



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

Date Received: 13-AUG-19
Report Date: 30-AUG-19 11:04 (MT)
Version: FINAL

Client Phone: 204-832-2555

Certificate of Analysis

Lab Work Order #: L2327772
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		L2327772-1	L2327772-2
		Sampled Date		13-AUG-19	13-AUG-19
		Sampled Time		10:34	09:15
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	17.6	<5.0
Conductivity	umhos/cm	-	-	1090	202
Hardness (as CaCO3)	mg/L	-	-	390 ^{HTC}	84.6 ^{HTC}
Langelier Index (4 C)	No Unit	-	-	1.3	-0.44
Langelier Index (60 C)	No Unit	-	-	2.0	0.34
pH	pH units	7.00-10.5	-	8.73	7.89
Total Dissolved Solids	mg/L	500	-	771	128
Transmittance, UV (254 nm)	%T/cm	-	-	60.5	99.8
Turbidity	NTU	-	-	44.8	<0.10

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2019)

#1: GCDWQ - Aesthetic Objective/Other Value

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Anions and Nutrients (WATER)

		ALS ID		L2327772-1	L2327772-2
		Sampled Date		13-AUG-19	13-AUG-19
		Sampled Time		10:34	09:15
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO3)	mg/L	-	-	272	59.1
Ammonia, Total (as N)	mg/L	-	-	0.010	<0.010
Bicarbonate (HCO3)	mg/L	-	-	290	72.1
Bromide (Br)	mg/L	-	-	0.091	<0.010
Carbonate (CO3)	mg/L	-	-	20.6	<0.60
Chloride (Cl)	mg/L	250	-	41.5	3.45
Fluoride (F)	mg/L	-	1.5	0.152	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	<0.010 ^{DLM}	0.0211
Nitrite (as N)	mg/L	-	1	<0.0020 ^{DLM}	<0.0010
Sulfate (SO4)	mg/L	500	-	303	40.0

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2019)

#1: GCDWQ - Aesthetic Objective/Other Value

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Organic / Inorganic Carbon (WATER)

		ALS ID		L2327772-1	L2327772-2
		Sampled Date		13-AUG-19	13-AUG-19
		Sampled Time		10:34	09:15
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	9.93	<0.50
Total Organic Carbon	mg/L	-	-	10.5	<0.50

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2019)

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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		L2327772-1	L2327772-2	L2327772-3
		Guide Limit #1	Guide Limit #2	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID
				13-AUG-19 10:34 HEADINGLEY REGIONAL 1 - RAW	13-AUG-19 09:15 HEADINGLEY REGIONAL 2 - TREATED	12-AUG-19 13:50 HEADINGLEY REGIONAL 3 - DISTRIBUTION GROSSE ISLE
Aluminum (Al)-Total	mg/L	0.1	-	0.832	0.0053	0.0036
Antimony (Sb)-Total	mg/L	-	0.006	0.00054	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.0106	0.00012	0.00103
Barium (Ba)-Total	mg/L	-	1	0.0834	0.00110	0.0107
Beryllium (Be)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	5	0.160	0.138	0.113
Cadmium (Cd)-Total	mg/L	-	0.005	0.0000604	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	-	-	77.0	32.7	12.3
Cesium (Cs)-Total	mg/L	-	-	0.000144	<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00171	0.00013	0.00059
Cobalt (Co)-Total	mg/L	-	-	0.00099	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	1	2	0.00434	0.00820	0.0188
Iron (Fe)-Total	mg/L	0.3	-	1.32	<0.010	<0.010
Lead (Pb)-Total	mg/L	-	0.005	0.00102	<0.000050	0.000101
Lithium (Li)-Total	mg/L	-	-	0.0720	0.0056	0.0169
Magnesium (Mg)-Total	mg/L	-	-	47.9	0.714	7.69
Manganese (Mn)-Total	mg/L	0.02	0.12	0.140	0.00654	0.00189
Molybdenum (Mo)-Total	mg/L	-	-	0.00439	<0.000050	0.000758
Nickel (Ni)-Total	mg/L	-	-	0.00577	<0.00050	0.00056
Phosphorus (P)-Total	mg/L	-	-	0.240	<0.030	0.394
Potassium (K)-Total	mg/L	-	-	15.0	0.733	3.38
Rubidium (Rb)-Total	mg/L	-	-	0.00487	<0.00020	0.00074
Selenium (Se)-Total	mg/L	-	0.05	0.000602	<0.000050	0.000092
Silicon (Si)-Total	mg/L	-	-	10.8	0.76	2.43
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	90.0	8.93	24.5
Strontium (Sr)-Total	mg/L	-	7	0.371	0.0674	0.0565
Sulfur (S)-Total	mg/L	-	-	103	14.0	15.4
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	0.000030	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-	0.00014	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2019)

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

Total Metals (WATER)

