



Manitoba Water Services Board - CRWC
ATTN: GRANT MCGORMAN
Cartier Regional Water Co-op
Box 217
St. Eustache MB R0H 1H0

Date Received: 07-APR-20
Report Date: 15-APR-20 11:32 (MT)
Version: FINAL

Client Phone: 204-353-4055

Certificate of Analysis

Lab Work Order #: L2434775
Project P.O. #: NOT SUBMITTED
Job Reference: CARTIER REGIONAL - PWS 36.00
C of C Numbers:
Legal Site Desc: 28128

Hua Wo
Chemistry Laboratory Manager

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ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ANALYTICAL REPORT

Physical Tests (WATER)

		ALS ID		L2434775-1	L2434775-2
		Sampled Date		06-APR-20	06-APR-20
		Sampled Time		14:15	14:15
		Sample ID		CARTIER	CARTIER
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED
Colour, True	CU	15	-	14.5	<5.0
Conductivity	umhos/cm	-	-	1110	316
Hardness (as CaCO3)	mg/L	-	-	511 ^{HTC}	99.6 ^{HTC}
Langelier Index (4 C)	No Unit	-	-	0.84	-1.0
Langelier Index (60 C)	No Unit	-	-	1.6	-0.24
pH	pH units	7.00-10.5	-	8.12	7.40
Total Dissolved Solids	mg/L	500	-	736	168
Transmittance, UV (254 nm)	%T/cm	-	-	58.5	92.7
Turbidity	NTU	-	-	4.94	<0.10

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)

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

#2: GCDWQ - Maximum Acceptable Concentrations (Pre-2003)

Anions and Nutrients (WATER)

		ALS ID		L2434775-1	L2434775-2
		Sampled Date		06-APR-20	06-APR-20
		Sampled Time		14:15	14:15
		Sample ID		CARTIER	CARTIER
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-	322	84.6
Ammonia, Total (as N)	mg/L	-	-	0.018	0.022
Bicarbonate (HCO3)	mg/L	-	-	393	103
Bromide (Br)	mg/L	-	-	0.115	<0.010
Carbonate (CO3)	mg/L	-	-	<0.60	<0.60
Chloride (Cl)	mg/L	250	-	30.8	9.44
Fluoride (F)	mg/L	-	1.5	0.168	0.249
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	0.753	0.329
Nitrite (as N)	mg/L	-	1	0.0033	<0.0010
Sulfate (SO4)	mg/L	500	-	286	64.8

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)

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

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Organic / Inorganic Carbon (WATER)

		ALS ID		L2434775-1	L2434775-2
		Sampled Date		06-APR-20	06-APR-20
		Sampled Time		14:15	14:15
		Sample ID		CARTIER	CARTIER
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED
Dissolved Organic Carbon	mg/L	-	-	8.29	1.52
Total Organic Carbon	mg/L	-	-	8.77	1.58

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)

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#2: GCDWQ - Maximum Acceptable Concentrations (Pre-2003)

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		L2434775-1	L2434775-2	L2434775-3
		Guide Limit #1	Guide Limit #2	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID
				06-APR-20 14:15 CARTIER REGIONAL 1 - RAW	06-APR-20 14:15 CARTIER REGIONAL 2 - TREATED	06-APR-20 14:25 CARTIER REGIONAL 3 - DISTRIBUTION
Aluminum (Al)-Total	mg/L	0.1	-	0.0752	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.006	0.00017	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00419	0.00099	0.00083
Barium (Ba)-Total	mg/L	-	2	0.104	0.0184	0.0193
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	-	-	0.126	0.107	0.098
Cadmium (Cd)-Total	mg/L	-	0.005	0.0000147	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	-	-	97.9	19.9	18.7
Cesium (Cs)-Total	mg/L	-	-	0.000018	<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	0.00017	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.00019	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	1	-	0.0214	0.0458	0.00465
Iron (Fe)-Total	mg/L	0.3	-	0.178	<0.010	0.021
Lead (Pb)-Total	mg/L	-	0.005	0.000114	<0.000050	<0.000050
Lithium (Li)-Total	mg/L	-	-	0.0669	0.0172	0.0161
Magnesium (Mg)-Total	mg/L	-	-	64.7	12.1	12.4
Manganese (Mn)-Total	mg/L	0.02	0.12	0.0165	0.00110	0.00036
Molybdenum (Mo)-Total	mg/L	-	-	0.00292	0.000555	0.000519
Nickel (Ni)-Total	mg/L	-	-	0.00348	0.00066	0.00067
Phosphorus (P)-Total	mg/L	-	-	0.313	0.404	0.352
Potassium (K)-Total	mg/L	-	-	14.1	3.03	3.09
Rubidium (Rb)-Total	mg/L	-	-	0.00262	0.00057	0.00056
Selenium (Se)-Total	mg/L	-	0.05	0.000539	0.000188	0.000104
Silicon (Si)-Total	mg/L	-	-	10.7	2.61	2.60
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	87.0	33.1	33.1
Strontium (Sr)-Total	mg/L	-	7	0.433	0.0860	0.0795
Sulfur (S)-Total	mg/L	-	-	113	23.8	23.9
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	0.000013	<0.000010	<0.000010
Thorium (Th)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010

Federal Guidelines for Canadian Drinking Water Quality (JAN, 2020)

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		Sample ID		CARTIER	CARTIER	CARTIER
Analyte	Unit	Guide Limit #1	Guide Limit #2	REGIONAL 1 - RAW	REGIONAL 2 - TREATED	REGIONAL 3 - DISTRIBUTION
Titanium (Ti)-Total	mg/L	-	-	0.00222	<0.00030	<0.00030
Tungsten (W)-Total	mg/L	-	-	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	-	0.02	0.00431	0.000861	0.000802
Vanadium (V)-Total	mg/L	-	-	0.00133	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	5	-	0.0054	0.0033	<0.0030
Zirconium (Zr)-Total	mg/L	-	-	0.00030	<0.00020	<0.00020

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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).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
<p>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 CO₃ 2-/L.</p>			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
<p>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 HCO₃-/L.</p>			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
<p>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.</p>			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO ₃)	APHA 2320B
<p>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 HCO₃- and H₂CO₃ endpoints indicated electrometrically.</p>			
BR-L-IC-N-WP	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)-LR
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP
<p>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 CO₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.</p>			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
<p>Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO₂ which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.</p>			
CL-L-IC-N-WP	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
COLOUR-TRUE-WP	Water	Colour, True	APHA 2120C
<p>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.</p>			
EC-WP	Water	Conductivity	APHA 2510B
<p>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.</p>			
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)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p>			
HARDNESS-CALC-WP	Water	Hardness Calculated	APHA 2340B
<p>Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.</p>			
IONBALANCE-CALC-WP	Water	Ion Balance Calculation	APHA 1030E
<p>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.</p>			

Reference Information

Methods Listed (if applicable):

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

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

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

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



L2434775-COFC

Regular Service (default):	<input checked="" type="checkbox"/> Regular Service (is 5-7 Days):
Unless otherwise requested	<input type="checkbox"/> 1 Day, rush / priority
	<input type="checkbox"/> 2 Day, rush / priority
	<input type="checkbox"/> 3 Day, rush / priority

Report to Operator (email PDF):
 Contact: Grant McGorman
 Address: Box 217, St. Eustache, MB R0H 1H0
 Phone: (204) 353-4055
 Email: dvaillant@crwc.ca; cartierwtp@crwc.ca; gmcgorman@crwc.ca

Report to Owner (email PDF):
 Contact: Robert Poirier
 Address: 6000 Portage Avenue, Headingley, MB R4H 1E8
 Phone: (204) 832-2555
 Email: robertpoirier@icloud.com; cartierwtp@crwc.ca; angela.meier@gov.mb.ca

Email PDF copy to:
 DWO: Kale Black
 DWO Address: 309-25 Tupper St. N, Portage la Prairie, MB
 DWO Phone: (204) 795-6908
 DWO Email: Kale.Black@gov.mb.ca
 Additional Email: Joern.Muenster@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: CARTIER REGIONAL - PWS	Expected Sample Time:		April-2020		
Operation Code: 36.00					
Operation ID: 28128					
Sampled by: Grant McGorman					

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
2004KB5001	MB05MJD041	Cartier Regional 1 - Raw	—	—	06-APR-2020	2:15PM	6	1	X		4
2004KB5002	MB05MJD042	Cartier Regional 2 - Treated	1.56	1.74	06-APR-2020	2:15PM	10	1	X		4
2004KB5003	MB05MJD043	Cartier Regional 3 - Distribution	1.41	1.62	06-APR-2020	2:25pm	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: Grant McGorman	Date & Time: April 7/2020 @ 10:30 AM	Validated By (lab use only):	Date & Time:
Received By: AN	Date & Time: 7 April 1040	Temperature: 11.9	Samples Received in Good Condition? (Y/N)