



Cartier Regional Water Co-op - Headingley  
Regional - PWS  
ATTN: DAVID EPLER  
CRWC - Headingley Regional - PWS  
Box 217  
St. Eustache MB R0H 1H0

Date Received: 21-JUN-16  
Report Date: 29-JUN-16 14:14 (MT)  
Version: FINAL

Client Phone: 204-832-2555

## Certificate of Analysis

Lab Work Order #: L1786476  
Project P.O. #: 57047  
Job Reference: HEADINGLEY REGIONAL - PWS 89.40  
C of C Numbers:  
Legal Site Desc: 57047



Hua Wo  
Chemistry Laboratory Manager

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## Physical Tests (WATER)

		ALS ID		L1786476-1	L1786476-2
		Sampled Date		21-JUN-16	21-JUN-16
		Sampled Time		09:30	09:30
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	19.4	<5.0
Conductivity	umhos/cm	-	-	883	230
Hardness (as CaCO <sub>3</sub> )	mg/L	-	-	389	82.9
Langelier Index (4 C)	No Unit	-	-	0.91	-0.72
Langelier Index (60 C)	No Unit	-	-	1.7	0.055
pH	pH units	6.5-8.5	-	8.39	7.29
Total Dissolved Solids	mg/L	500	-	621	149
Transmittance, UV (254 nm)	%T/cm	-	-	54.5	97.3
Turbidity	NTU	-	-	23.3	0.13

## Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

## Anions and Nutrients (WATER)

		ALS ID		L1786476-1	L1786476-2
		Sampled Date		21-JUN-16	21-JUN-16
		Sampled Time		09:30	09:30
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	-	-	227	124
Ammonia, Total (as N)	mg/L	-	-	0.240	<0.010
Bicarbonate (HCO <sub>3</sub> )	mg/L	-	-	268	151
Bromide (Br)	mg/L	-	-	<0.10	<0.10
Carbonate (CO <sub>3</sub> )	mg/L	-	-	4.56	<0.60
Chloride (Cl)	mg/L	250	-	29.2	1.53
Fluoride (F)	mg/L	-	1.5	0.183	<0.020
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.121	0.0149
Nitrite (as N)	mg/L	-	1	0.0189	<0.0010
Sulfate (SO <sub>4</sub> )	mg/L	500	-	218	<0.30

## Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

## Organic / Inorganic Carbon (WATER)

		ALS ID		L1786476-1	L1786476-2
		Sampled Date		21-JUN-16	21-JUN-16
		Sampled Time		09:30	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	-	-	10.1	<0.50
Total Organic Carbon	mg/L	-	-	9.44	<0.50

## Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

# ANALYTICAL REPORT

## Total Metals (WATER)

		ALS ID		L1786476-1	L1786476-2
		Sampled Date		21-JUN-16	21-JUN-16
		Sampled Time		09:30	09:30
		Sample ID		HEADINGLEY	HEADINGLEY
				REGIONAL 1 -	REGIONAL 2 -
Analyte	Unit	Guide Limit #1	Guide Limit #2	RAW	TREATED
Aluminum (Al)-Total	mg/L	0.1	-	1.28	<0.0050
Antimony (Sb)-Total	mg/L	-	0.006	0.00030	<0.00020
Arsenic (As)-Total	mg/L	-	0.01	<0.00020	<0.00020
Barium (Ba)-Total	mg/L	-	1	0.0619	0.00269
Beryllium (Be)-Total	mg/L	-	-	<0.00020	<0.00020
Bismuth (Bi)-Total	mg/L	-	-	<0.00020	<0.00020
Boron (B)-Total	mg/L	-	5	0.085	0.062
Cadmium (Cd)-Total	mg/L	-	0.005	0.000022	<0.000010
Calcium (Ca)-Total	mg/L	-	-	81.5	32.3
Cesium (Cs)-Total	mg/L	-	-	0.00013	<0.00010
Chromium (Cr)-Total	mg/L	-	0.05	0.0016	<0.0010
Cobalt (Co)-Total	mg/L	-	-	0.00051	<0.00020
Copper (Cu)-Total	mg/L	1	-	0.0119	0.0262
Iron (Fe)-Total	mg/L	0.3	-	0.970	<0.010
Lead (Pb)-Total	mg/L	-	0.01	0.000439	0.000824
Lithium (Li)-Total	mg/L	-	-	0.0566	0.0041
Magnesium (Mg)-Total	mg/L	-	-	45.0	0.518
Manganese (Mn)-Total	mg/L	0.05	-	0.0318	0.00881
Molybdenum (Mo)-Total	mg/L	-	-	0.00341	<0.00020
Nickel (Ni)-Total	mg/L	-	-	0.0044	<0.0020
Phosphorus (P)-Total	mg/L	-	-	<0.10	<0.10
Potassium (K)-Total	mg/L	-	-	10.8	1.01
Rubidium (Rb)-Total	mg/L	-	-	0.00348	0.00035
Selenium (Se)-Total	mg/L	-	0.05	<0.0010	<0.0010
Silicon (Si)-Total	mg/L	-	-	8.39	0.22
Silver (Ag)-Total	mg/L	-	-	<0.00010	<0.00010
Sodium (Na)-Total	mg/L	200	-	50.8	23.3
Strontium (Sr)-Total	mg/L	-	-	0.351	0.0966
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.00010	<0.00010
Thorium (Th)-Total	mg/L	-	-	0.00027	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00020	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.0432	<0.00050

## Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

# ANALYTICAL REPORT

## Total Metals (WATER)

		ALS ID		L1786476-1	L1786476-2
		Sampled Date		21-JUN-16	21-JUN-16
		Sampled Time		09:30	09:30
		Sample ID		HEADINGLEY REGIONAL 1 - RAW	HEADINGLEY REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00529	<0.00010
Vanadium (V)-Total	mg/L	-	-	0.00669	<0.00020
Zinc (Zn)-Total	mg/L	5	-	0.0036	0.0075
Zirconium (Zr)-Total	mg/L	-	-	0.00190	<0.00040

## Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)

#1: GCDWQ - Aesthetic Objective

#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

## Reference Information

## Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
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**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<sub>3</sub> 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<sub>3</sub>-/L

**ALK-OH-OH-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<sub>3</sub>) 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<sub>3</sub><sup>-</sup> and H<sub>2</sub>CO<sub>3</sub> endpoints indicated electrometrically.

**BR-IC-N-WP** Water Bromide in Water by IC EPA 300.1 (mod)

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<sub>2</sub> 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<sub>2</sub> 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-HARDNESS-TOT-WP** Water Hardness Calculated HARDNESS CALCULATED

**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.

**IONBALANCE-CALC-WP** Water Ion Balance Calculation APHA 1030E

**MET-T-L-MS-WP** Water Total Metals by ICP-MS APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

**NH3-COL-WP** Water Ammonia by colour APHA 4500 NH<sub>3</sub> 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.

Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

## Reference Information

### Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
<b>NO2-L-IC-N-WP</b>	Water		
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
<b>NO3-L-IC-N-WP</b>	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.			
<b>PH-WP</b>	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.			
<b>SO4-IC-N-WP</b>	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
<b>TDS-WP</b>	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.			
<b>TURBIDITY-WP</b>	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			
<b>UV-%TRANS-WP</b>	Water	UV Transmittance (Calculated)	APHA 5910B
Test method is adapted from APHA Method 5910B. A sample is filtered through a 0.45 um 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

