: Reissue for W848339; change account from W10477 to W7374

Comments: 9-JUN-2023 AMENDED REPORT - Email recipients corrected and re-sent

Sheriza Rajack-Ahamed
Account Manager

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ANALYTICAL REPORT

Physical Tests (WATER)

		ALS ID		L2750680-1	L2750680-2
		Sampled Date		16-MAY-23	16-MAY-23
		Sampled Time		10:30	09:30
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	45.3	<5.0
Conductivity	umhos/cm	-	-	848	234
Hardness (as CaCO3)	mg/L	-	-	384 ^{HTC}	85.6 ^{HTC}
Langelier Index (4 C)	No Unit	-	-	0.91	-0.40
Langelier Index (60 C)	No Unit	-	-	1.7	0.37
pH	pH units	7.00-10.5	-	8.43	7.96
Total Dissolved Solids	mg/L	500	-	516	117
Transmittance, UV (254 nm)	%T/cm	-	-	44.7	97.7
Turbidity	NTU	-	-	200	0.15

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Anions and Nutrients (WATER)

		ALS ID		L2750680-1	L2750680-2
		Sampled Date		16-MAY-23	16-MAY-23
		Sampled Time		10:30	09:30
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO3)	mg/L	-	-	219	54.1
Ammonia, Total (as N)	mg/L	-	-	0.045	0.012
Bicarbonate (HCO3)	mg/L	-	-	253	66.0
Bromide (Br)	mg/L	-	-	0.059	<0.010
Carbonate (CO3)	mg/L	-	-	7.08	<0.60
Chloride (Cl)	mg/L	250	-	22.7	3.13
Fluoride (F)	mg/L	-	1.5	0.144	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.338	0.243
Nitrite (as N)	mg/L	-	1	0.0011	<0.0010
Sulfate (SO4)	mg/L	500	-	205	51.1

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

Organic / Inorganic Carbon (WATER)

		ALS ID		L2750680-1	L2750680-2
		Sampled Date		16-MAY-23	16-MAY-23
		Sampled Time		10:30	09:30
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	11.4	<0.50
Total Organic Carbon	mg/L	-	-	11.0	<0.50

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)

#2: GCDWQ - Maximum Acceptable Concentrations (MACs-Jan.2020)

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)

		ALS ID		L2750680-1	L2750680-2	L2750680-3
		Sampled Date		16-MAY-23	16-MAY-23	16-MAY-23
		Sampled Time		10:30	09:30	13:50
		Sample ID		HEADINGLEY	HEADINGLEY	HEADINGLEY
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED	REGIONAL 3 - DISTRIBUTION - SFX RES.
Aluminum (Al)-Total	mg/L	0.1	2.9	3.88	0.0048	<0.0030
Antimony (Sb)-Total	mg/L	-	0.006	0.00035	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00780	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	2	0.155	0.00114	0.00110
Beryllium (Be)-Total	mg/L	-	-	0.00027	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.000081	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.111	0.081	0.079
Cadmium (Cd)-Total	mg/L	-	0.005	0.000143	<0.000050	<0.000050
Calcium (Ca)-Total	mg/L	-	-	77.4	33.4	38.1
Cesium (Cs)-Total	mg/L	-	-	0.000687	<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00622	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.00395	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	1	2	0.0105	0.0207	0.00163
Iron (Fe)-Total	mg/L	0.3	-	7.29	<0.010	<0.010
Lead (Pb)-Total	mg/L	-	0.005	0.00427	<0.000050	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0572	0.0048	0.0049
Magnesium (Mg)-Total	mg/L	-	-	46.3	0.546	0.599
Manganese (Mn)-Total	mg/L	0.02	0.12	0.513	0.00842	0.00411
Molybdenum (Mo)-Total	mg/L	-	-	0.00308	<0.000050	<0.000050
Nickel (Ni)-Total	mg/L	-	-	0.0132	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.400	<0.050	<0.030
Potassium (K)-Total	mg/L	-	-	17.3	1.21	1.27
Rubidium (Rb)-Total	mg/L	-	-	0.0106	0.00025	0.00024
Selenium (Se)-Total	mg/L	-	0.05	0.000826	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	-	-	16.1	0.69	0.78
Silver (Ag)-Total	mg/L	-	-	0.000036	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	54.3	11.9	9.46
Strontium (Sr)-Total	mg/L	-	7	0.293	0.0350	0.0395
Sulfur (S)-Total	mg/L	-	-			16.7
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	0.000104	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-	0.00074	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	0.00011	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)

