

Public Water System Annual Report

-2021-

Name of the Public Water System: **South Central District Water Co-op**

Name of the Legal Owner: **South Central District Water Co-operative Inc.**

Contact Person: **Brent Checkley, Board Chairperson**

Phone: **(204) 825-7000**

Emergency number: **(204) 245-9101**

Name of Lead Operator: **Mr. Keith Klassen**

Name of Back-up Operator: **Mr. Don Deamal**

Phone during business hours: **(204) 825-2115**

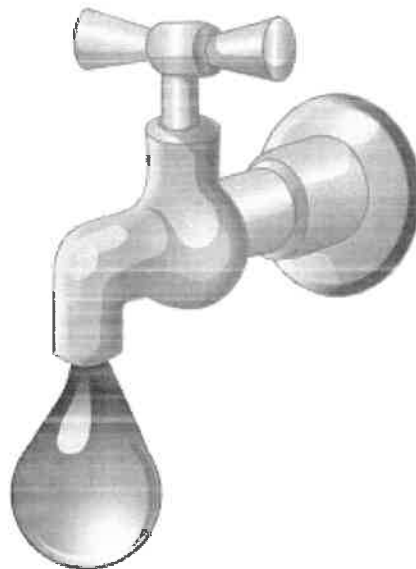


Date Prepared: March 2021

Brent Checkley
Board Chairperson
South Central District Water Co-op Inc.

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1. Introduction:

The 2021 South Central District Water Co-op Annual Report summarizes the water utility's ability to provide safe potable water and comply with provincial regulations.

2. Description of the Water System

The South Central District Water Co-op provides potable drinking water to a population of approximately 1800 residents. No corrective actions or emergency reporting was required. Full results have been attached in Appendix A.

The South Central District Water Co-op water system consists of two wells, raw water supply pipeline, water treatment plant (WTP), and a treated water transmission pipeline to the water storage reservoir in the town of Manitou (located in the R.M. of Pembina).

2.1. *Water Supply Source*

The South Central District Water Co-op receives its raw water supply from two groundwater wells, located approximately 15 km west of the WTP on SE 30-3-12W. One well can supply the system when one treatment skid is operating, and the second well supplements the supply when both treatment skids are operating.

The system provides treated water to the towns of Pilot Mound and Manitou, and some rural connections along the transmission pipeline.

2.2 *Water Treatment Process*

The treatment system is comprised of: two parallel RO membrane filtration skids; manganese greensand bypass filter with UV disinfection. The treatment system ensures that the water meets the *Guidelines for Canadian Drinking Water Quality* and the provincial *Drinking Water Safety Act*.

The water treatment process is designed to reduce iron and manganese concentrations, and reduce hardness to an acceptable level. Iron and manganese are metals that cause laundry and plumbing fixture staining problems, and can build up in the distribution pipes and cause reduced flow. Calcium carbonate (CaCO_3) causes hardness in water which diminishes the ability of the water to react with soap and form lather. Hardness also forms scale deposits in kettles and hot water tanks which can reduce the life expectancy of these appliances. Since membranes are capable of removing most of the hardness ions, a percentage of the raw water bypasses the membrane system and is filtered through a manganese greensand pressure filter. Water passing through the pressure filter continues through the UV

process and is then blended with membrane permeate to produce the desired finished water hardness.

Potassium Permanganate is injected prior to the green sand filter to oxidize iron and manganese. Iron is precipitated and filtered out, while manganese is removed mostly by adsorption within the green sand layer of the pressure filter.

Antiscalant is injected in the membrane raw water supply to minimize RO membrane fouling by sequestering dissolved metals and minerals during the treatment and concentrate phases. Since membranes remove dissolved minerals, water stabilization through pH adjustment is required to produce a non-corrosive treated water supply.

Chlorine for disinfection is added to maintain an adequate free chlorine residual concentration in the reservoir. Plant operators are required to test the water several times throughout the day at various points within the WTP to ensure break-point chlorination required for water safety is being achieved.

Treated water is stored in a 150,000 Imperial gallon, three-cell reinforced concrete reservoir. The reservoir is equipped with ultrasonic level control and monitored with a SCADA system.