### 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 ww - 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.*





**Environmental**

## Quality Control Report

Workorder: L1786476

Report Date: 29-JUN-16

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-WP		Water						
Batch	R3488603							
WG2333024-1	MB							
Chloride (Cl)			<0.10		mg/L		0.1	22-JUN-16
COLOUR-TRUE-WP		Water						
Batch	R3487775							
WG2333984-3	DUP	L1786476-1						
Colour, True		19.4	19.0		CU	1.6	20	22-JUN-16
WG2333984-2	LCS							
Colour, True			100.7		%		85-115	22-JUN-16
WG2333984-1	MB							
Colour, True			<5.0		CU		5	22-JUN-16
EC-WP		Water						
Batch	R3491942							
WG2337353-15	DUP	L1786396-1						
Conductivity		3690	3720		umhos/cm	0.8	10	28-JUN-16
WG2337353-13	LCS							
Conductivity			96.7		%		90-110	28-JUN-16
WG2337353-11	MB							
Conductivity			<1.0		umhos/cm		1	28-JUN-16
F-IC-N-WP		Water						
Batch	R3488603							
WG2333024-3	DUP	L1786461-1						
Fluoride (F)		0.797	0.796		mg/L	0.1	20	22-JUN-16
WG2333024-2	LCS							
Fluoride (F)			104.3		%		90-110	22-JUN-16
WG2333024-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	22-JUN-16
WG2333024-4	MS	L1786461-1						
Fluoride (F)			103.4		%		75-125	22-JUN-16
MET-T-L-MS-WP		Water						
Batch	R3488384							
WG2333598-4	DUP	WG2333598-3						
Aluminum (Al)-Total		0.172	0.168		mg/L	2.2	20	23-JUN-16
Antimony (Sb)-Total		0.00118	0.00110		mg/L	7.8	20	23-JUN-16
Arsenic (As)-Total		0.00185	0.00178		mg/L	4.0	20	23-JUN-16
Barium (Ba)-Total		0.0188	0.0187		mg/L	0.7	20	23-JUN-16
Beryllium (Be)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-JUN-16



## Quality Control Report

Workorder: L1786476

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-L-MS-WP</b>		<b>Water</b>						
<b>Batch</b>	<b>R3488384</b>							
<b>WG2333598-4</b>	<b>DUP</b>	<b>WG2333598-3</b>						
Bismuth (Bi)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-JUN-16
Boron (B)-Total		0.045	0.042		mg/L	6.5	20	23-JUN-16
Cadmium (Cd)-Total		0.0245	0.0239		mg/L	2.5	20	23-JUN-16
Calcium (Ca)-Total		529	521		mg/L	1.4	20	23-JUN-16
Cesium (Cs)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-JUN-16
Chromium (Cr)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	23-JUN-16
Cobalt (Co)-Total		0.138	0.142		mg/L	2.4	20	23-JUN-16
Copper (Cu)-Total		2.15	2.10		mg/L	2.0	20	23-JUN-16
Iron (Fe)-Total		4.13	4.08		mg/L	1.0	20	23-JUN-16
Lead (Pb)-Total		0.000355	0.000358		mg/L	0.6	20	23-JUN-16
Lithium (Li)-Total		0.0161	0.0156		mg/L	2.9	20	23-JUN-16
Magnesium (Mg)-Total		54.5	53.4		mg/L	2.1	20	23-JUN-16
Manganese (Mn)-Total		9.71	9.52		mg/L	2.0	20	23-JUN-16
Molybdenum (Mo)-Total		0.0136	0.0135		mg/L	0.9	20	23-JUN-16
Nickel (Ni)-Total		0.376	0.366		mg/L	2.5	20	23-JUN-16
Phosphorus (P)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	23-JUN-16
Potassium (K)-Total		21.4	21.4		mg/L	0.2	20	23-JUN-16
Rubidium (Rb)-Total		0.00974	0.00977		mg/L	0.2	20	23-JUN-16
Selenium (Se)-Total		0.0013	0.0012		mg/L	4.8	20	23-JUN-16
Silicon (Si)-Total		7.30	7.38		mg/L	1.2	20	23-JUN-16
Silver (Ag)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-JUN-16
Sodium (Na)-Total		62.2	61.1		mg/L	1.9	20	23-JUN-16
Strontium (Sr)-Total		1.41	1.42		mg/L	0.2	20	23-JUN-16
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-JUN-16
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-JUN-16
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-JUN-16
Tin (Sn)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-JUN-16
Titanium (Ti)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	23-JUN-16
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-JUN-16
Uranium (U)-Total		0.00056	0.00056		mg/L	1.1	20	23-JUN-16
Vanadium (V)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-JUN-16
Zinc (Zn)-Total		4.33	4.26		mg/L	1.8	20	23-JUN-16
Zirconium (Zr)-Total		<0.00040	<0.00040		mg/L			23-JUN-16