		ALS ID		L2327772-1	L2327772-2	L2327772-3
		Sampled Date		13-AUG-19	13-AUG-19	12-AUG-19
		Sampled Time		10:34	09:15	13:50
		Sample ID		HEADINGLEY	HEADINGLEY	HEADINGLEY
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED	REGIONAL 3 - DISTRIBUTION GROSSE ISLE
Titanium (Ti)-Total	mg/L	-	-	0.0277	<0.00030	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00340	0.000011	0.000345
Vanadium (V)-Total	mg/L	-	-	0.00791	<0.00050	0.00101
Zinc (Zn)-Total	mg/L	5	-	0.0160	0.0093	0.0149
Zirconium (Zr)-Total	mg/L	-	-	0.00082	<0.00020	<0.00020

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2019)

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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).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

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

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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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

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: L2327772

Report Date: 30-AUG-19

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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	R4754789							
WG3133358-15	DUP	L2327772-1						
Alkalinity, Total (as CaCO3)		272	274		mg/L	0.7	20	14-AUG-19
WG3133358-14	LCS							
Alkalinity, Total (as CaCO3)			103.3		%		85-115	14-AUG-19
WG3133358-11	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	14-AUG-19
BR-L-IC-N-WP								
	Water							
Batch	R4757445							
WG3132461-11	DUP	L2326678-1						
Bromide (Br)		0.056	0.056		mg/L	0.7	20	14-AUG-19
WG3132461-10	LCS							
Bromide (Br)			95.5		%		85-115	14-AUG-19
WG3132461-9	MB							
Bromide (Br)			<0.010		mg/L		0.01	14-AUG-19
WG3132461-12	MS	L2326678-1						
Bromide (Br)			101.5		%		75-125	14-AUG-19
C-DOC-HTC-WP								
	Water							
Batch	R4758889							
WG3136557-7	DUP	L2326486-9						
Dissolved Organic Carbon		<0.50	<0.50	RPD-NA	mg/L	N/A	20	16-AUG-19
WG3136557-6	LCS							
Dissolved Organic Carbon			101.5		%		80-120	16-AUG-19
WG3136557-5	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	16-AUG-19
WG3136557-8	MS	L2326486-10						
Dissolved Organic Carbon			103.0		%		70-130	16-AUG-19
Batch	R4759714							
WG3137743-3	DUP	L2327772-2						
Dissolved Organic Carbon		<0.50	<0.50	RPD-NA	mg/L	N/A	20	19-AUG-19
WG3137743-2	LCS							
Dissolved Organic Carbon			101.5		%		80-120	19-AUG-19
WG3137743-1	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	19-AUG-19
WG3137743-4	MS	L2328185-2						
Dissolved Organic Carbon			N/A	MS-B	%		-	19-AUG-19
C-TOC-HTC-WP								
	Water							



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 Headingley MB R4H 1E8

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP								
	Water							
Batch	R4759730							
WG3137758-7	DUP	L2326353-11						
Total Organic Carbon		5.78	6.01		mg/L	3.9	20	19-AUG-19
WG3137758-6	LCS							
Total Organic Carbon			108.8		%		80-120	19-AUG-19
WG3137758-5	MB							
Total Organic Carbon			<0.50		mg/L		0.5	19-AUG-19
WG3137758-8	MS	L2326353-12						
Total Organic Carbon			100.7		%		70-130	19-AUG-19
CL-L-IC-N-WP								
	Water							
Batch	R4757445							
WG3132461-11	DUP	L2326678-1						
Chloride (Cl)		14.9	14.9		mg/L	0.0	20	14-AUG-19
WG3132461-10	LCS							
Chloride (Cl)			98.8		%		90-110	14-AUG-19
WG3132461-9	MB							
Chloride (Cl)			<0.10		mg/L		0.1	14-AUG-19
WG3132461-12	MS	L2326678-1						
Chloride (Cl)			104.0		%		75-125	14-AUG-19
COLOUR-TRUE-WP								
	Water							
Batch	R4755712							
WG3133719-3	DUP	L2328106-1						
Colour, True		<5.0	<5.0	RPD-NA	CU	N/A	20	14-AUG-19
WG3133719-2	LCS							
Colour, True			99.6		%		85-115	14-AUG-19
WG3133719-1	MB							
Colour, True			<5.0		CU		5	14-AUG-19
EC-WP								
	Water							
Batch	R4754789							
WG3133358-15	DUP	L2327772-1						
Conductivity		1090	1080		umhos/cm	0.2	10	14-AUG-19
WG3133358-13	LCS							
Conductivity			97.7		%		90-110	14-AUG-19
WG3133358-11	MB							
Conductivity			<1.0		umhos/cm		1	14-AUG-19
F-IC-N-WP								
	Water							