2.3 Classification and Certification

The South Central District Water System is classified as a Level II Water Treatment Facility with a Level I Distribution System under the Manitoba Water and Wastewater Facility operators Regulation 77/2003. Facility classifications are used to determine certification requirements for the water system operators. The full-time operator is certified Level II Water Treatment. The relief operator is Level I Water Treatment, working towards Class II certification. Both operators are certified Level I in Water Distribution.

3. List of Water Quality Standards and Monitoring Requirements

The Province of Manitoba has adopted a number of water quality standards from the Health Canada *Guidelines for Canadian Drinking Water Quality* (see Table 1). The health-based parameters express the maximum acceptable concentrations for drinking water. Concentration values in excess of the guidelines constitute a health-related issue and require corrective actions. All health-based parameters were within the limits in 2021 for the South Central District Water System.

Table 1: Health-Based Parameters

Parameter	Quality Standard
Total coliform	Less than one total coliform bacteria detectable per 100 mL in all treated and distributed water
<i>E. coli</i>	Less than one <i>E. coli</i> bacteria detectable per 100 mL in all treated and distributed water
Chlorine residual	A free chlorine residual of at least 0.5 mg/L in water entering the distribution system following a minimum contact time of 20 minutes
Turbidity	Less than or equal to 0.1 NTU in 99% of the measurements in a month of the effluent from each membrane filtration unit Not exceed 0.3 NTU for any measurement
Ultraviolet Disinfection	95% of water produced per month is disinfected within validated conditions
Arsenic	Less than or equal to 0.01 mg/L
Benzene	Less than or equal to 0.005 mg/L
Fluoride	Less than or equal to 1.5 mg/L
Lead	Less than or equal to 0.01 mg/L in the water distribution system
Nitrate	Less than or equal to 45 mg/L measured as nitrate (10 mg/L measured as nitrogen)
Trichloroethylene	Less than or equal to 0.005 mg/L
Tetrachloroethylene	Less than or equal to 0.03 mg/L
Uranium	Less than or equal to 0.02 mg/L

Public water systems are required to monitor chlorine levels and undertake regular bacterial testing. The South Central District system met all requirements 100% for water quality standards and monitoring requirements in 2021, and is fulfilling the requirements of the Operating Licence.

Table 2: Water Quality Monitoring Requirements

Parameter	Monitoring Requirement
Bacteriological (total coliform and <i>E. coli</i>)	Biweekly sampling program with each set of samples consisting of one raw, one treated, and a minimum of two distribution samples. Distribution samples are to be taken from the following locations: - Water entering the Manitou reservoir (incoming) - Water leaving the Manitou reservoir (outgoing) Consecutive sample sets to be separated by at least 12 days
Free chlorine (treated water)	Continuous sampling of water entering the distribution system following at least 20 minutes of contact time at the Pilot Mound reservoir A confirmatory sample to be taken daily at the online chlorine analyzer sampling or effluent point at the Pilot Mound reservoir One sample per day of water leaving the Manitou reservoir
Total chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time Pilot Mound reservoir One sample per day of water leaving the Manitou reservoir
Ultraviolet Disinfection	Continuous monitoring of UV intensity level for each operating UV unit
Turbidity	One raw water sample per day Continuous sampling of the effluent from each operating membrane filtration unit A confirmatory sample to be taken daily at the online turbidity analyzer sampling or effluent point
General chemistry (parameter list provided by Office of Drinking Water)	One raw and one treated water sample once each year
Lead	As per the instructions of the Drinking Water Officer

The Manitoba health-based standards for Trihalomethanes (THM) and Haloacetic Acids (HAA) are 100 µg/L (micrograms per liter) and 80 µg/L, respectively. Both THM and HAA are by-products of disinfection, where chlorine combines with trace amounts of organics in the water. Although the Co-op is not required to sample for THM and HAA, the Municipality of Louise is required to do so and the results are shown in Appendix A. The average THM is 6.1 µg/L and HAA levels are undetectable in their distribution system.

4. Water System Incidents and Corrective Actions

There were no major water system incidents in 2021. There were no corrective actions or emergency reporting required.

5. Drinking Water Safety Orders, Warnings, and Charges

There were no Drinking Water Safety Orders or warnings issued, nor were any charges laid on the system.

6. Major Expenses Incurred

There were no major expenses for the South Central District Water System in 2021.

7. Future System Expansion

The South Central District Water Co-op member municipalities plan to continue expansion of their distribution networks as funding opportunities arise and finances are available.