## Quality Control Report

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-L-MS-WP</b>		<b>Water</b>						
<b>Batch</b>	<b>R3488384</b>							
<b>WG2333598-4 DUP</b>		<b>WG2333598-3</b>						
Zirconium (Zr)-Total		<0.00040	<0.00040	RPD-NA	mg/L	N/A	20	23-JUN-16
<b>WG2333598-2 LCS</b>								
Aluminum (Al)-Total			104.5		%		80-120	23-JUN-16
Antimony (Sb)-Total			95.7		%		80-120	23-JUN-16
Arsenic (As)-Total			96.7		%		80-120	23-JUN-16
Barium (Ba)-Total			104.6		%		80-120	23-JUN-16
Beryllium (Be)-Total			100.3		%		80-120	23-JUN-16
Bismuth (Bi)-Total			95.3		%		80-120	23-JUN-16
Boron (B)-Total			100.9		%		80-120	23-JUN-16
Cadmium (Cd)-Total			97.2		%		80-120	23-JUN-16
Calcium (Ca)-Total			102.0		%		80-120	23-JUN-16
Cesium (Cs)-Total			92.1		%		80-120	23-JUN-16
Chromium (Cr)-Total			99.1		%		80-120	23-JUN-16
Cobalt (Co)-Total			96.6		%		80-120	23-JUN-16
Copper (Cu)-Total			93.4		%		80-120	23-JUN-16
Iron (Fe)-Total			100.2		%		80-120	23-JUN-16
Lead (Pb)-Total			99.3		%		80-120	23-JUN-16
Lithium (Li)-Total			98.3		%		80-120	23-JUN-16
Magnesium (Mg)-Total			101.1		%		80-120	23-JUN-16
Manganese (Mn)-Total			102.7		%		80-120	23-JUN-16
Molybdenum (Mo)-Total			104.1		%		80-120	23-JUN-16
Nickel (Ni)-Total			95.8		%		80-120	23-JUN-16
Phosphorus (P)-Total			104.1		%		80-120	23-JUN-16
Potassium (K)-Total			102.7		%		80-120	23-JUN-16
Rubidium (Rb)-Total			103.3		%		80-120	23-JUN-16
Selenium (Se)-Total			97.9		%		80-120	23-JUN-16
Silicon (Si)-Total			104.7		%		80-120	23-JUN-16
Silver (Ag)-Total			99.2		%		80-120	23-JUN-16
Sodium (Na)-Total			102.2		%		80-120	23-JUN-16
Strontium (Sr)-Total			107.9		%		80-120	23-JUN-16
Tellurium (Te)-Total			99.0		%		80-120	23-JUN-16
Thallium (Tl)-Total			98.9		%		80-120	23-JUN-16
Thorium (Th)-Total			95.9		%		80-120	23-JUN-16
Tin (Sn)-Total			97.5		%		80-120	23-JUN-16