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Client: Cartier Regional Water Co-op - Headingley Regional - PWS
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Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WP								
	Water							
Batch	R4757445							
WG3132461-11	DUP	L2326678-1						
Fluoride (F)		0.254	0.248		mg/L	2.1	20	14-AUG-19
WG3132461-10	LCS							
Fluoride (F)			103.0		%		90-110	14-AUG-19
WG3132461-9	MB							
Fluoride (F)			<0.020		mg/L		0.02	14-AUG-19
WG3132461-12	MS	L2326678-1						
Fluoride (F)			104.6		%		75-125	14-AUG-19
MET-T-CCMS-WP								
	Water							
Batch	R4762564							
WG3137707-2	LCS							
Aluminum (Al)-Total			101.0		%		80-120	21-AUG-19
Antimony (Sb)-Total			103.9		%		80-120	21-AUG-19
Arsenic (As)-Total			99.6		%		80-120	21-AUG-19
Barium (Ba)-Total			100.7		%		80-120	21-AUG-19
Beryllium (Be)-Total			115.5		%		80-120	21-AUG-19
Bismuth (Bi)-Total			101.2		%		80-120	21-AUG-19
Boron (B)-Total			104.5		%		80-120	21-AUG-19
Cadmium (Cd)-Total			100.7		%		80-120	21-AUG-19
Calcium (Ca)-Total			103.2		%		80-120	21-AUG-19
Cesium (Cs)-Total			101.6		%		80-120	21-AUG-19
Cobalt (Co)-Total			100.1		%		80-120	21-AUG-19
Copper (Cu)-Total			102.8		%		80-120	21-AUG-19
Iron (Fe)-Total			98.0		%		80-120	21-AUG-19
Lead (Pb)-Total			100.2		%		80-120	21-AUG-19
Lithium (Li)-Total			120.5	MES	%		80-120	21-AUG-19
Magnesium (Mg)-Total			103.3		%		80-120	21-AUG-19
Manganese (Mn)-Total			99.8		%		80-120	21-AUG-19
Nickel (Ni)-Total			98.7		%		80-120	21-AUG-19
Potassium (K)-Total			96.2		%		80-120	21-AUG-19
Phosphorus (P)-Total			100.4		%		80-120	21-AUG-19
Rubidium (Rb)-Total			100.3		%		80-120	21-AUG-19
Selenium (Se)-Total			102.5		%		80-120	21-AUG-19
Silicon (Si)-Total			100.0		%		80-120	21-AUG-19
Silver (Ag)-Total			99.1		%		80-120	21-AUG-19



Quality Control Report

Workorder: L2327772

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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	R4762564							
WG3137707-2 LCS								
Sodium (Na)-Total			107.1		%		80-120	21-AUG-19
Strontium (Sr)-Total			104.0		%		80-120	21-AUG-19
Sulfur (S)-Total			102.5		%		80-120	21-AUG-19
Tellurium (Te)-Total			95.6		%		80-120	21-AUG-19
Thallium (Tl)-Total			99.8		%		80-120	21-AUG-19
Thorium (Th)-Total			97.1		%		80-120	21-AUG-19
Tin (Sn)-Total			98.8		%		80-120	21-AUG-19
Titanium (Ti)-Total			97.5		%		80-120	21-AUG-19
Tungsten (W)-Total			99.3		%		80-120	21-AUG-19
Uranium (U)-Total			105.8		%		80-120	21-AUG-19
Vanadium (V)-Total			101.4		%		80-120	21-AUG-19
Zinc (Zn)-Total			100.1		%		80-120	21-AUG-19
Zirconium (Zr)-Total			96.6		%		80-120	21-AUG-19
WG3137707-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	21-AUG-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Boron (B)-Total			<0.010		mg/L		0.01	21-AUG-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	21-AUG-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	21-AUG-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Iron (Fe)-Total			<0.010		mg/L		0.01	21-AUG-19
Lead (Pb)-Total			<0.000050	B	mg/L		0.00005	21-AUG-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	21-AUG-19
Magnesium (Mg)-Total			0.0053	B	mg/L		0.005	21-AUG-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Potassium (K)-Total			<0.050		mg/L		0.05	21-AUG-19
Phosphorus (P)-Total			<0.030		mg/L		0.03	21-AUG-19



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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	R4762564							
WG3137707-1 MB								
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Silicon (Si)-Total			<0.10		mg/L		0.1	21-AUG-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Sodium (Na)-Total			<0.050		mg/L		0.05	21-AUG-19
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Sulfur (S)-Total			<0.50		mg/L		0.5	21-AUG-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	21-AUG-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-AUG-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	21-AUG-19
WG3137707-5 MS		WG3137707-3						
Aluminum (Al)-Total			91.6		%		70-130	21-AUG-19
Antimony (Sb)-Total			89.9		%		70-130	21-AUG-19
Arsenic (As)-Total			93.4		%		70-130	21-AUG-19
Barium (Ba)-Total			N/A	MS-B	%		-	21-AUG-19
Beryllium (Be)-Total			100.8		%		70-130	21-AUG-19
Bismuth (Bi)-Total			87.0		%		70-130	21-AUG-19
Boron (B)-Total			103.3		%		70-130	21-AUG-19
Cadmium (Cd)-Total			92.9		%		70-130	21-AUG-19
Calcium (Ca)-Total			N/A	MS-B	%		-	21-AUG-19
Cesium (Cs)-Total			91.1		%		70-130	21-AUG-19
Cobalt (Co)-Total			92.8		%		70-130	21-AUG-19
Copper (Cu)-Total			89.8		%		70-130	21-AUG-19
Iron (Fe)-Total			93.3		%		70-130	21-AUG-19
Lead (Pb)-Total			88.2		%		70-130	21-AUG-19
Lithium (Li)-Total			105.8		%		70-130	21-AUG-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	21-AUG-19



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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	R4762564							
WG3137707-5 MS		WG3137707-3						
Manganese (Mn)-Total			N/A	MS-B	%		-	21-AUG-19
Nickel (Ni)-Total			92.0		%		70-130	21-AUG-19
Potassium (K)-Total			92.8		%		70-130	21-AUG-19
Phosphorus (P)-Total			92.3		%		70-130	21-AUG-19
Rubidium (Rb)-Total			91.6		%		70-130	21-AUG-19
Selenium (Se)-Total			100.3		%		70-130	21-AUG-19
Silicon (Si)-Total			93.5		%		70-130	21-AUG-19
Silver (Ag)-Total			86.5		%		70-130	21-AUG-19
Sodium (Na)-Total			N/A	MS-B	%		-	21-AUG-19
Strontium (Sr)-Total			N/A	MS-B	%		-	21-AUG-19
Sulfur (S)-Total			N/A	MS-B	%		-	21-AUG-19
Tellurium (Te)-Total			88.3		%		70-130	21-AUG-19
Thallium (Tl)-Total			87.8		%		70-130	21-AUG-19
Thorium (Th)-Total			94.6		%		70-130	21-AUG-19
Tin (Sn)-Total			89.6		%		70-130	21-AUG-19
Titanium (Ti)-Total			95.4		%		70-130	21-AUG-19
Tungsten (W)-Total			90.1		%		70-130	21-AUG-19
Uranium (U)-Total			94.3		%		70-130	21-AUG-19
Vanadium (V)-Total			97.1		%		70-130	21-AUG-19
Zinc (Zn)-Total			88.4		%		70-130	21-AUG-19
Zirconium (Zr)-Total			93.1		%		70-130	21-AUG-19
Batch	R4762873							
WG3139147-4 DUP		WG3139147-3						
Aluminum (Al)-Total		0.0487	0.0484		mg/L	0.8	20	21-AUG-19
Antimony (Sb)-Total		0.00054	0.00052		mg/L	2.6	20	21-AUG-19
Arsenic (As)-Total		0.00073	0.00075		mg/L	1.9	20	21-AUG-19
Barium (Ba)-Total		0.0108	0.0107		mg/L	0.6	20	21-AUG-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-19
Boron (B)-Total		0.240	0.242		mg/L	0.9	20	21-AUG-19
Cadmium (Cd)-Total		0.0000074	0.0000073		mg/L	0.4	20	21-AUG-19
Calcium (Ca)-Total		68.0	69.6		mg/L	2.4	20	21-AUG-19
Cesium (Cs)-Total		0.000089	0.000091		mg/L	2.6	20	21-AUG-19



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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	R4762873							
WG3139147-4	DUP	WG3139147-3						
Chromium (Cr)-Total		0.00051	0.00048		mg/L	5.9	20	21-AUG-19
Cobalt (Co)-Total		0.00035	0.00035		mg/L	0.1	20	21-AUG-19
Copper (Cu)-Total		0.00096	0.00091		mg/L	5.3	20	21-AUG-19
Iron (Fe)-Total		0.018	0.018		mg/L	2.8	20	21-AUG-19
Lead (Pb)-Total		0.000169	0.000160		mg/L	5.3	20	21-AUG-19
Lithium (Li)-Total		0.0892	0.0901		mg/L	0.9	20	21-AUG-19
Magnesium (Mg)-Total		30.3	30.5		mg/L	0.5	20	21-AUG-19
Manganese (Mn)-Total		0.0246	0.0250		mg/L	1.6	20	21-AUG-19
Molybdenum (Mo)-Total		0.00345	0.00359		mg/L	4.1	20	21-AUG-19
Nickel (Ni)-Total		0.00295	0.00301		mg/L	2.3	20	21-AUG-19
Potassium (K)-Total		32.3	32.3		mg/L	0.2	20	21-AUG-19
Phosphorus (P)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	21-AUG-19
Rubidium (Rb)-Total		0.0271	0.0273		mg/L	0.9	20	21-AUG-19
Selenium (Se)-Total		0.000296	0.000274		mg/L	7.4	20	21-AUG-19
Silicon (Si)-Total		5.31	5.45		mg/L	2.5	20	21-AUG-19
Silver (Ag)-Total		0.000013	0.000017	J	mg/L	0.000003	0.00002	21-AUG-19
Sodium (Na)-Total		205	204		mg/L	0.2	20	21-AUG-19
Strontium (Sr)-Total		0.269	0.269		mg/L	0.1	20	21-AUG-19
Sulfur (S)-Total		138	139		mg/L	0.8	20	21-AUG-19
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-AUG-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	21-AUG-19
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-19
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-19
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	21-AUG-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-19
Uranium (U)-Total		0.000939	0.000946		mg/L	0.8	20	21-AUG-19
Vanadium (V)-Total		0.00075	0.00073		mg/L	2.5	20	21-AUG-19
Zinc (Zn)-Total		0.0340	0.0332		mg/L	2.5	20	21-AUG-19
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-AUG-19
WG3139147-2	LCS							
Aluminum (Al)-Total			99.5		%		80-120	21-AUG-19
Antimony (Sb)-Total			103.9		%		80-120	21-AUG-19
Arsenic (As)-Total			101.8		%		80-120	21-AUG-19



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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	R4762873							
WG3139147-2	LCS							
Barium (Ba)-Total			100.2		%		80-120	21-AUG-19
Beryllium (Be)-Total			101.2		%		80-120	21-AUG-19
Bismuth (Bi)-Total			98.4		%		80-120	21-AUG-19
Boron (B)-Total			99.0		%		80-120	21-AUG-19
Cadmium (Cd)-Total			100.6		%		80-120	21-AUG-19
Calcium (Ca)-Total			103.3		%		80-120	21-AUG-19
Cesium (Cs)-Total			106.2		%		80-120	21-AUG-19
Chromium (Cr)-Total			101.3		%		80-120	21-AUG-19
Cobalt (Co)-Total			101.8		%		80-120	21-AUG-19
Copper (Cu)-Total			103.0		%		80-120	21-AUG-19
Iron (Fe)-Total			96.5		%		80-120	21-AUG-19
Lead (Pb)-Total			103.7		%		80-120	21-AUG-19
Lithium (Li)-Total			103.8		%		80-120	21-AUG-19
Magnesium (Mg)-Total			106.3		%		80-120	21-AUG-19
Manganese (Mn)-Total			102.3		%		80-120	21-AUG-19
Molybdenum (Mo)-Total			102.5		%		80-120	21-AUG-19
Nickel (Ni)-Total			98.4		%		80-120	21-AUG-19
Potassium (K)-Total			96.9		%		80-120	21-AUG-19
Phosphorus (P)-Total			102.5		%		80-120	21-AUG-19
Rubidium (Rb)-Total			100.6		%		80-120	21-AUG-19
Selenium (Se)-Total			103.2		%		80-120	21-AUG-19
Silicon (Si)-Total			97.7		%		80-120	21-AUG-19
Silver (Ag)-Total			103.5		%		80-120	21-AUG-19
Sodium (Na)-Total			102.1		%		80-120	21-AUG-19
Strontium (Sr)-Total			107.1		%		80-120	21-AUG-19
Sulfur (S)-Total			92.7		%		80-120	21-AUG-19
Tellurium (Te)-Total			96.7		%		80-120	21-AUG-19
Thallium (Tl)-Total			100.3		%		80-120	21-AUG-19
Thorium (Th)-Total			98.5		%		80-120	21-AUG-19
Tin (Sn)-Total			99.2		%		80-120	21-AUG-19
Titanium (Ti)-Total			99.5		%		80-120	21-AUG-19
Tungsten (W)-Total			102.4		%		80-120	21-AUG-19
Uranium (U)-Total			105.4		%		80-120	21-AUG-19



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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	R4762873							
WG3139147-2	LCS							
Vanadium (V)-Total			102.4		%		80-120	21-AUG-19
Zinc (Zn)-Total			101.6		%		80-120	21-AUG-19
Zirconium (Zr)-Total			100.6		%		80-120	21-AUG-19
WG3139147-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	21-AUG-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Boron (B)-Total			<0.010		mg/L		0.01	21-AUG-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	21-AUG-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	21-AUG-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Iron (Fe)-Total			<0.010		mg/L		0.01	21-AUG-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	21-AUG-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	21-AUG-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Potassium (K)-Total			<0.050		mg/L		0.05	21-AUG-19
Phosphorus (P)-Total			<0.030		mg/L		0.03	21-AUG-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-AUG-19
Silicon (Si)-Total			<0.10		mg/L		0.1	21-AUG-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Sodium (Na)-Total			<0.050		mg/L		0.05	21-AUG-19
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	21-AUG-19
Sulfur (S)-Total			<0.50		mg/L		0.5	21-AUG-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	21-AUG-19



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Workorder: L2327772

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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	R4762873							
WG3139147-1 MB								
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	21-AUG-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	21-AUG-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	21-AUG-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-AUG-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-AUG-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	21-AUG-19
WG3139147-5 MS		WG3139147-3						
Aluminum (Al)-Total			91.6		%		70-130	21-AUG-19
Antimony (Sb)-Total			95.1		%		70-130	21-AUG-19
Arsenic (As)-Total			95.2		%		70-130	21-AUG-19
Barium (Ba)-Total			92.2		%		70-130	21-AUG-19
Beryllium (Be)-Total			93.5		%		70-130	21-AUG-19
Bismuth (Bi)-Total			88.5		%		70-130	21-AUG-19
Boron (B)-Total			N/A	MS-B	%		-	21-AUG-19
Cadmium (Cd)-Total			90.9		%		70-130	21-AUG-19
Calcium (Ca)-Total			N/A	MS-B	%		-	21-AUG-19
Cesium (Cs)-Total			94.5		%		70-130	21-AUG-19
Chromium (Cr)-Total			95.7		%		70-130	21-AUG-19
Cobalt (Co)-Total			91.3		%		70-130	21-AUG-19
Copper (Cu)-Total			89.1		%		70-130	21-AUG-19
Iron (Fe)-Total			89.8		%		70-130	21-AUG-19
Lead (Pb)-Total			90.8		%		70-130	21-AUG-19
Lithium (Li)-Total			82.3		%		70-130	21-AUG-19
Magnesium (Mg)-Total			N/A	MS-B	%		-	21-AUG-19
Manganese (Mn)-Total			N/A	MS-B	%		-	21-AUG-19
Molybdenum (Mo)-Total			100.8		%		70-130	21-AUG-19
Nickel (Ni)-Total			88.5		%		70-130	21-AUG-19
Potassium (K)-Total			N/A	MS-B	%		-	21-AUG-19
Phosphorus (P)-Total			97.1		%		70-130	21-AUG-19
Rubidium (Rb)-Total			N/A	MS-B	%		-	21-AUG-19
Selenium (Se)-Total			98.4		%		70-130	21-AUG-19



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	R4762873							
WG3139147-5 MS		WG3139147-3						
Silicon (Si)-Total			98.5		%		70-130	21-AUG-19
Silver (Ag)-Total			91.7		%		70-130	21-AUG-19
Sodium (Na)-Total			N/A	MS-B	%		-	21-AUG-19
Strontium (Sr)-Total			N/A	MS-B	%		-	21-AUG-19
Sulfur (S)-Total			N/A	MS-B	%		-	21-AUG-19
Tellurium (Te)-Total			91.1		%		70-130	21-AUG-19
Thallium (Tl)-Total			88.5		%		70-130	21-AUG-19
Thorium (Th)-Total			98.6		%		70-130	21-AUG-19
Tin (Sn)-Total			93.8		%		70-130	21-AUG-19
Titanium (Ti)-Total			96.5		%		70-130	21-AUG-19
Tungsten (W)-Total			96.2		%		70-130	21-AUG-19
Uranium (U)-Total			98.3		%		70-130	21-AUG-19
Vanadium (V)-Total			95.5		%		70-130	21-AUG-19
Zinc (Zn)-Total			90.5		%		70-130	21-AUG-19
Zirconium (Zr)-Total			100.7		%		70-130	21-AUG-19
Batch	R4778096							
WG3137686-4 DUP		WG3137686-3						
Aluminum (Al)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	29-AUG-19
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Arsenic (As)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Barium (Ba)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	29-AUG-19
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	29-AUG-19
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	29-AUG-19
Calcium (Ca)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	29-AUG-19
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-AUG-19
Chromium (Cr)-Total		0.00013	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	29-AUG-19
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	29-AUG-19
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	29-AUG-19
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	29-AUG-19



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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	R4778096							
WG3137686-4	DUP	WG3137686-3						
Magnesium (Mg)-Total		0.0167	0.0151		mg/L	10	20	29-AUG-19
Manganese (Mn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	29-AUG-19
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	29-AUG-19
Potassium (K)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	29-AUG-19
Phosphorus (P)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	29-AUG-19
Rubidium (Rb)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	29-AUG-19
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	29-AUG-19
Silicon (Si)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	29-AUG-19
Silver (Ag)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-AUG-19
Sodium (Na)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	29-AUG-19
Strontium (Sr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	29-AUG-19
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	29-AUG-19
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	29-AUG-19
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-AUG-19
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	29-AUG-19
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	29-AUG-19
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	29-AUG-19
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	29-AUG-19
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	29-AUG-19
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	29-AUG-19
WG3137686-2	LCS							
Aluminum (Al)-Total			99.5		%		80-120	29-AUG-19
Antimony (Sb)-Total			102.8		%		80-120	29-AUG-19
Arsenic (As)-Total			97.5		%		80-120	29-AUG-19
Barium (Ba)-Total			100.6		%		80-120	29-AUG-19
Beryllium (Be)-Total			100.3		%		80-120	29-AUG-19
Bismuth (Bi)-Total			97.2		%		80-120	29-AUG-19
Boron (B)-Total			101.3		%		80-120	29-AUG-19
Cadmium (Cd)-Total			99.7		%		80-120	29-AUG-19
Calcium (Ca)-Total			100.0		%		80-120	29-AUG-19



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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	R4778096							
WG3137686-2	LCS							
Cesium (Cs)-Total			96.4		%		80-120	29-AUG-19
Chromium (Cr)-Total			98.0		%		80-120	29-AUG-19
Cobalt (Co)-Total			94.5		%		80-120	29-AUG-19
Copper (Cu)-Total			94.2		%		80-120	29-AUG-19
Iron (Fe)-Total			95.3		%		80-120	29-AUG-19
Lead (Pb)-Total			100.8		%		80-120	29-AUG-19
Lithium (Li)-Total			100.4		%		80-120	29-AUG-19
Magnesium (Mg)-Total			95.2		%		80-120	29-AUG-19
Manganese (Mn)-Total			97.5		%		80-120	29-AUG-19
Molybdenum (Mo)-Total			101.2		%		80-120	29-AUG-19
Nickel (Ni)-Total			96.4		%		80-120	29-AUG-19
Potassium (K)-Total			98.2		%		80-120	29-AUG-19
Phosphorus (P)-Total			101.0		%		80-120	29-AUG-19
Rubidium (Rb)-Total			95.6		%		80-120	29-AUG-19
Selenium (Se)-Total			96.7		%		80-120	29-AUG-19
Silicon (Si)-Total			99.96		%		80-120	29-AUG-19
Silver (Ag)-Total			99.8		%		80-120	29-AUG-19
Sodium (Na)-Total			96.1		%		80-120	29-AUG-19
Strontium (Sr)-Total			98.9		%		80-120	29-AUG-19
Sulfur (S)-Total			96.2		%		80-120	29-AUG-19
Tellurium (Te)-Total			93.5		%		80-120	29-AUG-19
Thallium (Tl)-Total			100.7		%		80-120	29-AUG-19
Thorium (Th)-Total			94.8		%		80-120	29-AUG-19
Tin (Sn)-Total			99.5		%		80-120	29-AUG-19
Titanium (Ti)-Total			95.4		%		80-120	29-AUG-19
Tungsten (W)-Total			100.5		%		80-120	29-AUG-19
Uranium (U)-Total			97.5		%		80-120	29-AUG-19
Vanadium (V)-Total			98.5		%		80-120	29-AUG-19
Zinc (Zn)-Total			96.0		%		80-120	29-AUG-19
Zirconium (Zr)-Total			95.6		%		80-120	29-AUG-19
WG3137686-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	29-AUG-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	29-AUG-19



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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	R4778096							
WG3137686-1 MB								
Barium (Ba)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	29-AUG-19
Boron (B)-Total			<0.010		mg/L		0.01	29-AUG-19
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	29-AUG-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	29-AUG-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	29-AUG-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	29-AUG-19
Iron (Fe)-Total			<0.010		mg/L		0.01	29-AUG-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	29-AUG-19
Lithium (Li)-Total			<0.0010		mg/L		0.001	29-AUG-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	29-AUG-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	29-AUG-19
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	29-AUG-19
Potassium (K)-Total			<0.050		mg/L		0.05	29-AUG-19
Phosphorus (P)-Total			<0.030		mg/L		0.03	29-AUG-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	29-AUG-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	29-AUG-19
Silicon (Si)-Total			<0.10		mg/L		0.1	29-AUG-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	29-AUG-19
Sodium (Na)-Total			<0.050		mg/L		0.05	29-AUG-19
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	29-AUG-19
Sulfur (S)-Total			<0.50		mg/L		0.5	29-AUG-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	29-AUG-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	29-AUG-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	29-AUG-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	29-AUG-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	29-AUG-19



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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	R4778096							
WG3137686-1 MB								
Vanadium (V)-Total			<0.00050		mg/L		0.0005	29-AUG-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	29-AUG-19
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	29-AUG-19
WG3137686-5 MS		WG3137686-3						
Aluminum (Al)-Total			90.1		%		70-130	29-AUG-19
Antimony (Sb)-Total			94.1		%		70-130	29-AUG-19
Arsenic (As)-Total			93.5		%		70-130	29-AUG-19
Barium (Ba)-Total			95.9		%		70-130	29-AUG-19
Beryllium (Be)-Total			88.9		%		70-130	29-AUG-19
Bismuth (Bi)-Total			92.3		%		70-130	29-AUG-19
Boron (B)-Total			94.6		%		70-130	29-AUG-19
Cadmium (Cd)-Total			93.5		%		70-130	29-AUG-19
Calcium (Ca)-Total			90.5		%		70-130	29-AUG-19
Cesium (Cs)-Total			88.8		%		70-130	29-AUG-19
Chromium (Cr)-Total			92.3		%		70-130	29-AUG-19
Cobalt (Co)-Total			92.3		%		70-130	29-AUG-19
Copper (Cu)-Total			92.9		%		70-130	29-AUG-19
Iron (Fe)-Total			92.7		%		70-130	29-AUG-19
Lead (Pb)-Total			95.1		%		70-130	29-AUG-19
Lithium (Li)-Total			89.2		%		70-130	29-AUG-19
Magnesium (Mg)-Total			91.0		%		70-130	29-AUG-19
Manganese (Mn)-Total			90.9		%		70-130	29-AUG-19
Molybdenum (Mo)-Total			96.3		%		70-130	29-AUG-19
Nickel (Ni)-Total			92.5		%		70-130	29-AUG-19
Potassium (K)-Total			95.2		%		70-130	29-AUG-19
Phosphorus (P)-Total			92.1		%		70-130	29-AUG-19
Rubidium (Rb)-Total			92.7		%		70-130	29-AUG-19
Selenium (Se)-Total			94.0		%		70-130	29-AUG-19
Silicon (Si)-Total			90.4		%		70-130	29-AUG-19
Silver (Ag)-Total			92.4		%		70-130	29-AUG-19
Sodium (Na)-Total			91.1		%		70-130	29-AUG-19
Strontium (Sr)-Total			90.2		%		70-130	29-AUG-19
Sulfur (S)-Total			91.1		%		70-130	29-AUG-19
Tellurium (Te)-Total			92.9		%		70-130	29-AUG-19



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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	
NO3-L-IC-N-WP	Water								
Batch R4757445									
WG3132461-9 MB Nitrate (as N)			<0.0050		mg/L		0.005	14-AUG-19	
WG3132461-12 MS Nitrate (as N)		L2326678-1	103.6		%		75-125	14-AUG-19	
PH-WP	Water								
Batch R4754789									
WG3133358-15 DUP pH		L2327772-1	8.73	8.71	J	pH units	0.02	0.2	14-AUG-19
WG3133358-12 LCS pH			7.44			pH units	7.3-7.5	14-AUG-19	
SO4-IC-N-WP	Water								
Batch R4757445									
WG3132461-11 DUP Sulfate (SO4)		L2326678-1	111	110		mg/L	0.6	20	14-AUG-19
WG3132461-10 LCS Sulfate (SO4)			100.5			%	90-110	14-AUG-19	
WG3132461-9 MB Sulfate (SO4)			<0.30			mg/L	0.3	14-AUG-19	
WG3132461-12 MS Sulfate (SO4)		L2326678-1	N/A		MS-B	%	-	14-AUG-19	
TDS-WP	Water								
Batch R4758737									
WG3133517-7 DUP Total Dissolved Solids		L2327385-2	1630	1550		mg/L	5.2	20	16-AUG-19
WG3133517-6 LCS Total Dissolved Solids			99.0			%	85-115	16-AUG-19	
WG3133517-5 MB Total Dissolved Solids			<4.0			mg/L	4	16-AUG-19	
TURBIDITY-WP	Water								
Batch R4754571									
WG3132584-3 DUP Turbidity		L2327772-1	44.8	44.7		NTU	0.2	15	14-AUG-19
WG3132584-2 LCS Turbidity			104.5			%	85-115	14-AUG-19	
WG3132584-1 MB Turbidity			<0.10			NTU	0.1	14-AUG-19	
UV-%TRANS-WP	Water								



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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
UV-%TRANS-WP								
	Water							
Batch	R4752650							
WG3132392-3	DUP	L2326678-2						
Transmittance, UV (254 nm)		99.8	99.5		%T/cm	0.2	20	14-AUG-19
WG3132392-1	IRM	BLANK						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	14-AUG-19
WG3132392-2	LCS							
Transmittance, UV (254 nm)			86.2		%		85-115	14-AUG-19

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Contact: DAVID EPLER

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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
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
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.

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Workorder: L2327772

Report Date: 30-AUG-19

Client: Cartier Regional Water Co-op - Headingley Regional - PWS
CRWC - Headingley Regional - PWS 6000 Portage Avenue
Headingley MB R4H 1E8
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	13-AUG-19 10:34	14-AUG-19 12:00	0.25	25	hours	EHTR-FM
	2	13-AUG-19 09:15	14-AUG-19 12:00	0.25	27	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 L2327772 were received on 13-AUG-19 14:54.

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.



L2327772-COFC

L2327772

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

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			<input checked="" type="checkbox"/>		.1 Day, rush./priority				
Address:	6000 Portage Avenue Headingley MB R4H 1E8			Address:	Unit #1A - 2010 Currie Blvd. Brandon MB R7B 4E7			<input type="checkbox"/>		2 Day, rush / priority				
Phone:	204-832-2555			Phone:	204-728-6075			Unless otherwise requested:		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; Joem.Muenster@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				MB-CH-PWS-V2013	Total Metals	Number of Containers	
Lab:	Lab Work Order # / Job # (lab use only)				Operation Code (com code):	89.40								
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						
	1908KB0057	MB05MJD481	Headingley - Raw		13/Aug/2019	10:34	6	1	X					4
	1908KB0058	MB05MJD482	Headingley - Treated		13/Aug/2019	9:15	10	1	X		4			
	1908KB0059	MB05MJD483	Headingley - Distribution - GLOSSE TSLC		13/Aug/2019	1:50	9	1		X	1			
Failure to complete all portions of this form may delay analysis.								Sample Matrix:		Sample Type:				
								6-Raw Water, 9-Distributed Water, 10-Treated Water, 11-Drinking Water		1-Grab Sample, 33-Resample, 3-Duplicate Sample, 22-Field Blank				
Please fill in this form LEGIBLY .														
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory.														
For <u>ALL</u> 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:	Date & Time:		Sample Condition (lab use only)		Temperature						
			CW	2:54 13-8-19				Samples Received in Good Condition? Y / N (if no provide details)						
Relinquished By:	Date & Time:		Received By:	Date & Time:				9.4						

Operator mandatory

Operator optional

Operator to fill, if information above has changed

Opr to fill, Lab specific

pre-filled by DWO