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

Total Metals (WATER)

		ALS ID		L2750680-1	L2750680-2	L2750680-3
		Sampled Date		16-MAY-23	16-MAY-23	16-MAY-23
		Sampled Time		10:30	09:30	13:50
		Sample ID		HEADINGLEY	HEADINGLEY	HEADINGLEY
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED	REGIONAL 3 - DISTRIBUTION - SFX RES.
Titanium (Ti)-Total	mg/L	-	-	0.0725	<0.00030	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00389	0.000028	0.000028
Vanadium (V)-Total	mg/L	-	-	0.0159	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	5	-	0.0305	0.0053	<0.0030
Zirconium (Zr)-Total	mg/L	-	-	0.00133	<0.00020	<0.00020

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2021)
#1: GCDWQ - Aesthetic Objective/Other Value (Jan.2020)
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 * 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-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
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

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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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.

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:

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

MET-T-CCMS-WP Water Total Metals in Water by CRC ICPMS EPA 200.2/6020B (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

Additional Information:

INV COMMENTS Reissue for W848339; change account from W10477 to W7374

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. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.



Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

Page 1 of 11

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 R5952178								
WG3784445-5	DUP	L2750602-1						
Alkalinity, Total (as CaCO3)		205	205		mg/L	0.3	20	17-MAY-23
WG3784445-4	LCS							
Alkalinity, Total (as CaCO3)			100.9		%		85-115	17-MAY-23
WG3784445-1	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	17-MAY-23
BR-L-IC-N-WP Water								
Batch R5952039								
WG3784432-2	LCS							
Bromide (Br)			102.0		%		85-115	16-MAY-23
WG3784432-1	MB							
Bromide (Br)			<0.010		mg/L		0.01	16-MAY-23
C-DOC-HTC-WP Water								
Batch R5952179								
WG3784480-3	DUP	L2750680-1						
Dissolved Organic Carbon		11.4	12.4		mg/L	8.6	20	17-MAY-23
WG3784480-2	LCS							
Dissolved Organic Carbon			102.9		%		80-120	17-MAY-23
WG3784480-1	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	17-MAY-23
WG3784480-4	MS	L2750680-2						
Dissolved Organic Carbon			100.3		%		70-130	17-MAY-23
C-TOC-HTC-WP Water								
Batch R5952180								
WG3784481-3	DUP	L2750680-1						
Total Organic Carbon		11.0	11.3		mg/L	3.5	20	17-MAY-23
WG3784481-2	LCS							
Total Organic Carbon			96.3		%		80-120	17-MAY-23
WG3784481-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	17-MAY-23
WG3784481-4	MS	L2750680-2						
Total Organic Carbon			97.2		%		70-130	17-MAY-23
CL-L-IC-N-WP Water								
Batch R5952039								
WG3784432-3	DUP	L2750660-1						
Chloride (Cl)		40.5	40.1		mg/L	0.8	20	16-MAY-23
WG3784432-2	LCS							



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Page 2 of 11

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	R5952039							
WG3784432-2	LCS							
Chloride (Cl)			99.0		%		90-110	16-MAY-23
WG3784432-1	MB							
Chloride (Cl)			<0.10		mg/L		0.1	16-MAY-23
WG3784432-4	MS	L2750660-1						
Chloride (Cl)			101.9		%		75-125	16-MAY-23
COLOUR-TRUE-WP								
	Water							
Batch	R5951981							
WG3784444-3	DUP	L2750660-6						
Colour, True		46.5	44.1		CU	5.3	20	17-MAY-23
WG3784444-2	LCS							
Colour, True			100.3		%		85-115	17-MAY-23
WG3784444-1	MB							
Colour, True			<5.0		CU		5	17-MAY-23
EC-WP								
	Water							
Batch	R5952178							
WG3784445-5	DUP	L2750602-1						
Conductivity		684	682		umhos/cm	0.3	10	17-MAY-23
WG3784445-3	LCS							
Conductivity			101.9		%		90-110	17-MAY-23
WG3784445-1	MB							
Conductivity			<1.0		umhos/cm		1	17-MAY-23
F-IC-N-WP								
	Water							
Batch	R5952039							
WG3784432-2	LCS							
Fluoride (F)			98.8		%		90-110	16-MAY-23
WG3784432-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	16-MAY-23
MET-T-CCMS-WP								
	Water							
Batch	R5952338							
WG3784451-4	DUP	WG3784451-3						
Aluminum (Al)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	17-MAY-23
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-MAY-23
Arsenic (As)-Total		0.00073	0.00073		mg/L	1.0	20	17-MAY-23
Barium (Ba)-Total		0.0148	0.0146		mg/L	1.4	20	17-MAY-23
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-MAY-23