Appendix A

Results of Water Chemistry, Bacterial and Chlorine Residual Analysis



Chlorine Residual and Bacterial (TC/EC) Analyses

Collection Date	Sample Identification	TC	EC	CL2 Free	CL2 Total
2021-01-05	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.71
2021-01-05	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.97	1.07
2021-01-05	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-01-05	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.82
2021-01-19	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.67	0.72
2021-01-19	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.98	1.10
2021-01-19	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-01-19	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.74	0.80
2021-02-02	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.69	0.72
2021-02-02	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.87	0.93
2021-02-02	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-02-02	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.82
2021-02-16	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.63	0.69
2021-02-16	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.11	1.12
2021-02-16	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-02-16	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.73	0.81
2021-03-02	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.70	0.71
2021-03-02	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.03	1.05
2021-03-02	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-03-02	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.67	0.75
2021-03-16	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.72
2021-03-16	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.16	1.17
2021-03-16	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-03-16	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.81
2021-03-30	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.72	0.74
2021-03-30	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.96	0.98
2021-03-30	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-03-30	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.70	0.81
2021-04-13	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.70
2021-04-13	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.87	0.93
2021-04-13	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-04-13	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.74	0.81
2021-04-27	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.71
2021-04-27	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.05	1.12
2021-04-27	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-04-27	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.71	0.82

Chlorine Residual and TC/EC Analyses (continued)

Collection Date	Sample Identification	TC	EC	CL2 Free	CL2 Total
2021-05-11	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.74
2021-05-11	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.03	1.15
2021-05-11	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-05-11	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.70	0.79
2021-05-25	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.69
2021-05-25	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.80	0.85
2021-05-25	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-05-25	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.81
2021-06-08	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.55	0.70
2021-06-08	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.24	1.25
2021-06-08	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-06-08	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.73	0.82
2021-06-22	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.69	0.75
2021-06-22	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.89	0.98
2021-06-22	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-06-22	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.71	0.81
2021-07-06	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.62	0.65
2021-07-06	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.98	1.04
2021-07-06	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-07-06	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.70	0.81
2021-07-20	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.69	0.70
2021-07-20	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.82	0.86
2021-07-20	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-07-20	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.79
2021-08-03	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.67	0.70
2021-08-03	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.05	1.07
2021-08-03	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-08-03	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.69	0.79
2021-08-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.72
2021-08-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.12	1.22
2021-08-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-08-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.71	0.81
2021-08-31	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.49	0.70
2021-08-31	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.03	1.10
2021-08-31	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-08-31	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.71	0.80

Chlorine Residual and TC/EC Analyses (continued)

Collection Date	Sample Identification	TC	EC	CL2 Free	CL2 Total
2021-09-14	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.66
2021-09-14	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.01	1.03
2021-09-14	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-09-14	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.79
2021-09-28	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.67	0.69
2021-09-28	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.02	1.06
2021-09-28	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-09-28	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.83
2021-10-12	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.69
2021-10-12	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.95	1.03
2021-10-12	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-10-12	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.73	0.86
2021-10-26	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.63	0.69
2021-10-26	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.90	0.97
2021-10-26	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-10-26	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.73	0.84
2021-11-09	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.71
2021-11-09	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.86	0.96
2021-11-09	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-11-09	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.82
2021-11-23	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.71
2021-11-23	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.64	0.69
2021-11-23	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-11-23	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.75	0.86
2021-12-07	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.65	0.68
2021-12-07	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.94	0.98
2021-12-07	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-12-07	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.73	0.85
2021-12-21	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.65	0.71
2021-12-21	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.01	1.08
2021-12-21	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
2021-12-21	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.82

Notes:

CL2: Reported in units of mg/L

TC/EC: Reported in units of MPN/100 mL

NDSF: No Data - Sample Received Frozen

Trihalomethane (THM) 2021 Results

WATER SYSTEM NAME	CODE	FEB	MAY	AUG	NOV	AVG THM (µg/L)
Municipality of Louise	120.00	4.8	3.6	7.6	8.4	6.1
(Source— South Central District Co-Op - 203.75)						

Notes:

- All results reported in µg/l
- THM Annual Average Maximum Allowable Concentration = 100 µg/l

Haloacetic Acids (HAA) 2021 Results

WATER SYSTEM NAME	CODE	MAR	MAY	AUG	NOV	AVG HAA (µg/L)
Municipality of Louise	120.00	<5.4 (DL)	<5.4 (DL)	<5.4 (DL)	<1.8 (DL)	<4.5 (DL)
(Source— South Central District Co-Op – 203.75)						