Environmental

## Quality Control Report

Workorder: L1786476

Report Date: 29-JUN-16

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-T-L-MS-WP</b>		<b>Water</b>						
<b>Batch</b>	<b>R3488384</b>							
<b>WG2333598-2</b>	<b>LCS</b>							
Titanium (Ti)-Total			102.7		%		80-120	23-JUN-16
Tungsten (W)-Total			100.8		%		80-120	23-JUN-16
Uranium (U)-Total			104.4		%		80-120	23-JUN-16
Vanadium (V)-Total			104.8		%		80-120	23-JUN-16
Zinc (Zn)-Total			96.1		%		80-120	23-JUN-16
Zirconium (Zr)-Total			101.2		%		80-120	23-JUN-16
<b>WG2333598-1</b>	<b>MB</b>							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	23-JUN-16
Antimony (Sb)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Arsenic (As)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Barium (Ba)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Beryllium (Be)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Bismuth (Bi)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Boron (B)-Total			<0.010		mg/L		0.01	23-JUN-16
Cadmium (Cd)-Total			<0.000010		mg/L		0.00001	23-JUN-16
Calcium (Ca)-Total			<0.10		mg/L		0.1	23-JUN-16
Cesium (Cs)-Total			<0.00010		mg/L		0.0001	23-JUN-16
Chromium (Cr)-Total			<0.0010		mg/L		0.001	23-JUN-16
Cobalt (Co)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Copper (Cu)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Iron (Fe)-Total			<0.010		mg/L		0.01	23-JUN-16
Lead (Pb)-Total			<0.000090		mg/L		0.00009	23-JUN-16
Lithium (Li)-Total			<0.0020		mg/L		0.002	23-JUN-16
Magnesium (Mg)-Total			<0.010		mg/L		0.01	23-JUN-16
Manganese (Mn)-Total			<0.00030		mg/L		0.0003	23-JUN-16
Molybdenum (Mo)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Nickel (Ni)-Total			<0.0020		mg/L		0.002	23-JUN-16
Phosphorus (P)-Total			<0.10		mg/L		0.1	23-JUN-16
Potassium (K)-Total			<0.020		mg/L		0.02	23-JUN-16
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	23-JUN-16
Selenium (Se)-Total			<0.0010		mg/L		0.001	23-JUN-16
Silicon (Si)-Total			<0.10		mg/L		0.1	23-JUN-16
Silver (Ag)-Total			<0.00010		mg/L		0.0001	23-JUN-16
Sodium (Na)-Total			<0.030		mg/L		0.03	23-JUN-16





**Environmental**

## Quality Control Report

Workorder: L1786476

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Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0

Contact: DAVID EPLER

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>PH-WP</b>		<b>Water</b>						
Batch	R3491942							
WG2337353-15	DUP	L1786396-1						
pH		7.34	7.32	J	pH units	0.02	0.2	28-JUN-16
WG2337353-12	LCS							
pH			7.41		pH units		7.3-7.5	28-JUN-16
<b>SO4-IC-N-WP</b>		<b>Water</b>						
Batch	R3488603							
WG2333024-2	LCS							
Sulfate (SO4)			101.5		%		90-110	22-JUN-16
WG2333024-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	22-JUN-16
<b>TDS-WP</b>		<b>Water</b>						
Batch	R3490004							
WG2333036-3	DUP	L1786412-1						
Total Dissolved Solids		783	767		mg/L	2.1	20	23-JUN-16
WG2333036-2	LCS							
Total Dissolved Solids			95.3		%		85-115	23-JUN-16
WG2333036-1	MB							
Total Dissolved Solids			<10		mg/L		10	23-JUN-16
WG2333036-5	MB							
Total Dissolved Solids			<4.0		mg/L		4	23-JUN-16
<b>TURBIDITY-WP</b>		<b>Water</b>						
Batch	R3487383							
WG2333620-3	DUP	L1785682-1						
Turbidity		3.68	3.50		NTU	5.0	15	21-JUN-16
WG2333620-2	LCS							
Turbidity			96.5		%		85-115	21-JUN-16
WG2333620-1	MB							
Turbidity			<0.10		NTU		0.1	21-JUN-16
<b>UV-%TRANS-WP</b>		<b>Water</b>						
Batch	R3490997							
WG2334000-3	DUP	L1786476-1						
Transmittance, UV (254 nm)		54.5	54.3		%T/cm	0.2	20	23-JUN-16
WG2334000-1	IRM	BLANK						
Transmittance, UV (254 nm)			100.0		%		99.5-100.5	23-JUN-16
WG2334000-2	LCS							
Transmittance, UV (254 nm)			107.6		%		85-115	23-JUN-16

# Quality Control Report

Workorder: L1786476

Report Date: 29-JUN-16

Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0

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Contact: DAVID EPLER

## Legend:

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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:

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Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
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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# Quality Control Report

Workorder: L1786476

Report Date: 29-JUN-16

Client: Cartier Regional Water Co-op - Headingley Regional - PWS  
CRWC - Headingley Regional - PWS Box 217  
St. Eustache MB R0H 1H0  
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
<b>Physical Tests</b>							
pH	1	21-JUN-16 09:30	28-JUN-16 10:10	0.25	169	hours	EHTR-FM
	2	21-JUN-16 09:30	28-JUN-16 10:10	0.25	169	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 L1786476 were received on 21-JUN-16 13:40.