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Page 3 of 11

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	R5952338							
WG3784451-4	DUP	WG3784451-3						
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-MAY-23
Boron (B)-Total		0.011	0.010		mg/L	3.6	20	17-MAY-23
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	17-MAY-23
Calcium (Ca)-Total		20.9	21.0		mg/L	0.9	20	17-MAY-23
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-MAY-23
Chromium (Cr)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-MAY-23
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-MAY-23
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-MAY-23
Iron (Fe)-Total		0.048	0.048		mg/L	0.7	20	17-MAY-23
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-MAY-23
Lithium (Li)-Total		0.0025	0.0025		mg/L	1.0	20	17-MAY-23
Magnesium (Mg)-Total		6.70	6.62		mg/L	1.2	20	17-MAY-23
Manganese (Mn)-Total		0.00385	0.00373		mg/L	3.0	20	17-MAY-23
Molybdenum (Mo)-Total		0.000155	0.000153		mg/L	1.1	20	17-MAY-23
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-MAY-23
Potassium (K)-Total		1.22	1.20		mg/L	1.4	20	17-MAY-23
Phosphorus (P)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	17-MAY-23
Rubidium (Rb)-Total		0.00162	0.00162		mg/L	0.2	20	17-MAY-23
Selenium (Se)-Total		<0.000050	0.000053	RPD-NA	mg/L	N/A	20	17-MAY-23
Silicon (Si)-Total		1.36	1.38		mg/L	1.3	20	17-MAY-23
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-MAY-23
Sodium (Na)-Total		2.31	2.29		mg/L	0.8	20	17-MAY-23
Strontium (Sr)-Total		0.0369	0.0367		mg/L	0.4	20	17-MAY-23
Sulfur (S)-Total		2.18	2.30		mg/L	5.3	20	17-MAY-23
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-MAY-23
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-MAY-23
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-MAY-23
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	17-MAY-23
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-MAY-23
Uranium (U)-Total		0.000050	0.000052		mg/L	3.7	20	17-MAY-23
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-MAY-23
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	17-MAY-23
Zirconium (Zr)-Total		<0.00020	<0.00020		mg/L			17-MAY-23



Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

Page 4 of 11

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	R5952338							
WG3784451-4	DUP	WG3784451-3						
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-MAY-23
WG3784451-2	LCS							
Aluminum (Al)-Total			106.9		%		80-120	17-MAY-23
Antimony (Sb)-Total			101.0		%		80-120	17-MAY-23
Arsenic (As)-Total			102.5		%		80-120	17-MAY-23
Barium (Ba)-Total			99.2		%		80-120	17-MAY-23
Beryllium (Be)-Total			107.6		%		80-120	17-MAY-23
Bismuth (Bi)-Total			100.6		%		80-120	17-MAY-23
Boron (B)-Total			103.1		%		80-120	17-MAY-23
Cadmium (Cd)-Total			100.2		%		80-120	17-MAY-23
Calcium (Ca)-Total			99.7		%		80-120	17-MAY-23
Cesium (Cs)-Total			99.1		%		80-120	17-MAY-23
Chromium (Cr)-Total			102.6		%		80-120	17-MAY-23
Cobalt (Co)-Total			100.0		%		80-120	17-MAY-23
Copper (Cu)-Total			102.2		%		80-120	17-MAY-23
Iron (Fe)-Total			89.6		%		80-120	17-MAY-23
Lead (Pb)-Total			99.2		%		80-120	17-MAY-23
Lithium (Li)-Total			104.8		%		80-120	17-MAY-23
Magnesium (Mg)-Total			117.0		%		80-120	17-MAY-23
Manganese (Mn)-Total			103.4		%		80-120	17-MAY-23
Molybdenum (Mo)-Total			103.1		%		80-120	17-MAY-23
Nickel (Ni)-Total			101.6		%		80-120	17-MAY-23
Potassium (K)-Total			103.6		%		80-120	17-MAY-23
Phosphorus (P)-Total			106.4		%		80-120	17-MAY-23
Rubidium (Rb)-Total			109.9		%		80-120	17-MAY-23
Selenium (Se)-Total			96.2		%		80-120	17-MAY-23
Silicon (Si)-Total			103.3		%		80-120	17-MAY-23
Silver (Ag)-Total			90.7		%		80-120	17-MAY-23
Sodium (Na)-Total			105.4		%		80-120	17-MAY-23
Strontium (Sr)-Total			97.5		%		80-120	17-MAY-23
Sulfur (S)-Total			97.3		%		80-120	17-MAY-23
Tellurium (Te)-Total			93.3		%		80-120	17-MAY-23
Thallium (Tl)-Total			98.8		%		80-120	17-MAY-23
Thorium (Th)-Total			97.7		%		80-120	17-MAY-23



Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

Page 5 of 11

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	R5952338							
WG3784451-2	LCS							
Titanium (Ti)-Total			100.3		%		80-120	17-MAY-23
Tungsten (W)-Total			95.4		%		80-120	17-MAY-23
Uranium (U)-Total			97.8		%		80-120	17-MAY-23
Vanadium (V)-Total			104.3		%		80-120	17-MAY-23
Zinc (Zn)-Total			99.8		%		80-120	17-MAY-23
Zirconium (Zr)-Total			95.0		%		80-120	17-MAY-23
WG3784451-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	17-MAY-23
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Arsenic (As)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Barium (Ba)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	17-MAY-23
Boron (B)-Total			<0.010		mg/L		0.01	17-MAY-23
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	17-MAY-23
Calcium (Ca)-Total			<0.050		mg/L		0.05	17-MAY-23
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	17-MAY-23
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Copper (Cu)-Total			<0.00050		mg/L		0.0005	17-MAY-23
Iron (Fe)-Total			<0.010		mg/L		0.01	17-MAY-23
Lead (Pb)-Total			<0.000050		mg/L		0.00005	17-MAY-23
Lithium (Li)-Total			<0.0010		mg/L		0.001	17-MAY-23
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	17-MAY-23
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	17-MAY-23
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	17-MAY-23
Potassium (K)-Total			<0.050		mg/L		0.05	17-MAY-23
Phosphorus (P)-Total			<0.030		mg/L		0.03	17-MAY-23
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	17-MAY-23
Selenium (Se)-Total			<0.000050		mg/L		0.00005	17-MAY-23
Silicon (Si)-Total			<0.10		mg/L		0.1	17-MAY-23
Silver (Ag)-Total			<0.000010		mg/L		0.00001	17-MAY-23
Sodium (Na)-Total			<0.050		mg/L		0.05	17-MAY-23



Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

Page 6 of 11

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	R5952338							
WG3784451-1	MB							
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	17-MAY-23
Sulfur (S)-Total			<0.50		mg/L		0.5	17-MAY-23
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	17-MAY-23
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	17-MAY-23
Thorium (Th)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	17-MAY-23
Tungsten (W)-Total			<0.00010		mg/L		0.0001	17-MAY-23
Uranium (U)-Total			<0.000010		mg/L		0.00001	17-MAY-23
Vanadium (V)-Total			<0.00050		mg/L		0.0005	17-MAY-23
Zinc (Zn)-Total			<0.0030		mg/L		0.003	17-MAY-23
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	17-MAY-23
WG3784451-5	MS	WG3784451-3						
Aluminum (Al)-Total			126.9		%		70-130	17-MAY-23
Antimony (Sb)-Total			113.1		%		70-130	17-MAY-23
Arsenic (As)-Total			127.8		%		70-130	17-MAY-23
Barium (Ba)-Total			125.9		%		70-130	17-MAY-23
Beryllium (Be)-Total			125.2		%		70-130	17-MAY-23
Bismuth (Bi)-Total			128.7		%		70-130	17-MAY-23
Boron (B)-Total			117.4		%		70-130	17-MAY-23
Cadmium (Cd)-Total			128.2		%		70-130	17-MAY-23
Calcium (Ca)-Total			N/A	MS-B	%		-	17-MAY-23
Cesium (Cs)-Total			122.9		%		70-130	17-MAY-23
Chromium (Cr)-Total			129.2		%		70-130	17-MAY-23
Cobalt (Co)-Total			127.7		%		70-130	17-MAY-23
Copper (Cu)-Total			125.7		%		70-130	17-MAY-23
Iron (Fe)-Total			119.2		%		70-130	17-MAY-23
Lead (Pb)-Total			125.0		%		70-130	17-MAY-23
Lithium (Li)-Total			121.6		%		70-130	17-MAY-23
Magnesium (Mg)-Total			N/A	MS-B	%		-	17-MAY-23
Manganese (Mn)-Total			126.4		%		70-130	17-MAY-23
Molybdenum (Mo)-Total			110.5		%		70-130	17-MAY-23
Nickel (Ni)-Total			124.6		%		70-130	17-MAY-23
Potassium (K)-Total			134.0	MES	%		70-130	17-MAY-23
Phosphorus (P)-Total			132.5	MES	%		70-130	17-MAY-23



Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

Page 7 of 11

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	R5952338							
WG3784451-5 MS		WG3784451-3						
Rubidium (Rb)-Total			131.8	MES	%		70-130	17-MAY-23
Selenium (Se)-Total			126.3		%		70-130	17-MAY-23
Silicon (Si)-Total			101.3		%		70-130	17-MAY-23
Silver (Ag)-Total			110.2		%		70-130	17-MAY-23
Sodium (Na)-Total			N/A	MS-B	%		-	17-MAY-23
Strontium (Sr)-Total			N/A	MS-B	%		-	17-MAY-23
Sulfur (S)-Total			116.7		%		70-130	17-MAY-23
Tellurium (Te)-Total			108.0		%		70-130	17-MAY-23
Thallium (Tl)-Total			121.9		%		70-130	17-MAY-23
Thorium (Th)-Total			128.8		%		70-130	17-MAY-23
Titanium (Ti)-Total			115.7		%		70-130	17-MAY-23
Tungsten (W)-Total			108.6		%		70-130	17-MAY-23
Uranium (U)-Total			123.3		%		70-130	17-MAY-23
Vanadium (V)-Total			129.1		%		70-130	17-MAY-23
Zinc (Zn)-Total			120.7		%		70-130	17-MAY-23
Zirconium (Zr)-Total			111.4		%		70-130	17-MAY-23
NH3-COL-WP								
	Water							
Batch	R5951996							
WG3784450-3 DUP		L2750659-2						
Ammonia, Total (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	16-MAY-23
WG3784450-2 LCS								
Ammonia, Total (as N)			96.0		%		85-115	16-MAY-23
WG3784450-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	16-MAY-23
WG3784450-4 MS		L2750659-2						
Ammonia, Total (as N)			94.3		%		75-125	16-MAY-23
NO2-L-IC-N-WP								
	Water							
Batch	R5952039							
WG3784432-3 DUP		L2750660-1						
Nitrite (as N)		0.0033	0.0033		mg/L	1.4	20	16-MAY-23
WG3784432-2 LCS								
Nitrite (as N)			101.3		%		90-110	16-MAY-23
WG3784432-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	16-MAY-23
WG3784432-4 MS		L2750660-1						



Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

Page 8 of 11

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								
Batch R5952039								
WG3784432-4	MS	L2750660-1	105.2		%		75-125	16-MAY-23
Nitrite (as N)								
NO3-L-IC-N-WP								
Batch R5952039								
WG3784432-3	DUP	L2750660-1	0.215		mg/L	0.5	20	16-MAY-23
Nitrate (as N)		0.214	0.215					
WG3784432-2	LCS		100.6		%		90-110	16-MAY-23
Nitrate (as N)								
WG3784432-1	MB		<0.0050		mg/L		0.005	16-MAY-23
Nitrate (as N)								
WG3784432-4	MS	L2750660-1	105.2		%		75-125	16-MAY-23
Nitrate (as N)								
PH-WP								
Batch R5952178								
WG3784445-5	DUP	L2750602-1	8.41	J	pH units	0.02	0.2	17-MAY-23
pH		8.39	8.41					
WG3784445-2	LCS		7.02		pH units		6.9-7.1	17-MAY-23
pH								
SO4-IC-N-WP								
Batch R5952039								
WG3784432-3	DUP	L2750660-1	303		mg/L	0.1	20	16-MAY-23
Sulfate (SO4)		303	303					
WG3784432-2	LCS		100.8		%		90-110	16-MAY-23
Sulfate (SO4)								
WG3784432-1	MB		<0.30		mg/L		0.3	16-MAY-23
Sulfate (SO4)								
WG3784432-4	MS	L2750660-1	N/A	MS-B	%		-	16-MAY-23
Sulfate (SO4)								
TDS-WP								
Batch R5952557								
WG3784490-3	DUP	L2750652-1	82		mg/L	3.7	20	18-MAY-23
Total Dissolved Solids		79	82					
WG3784490-2	LCS		94.6		%		85-115	18-MAY-23
Total Dissolved Solids								
WG3784490-1	MB		<4.0		mg/L		4	18-MAY-23
Total Dissolved Solids								

Quality Control Report

Workorder: L2750680

Report Date: 09-JUN-23

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

Page 10 of 11

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.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2750680

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CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8
Contact: DAVID EPLER

Page 11 of 11

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	16-MAY-23 10:30	17-MAY-23 07:27	0.25	21	hours	EHTR-FM
	2	16-MAY-23 09:30	17-MAY-23 07:27	0.25	22	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 L2750680 were received on 16-MAY-23 14:21.

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.



Environment, Climate and Parks
Office of Drinking Water
1007 Century Street, Winnipeg, Manitoba,
Canada R3H 0W4

Chain of Custody (COC)
Manitoba Drinking Water Systems



L2750680-COFC

Regular Service

Unless otherwise

3 Day, rush / priority

Report to Operator (email PDF):		Report to Owner (email PDF):		Email PDF copy to:	
Contact:	David Epler	Contact:	Chris Fulsher	DWO:	Amanda Fewings
Address:	6000 Portage Ave, Headingley, MB R4H 1E8	Address:	6000 Portage Avenue, Headingley, MB R4H 1E8	DWO Address:	14 Fultz Boulevard, Winnipeg, MB R3Y0L6
Phone:	(204) 832-2555	Phone:		DWO Phone:	(204) 795-9614
Email:	headingleywtp@crwc.ca; Tyler.Foxton2@gov.mb.ca	Email:	cfulsher@crwc.ca; headingleywtp@crwc.ca; tyler.foxton2@gov.mb.ca; dvaillant@crwc.ca	DWO Email:	amanda.fewings@gov.mb.ca
				Additional Email:	Joern.Muenster@gov.mb.ca; Melanie.Betsill@gov.mb.ca;

If an update in Owner or Operator contact information is required, please contact your Drinking Water Officer

Client / Project Information:	Lab:	Account:	Agency Code: 382	Report Type: EMS (Lab-MWS)	Project: DWQ-C
Operation Name:	HEADINGLEY REGIONAL - PWS		Expected Sample Time:	May-2023	
Operation Code:	89.40				
Operation ID:	57047				
Sampled by:	Paide Jensen				

Please record Free & Total Chlorine residuals for Distribution By-product Sampling
DO NOT COPY or RE-USE this form. Sample Number are unique to the Office of Drinking Water
and provided by Drinking Water Officer.

Sample Number	Station Number	Sample Identification	Free Chlorine (mg/L)	Total Chlorine (mg/L)	Sample Date dd-mmm-yyyy	Sample Time hh:mm	Sample Matrix	Sample Type	MB-CH-PWS-V2013	MB-MET-1-CCMS	# of Containers
2305AF5008	MB05MJD481	Headingley Regional 1 - Raw	—	—	16-MAY-2023	10:30am	6	1	X		4
2305AF5009	MB05MJD482	Headingley Regional 2 - Treated	1.38	1.42	16-MAY-2023	9:30am	10	1	X		4
2305AF5010	MB05MJD483	Headingley Regional 3 - Distribution - SFX RES. INCOMING	1.47	1.52	15-MAY-2023	1:50pm	9	1		X	1

Failure to complete all portions of this form may delay analysis.	Sample Matrix: 6-Raw Water, 9-Distributed Water, 10-Treated Water
Please fill in this form LEGIBLY.	Sample Type: 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.

Relinquished By:	<i>[Signature]</i>	Date & Time:	MAY 16 2023 02:00pm	Validated By (lab use only):	Date & Time:
Received By:		Date & Time:	MAY 16 2023	Temperature:	Samples Received in Good Condition?
(lab use only)		(lab use only)		15.8	Y / N

2:05 PM