Notes:

- All results reported in µg/l
- HAA Annual Average Maximum Allowable Concentration = 80 µg/l
- DL = Detection Limit (ie. No detectable HAA in the water)

2021 Water Chemistry



Municipality of Louise - South Central
Regional-PWS
ATTN: SOUTH CENTRAL DISTRICT WATER
CO-OP
Box 310
Crystal City MB R0K 0N0

Date Received: 24-NOV-21
Report Date: 30-NOV-21 11:45 (MT)
Version: FINAL

Client Phone: 204-873-2591

Certificate of Analysis

Lab Work Order #: L2665711
Project P.O. #: NOT SUBMITTED
Job Reference: SOUTH CENTRAL REGIONAL - PWS 203.75
C of C Numbers:
Legal Site Desc: 59047

Hua Wo
Chemistry Laboratory Manager

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Water Chemistry (continued):



ANALYTICAL REPORT

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Physical Tests (WATER)

		ALS ID		L2665711-1	L2665711-2
		Sampled Date		23-NOV-21	23-NOV-21
		Sampled Time		10:30	10:00
		Sample ID		SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Colour, True	CU	15	-	<5.0	<5.0
Conductivity	umhos/cm	-	-	536	284
Hardness (as CaCO ₃)	mg/L	-	-	266 ^{WTC}	77.2 ^{WTC}
Langkeller Index (4 C)	No Unit	-	-	0.59	<0.39
Langkeller Index (50 C)	No Unit	-	-	1.4	0.38
pH	pH units	7.00-10.5	-	8.05	7.57
Total Dissolved Solids	mg/L	500	-	322	115
Transmittance, UV (254 nm)	%T _{1cm}	-	-	94.5	98.4
Turbidity	NTU	-	-	2.11	<0.10

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

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

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

Anions and Nutrients (WATER)

		ALS ID		L2665711-1	L2665711-2
		Sampled Date		23-NOV-21	23-NOV-21
		Sampled Time		10:30	10:00
		Sample ID		SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Alkalinity, Total (as CaCO ₃)	mg/L	-	-	243	87.2
Ammonia, Total (as N)	mg/L	-	-	0.185	<0.010
Bicarbonate (HCO ₃)	mg/L	-	-	296	106
Bromide (Br)	mg/L	-	-	0.032	<0.010
Carbonate (CO ₃)	mg/L	-	-	<0.60	<0.60
Chloride (Cl)	mg/L	250	-	3.44	2.31
Fluoride (F)	mg/L	-	1.5	0.116	0.033
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Nitrate (as N)	mg/L	-	10	<0.0050	<0.0050
Nitrite (as N)	mg/L	-	1	<0.0010	<0.0010
Sulfate (SO ₄)	mg/L	500	-	52.3	14.8

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

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

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

Organic / Inorganic Carbon (WATER)

		ALS ID		L2665711-1	L2665711-2
		Sampled Date		23-NOV-21	23-NOV-21
		Sampled Time		10:30	10:00
		Sample ID		SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Dissolved Organic Carbon	mg/L	-	-	2.36 ^{WTC}	1.24 ^{WTC}
Total Organic Carbon	mg/L	-	-	1.50 ^{WTC}	0.74 ^{WTC}

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

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

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

- ☐ Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
☐ Analytical result for this parameter exceeds Guide Limit listed on this report.
 * Please refer to the Reference Information section for an explanation of any qualifiers noted.

Water Chemistry (continued)



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Total Metals (WATER)