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.



L1786476-COFC

Manitoba Conservation Water Stewardship  
Office of Drinking Water  
1007 Century Street, Winnipeg, Manitoba, Canada  
R3H 0W4

Manit  
ONLY FOR: Regulatory General Chemistry & VOC Samples

<b>Report to Operator (email pdf):</b>				<b>Owner billing (Email):</b>				<b>Regular Service (default):</b>		<b>Regular Service (is 5-7 Days):</b>	
Contact:	David Epler, Lead Operator - CRWC - Headingley			Contact:	Kim Davey, MWSB			Unless otherwise requested:		<input type="checkbox"/> 1 Day, rush / priority	
Address:	Box 217 St. Eustache MB R0H 1H0			Address:	Unit 1A - 2010 Currie Blvd. Brandon MB R7B 4E7					<input type="checkbox"/> 2 Day, rush / priority	
Phone:	204-832-2555			Phone:	204-729-6094					<input type="checkbox"/> 3 Day, rush / priority	
Email:	headingleywp@crwc.ca; angela.meier@gov.mb.ca			Email:	kim.davey@gov.mb.ca						
<b>Operator contact update (if different then above):</b>				<b>Owner contact update (if different then above):</b>				<b>Email pdf copy to:</b>			
Contact:				Contact:				DWO:	John Cronk		
Address:				Address:				DWO Address:	309 - 25 Tupper St. N. Portage la Prairie MB R1N 3K1		
Phone:				Phone:				DWO Phone:	204-239-3186		
Email:				Email:				DWO Email:	john.cronk@gov.mb.ca		
Account:	W7374	ODW Report type:	EMS (Lab-MWS)	<b>Client / Project Information:</b>				<b>Analysis Request</b>			
Agency Code:	382	Project:	DWQ-C	Operation Name:	HEADINGLEY REGIONAL - PWS			MB-CH-PWS-V2013  Number of Containers			
Lab:	ALS	Lab Work Order # / Job # (lab use only)		Operation Code (com code):	89.40						
				Operation Id:	57047						
				Sampled by:	David Epler						
Lab Sample # (lab use only)	Sample Number (YYMMJJ9999)	Station Number (MB99XXD9999) / (MB99XXV9999)	Sample Identification	Date dd-mmm-yyyy	Time hh:mm	Sample Matrix	Sample Type				
	1606JC0027	MB05MJD481	Headingley regional 1 - Raw	21/06/16	9:30 AM	6	1	X			
	1606JC0028	MB05MJD482	Headingley regional 2 - Treated	21/06/16	9:30 AM	10	1	X			
Failure to complete all portions of this form may delay analysis.				Sample Matrix:				Sample Type:			
Please fill in this form <b>LEGIBLY</b> .				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.											
<b>DO NOT COPY or RE-USE this form. Sample Numbers are unique to the Office of Drinking Water and provided by DWO.</b>											
Relinquished By:	<i>[Signature]</i>	Date & Time: June 21/2016		Received By: <i>[Signature]</i>	Date & Time: June 21/2016	Sample Condition (lab use only)					
				(lab use only)	(lab use only)	1:40pm					
							Temperature	Samples Received in Good Condition? Y / N (if no provide details)			
Relinquished By:	<i>[Signature]</i>	Date & Time: June 21/2016		Received By:	Date & Time:		15°C				
				(lab use only)	(lab use only)						

Operator mandatory

Operator optional

Operator to fill, if information above has changed

Opr to fill, Lab specific

pre-filled by DWO

**Note:** Cyanide and Mercury are not required and have been removed from the list.

Please use the Rev. July 29, 2013 Water System Chemistry List.