Analyte	Unit	ALS ID		L2665711-1	L2665711-2	L2665711-3
		Guide	Guide	23-NOV-21	23-NOV-21	23-NOV-21
		Unit #1	Unit #2	Sampled Date	Sampled Date	Sampled Date
		Unit #1	Unit #2	Sample ID	Sample ID	Sample ID
		Unit #1	Unit #2	REGIONAL 1 -	REGIONAL 2 -	REGIONAL 3 -
		Unit #1	Unit #2	RAW	TREATED	DISTRIBUTION
Aluminum (Al)-Total	mg/L	0.1	2.9	<0.0030	<0.0030	0.0120
Antimony (Sb)-Total	mg/L	-	0.005	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	-	0.01	0.00176	0.00033	0.00032
Barium (Ba)-Total	mg/L	-	2	0.0977	0.0288	0.0211
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	0.044	0.036	0.038
Cadmium (Cd)-Total	mg/L	-	0.005	<0.000050	<0.000050	<0.000050
Calcium (Ca)-Total	mg/L	-	-	70.5	20.2	21.9
Cesium (Cs)-Total	mg/L	-	-	<0.000010	<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.00014	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	1	2	<0.00050	0.00404	0.0202
Iron (Fe)-Total	mg/L	0.3	-	0.281	<0.010	<0.010
Lead (Pb)-Total	mg/L	-	0.005	<0.000050	0.000057	0.000082
Lithium (Li)-Total	mg/L	-	-	0.0208	0.0071	0.0074
Magnesium (Mg)-Total	mg/L	-	-	22.0	5.53	5.55
Manganese (Mn)-Total	mg/L	0.02	0.12	0.0436	0.00138	0.00142
Molybdenum (Mo)-Total	mg/L	-	-	0.000989	0.000253	0.000229
Nickel (Ni)-Total	mg/L	-	-	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	-	-	0.043	0.209	0.393
Potassium (K)-Total	mg/L	-	-	2.58	0.955	0.955
Rubidium (Rb)-Total	mg/L	-	-	0.00136	0.00053	0.00054
Selenium (Se)-Total	mg/L	-	0.05	0.000105	<0.000050	0.000065
Silicon (Si)-Total	mg/L	-	-	12.9	3.94	3.93
Silver (Ag)-Total	mg/L	-	-	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	200	-	12.2	13.5	13.8
Strontium (Sr)-Total	mg/L	-	7	0.199	0.0588	0.0585
Sulfur (S)-Total	mg/L	-	-	15.4	5.51	5.32
Tellurium (Te)-Total	mg/L	-	-	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-	<0.000010	<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 (M&R, 2021)

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

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

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Water Chemistry (continued)



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Total Metals (WATER)

Analyte	Unit	ALS ID		L2665711-1	L2665711-2	L2665711-3
		Guide Limit #1	Guide Limit #2	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID	Sampled Date Sampled Time Sample ID
Titanium (Ti)-Total	mg/L	-	-	23-NOV-21 10:30 SOUTH CENTRAL REGIONAL 1 - RAW	23-NOV-21 10:00 SOUTH CENTRAL REGIONAL 2 - TREATED	23-NOV-21 11:00 SOUTH CENTRAL REGIONAL 3 - DISTRIBUTION
Tungsten (W)-Total	mg/L	-	-	<0.00030	<0.00030	<0.00030
Uranium (U)-Total	mg/L	-	0.02	<0.00010	<0.00010	<0.00010
Vanadium (V)-Total	mg/L	-	-	0.00134	0.000389	0.000389
Zinc (Zn)-Total	mg/L	5	-	<0.00050	<0.00050	<0.00050
Zirconium (Zr)-Total	mg/L	-	-	<0.0030	<0.0030	0.0034
				<0.00020	<0.00020	<0.00020

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

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

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

Volatile Organic Compounds (WATER)

Analyte	Unit	ALS ID		L2665711-1
		Guide Limit #1	Guide Limit #2	Sampled Date Sampled Time Sample ID
Benzene	mg/L	-	0.005	23-NOV-21 10:30 SOUTH CENTRAL REGIONAL 1 - RAW
1,1-dichloroethene	mg/L	-	0.014	<0.00050
Dichloromethane	mg/L	-	0.05	<0.00050
Ethylbenzene	mg/L	0.0016	0.14	<0.00050
MTBE	mg/L	0.015	-	<0.00050
Tetrachloroethene	mg/L	-	0.01	<0.00050
Toluene	mg/L	0.024	0.06	<0.00050
Trichloroethene	mg/L	-	0.005	<0.00050
o-Xylene	mg/L	-	-	<0.00050
m+p-Xylenes	mg/L	-	-	<0.00040
Xylenes (Total)	mg/L	0.02	0.09	<0.00054
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-	90.7
Surrogate: 1,4-Difluorobenzene (SS) %		-	-	101.5

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

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

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

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Appendix B

Water Treatment Plant Process Diagram

Process Schematics:

- Membrane Filtration**
- Greensand Filtration**

[illegible]

GREEN SAND FILTRATION:

