Public Water System Annual Report

-2017-

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 Operator: **Mr. Keith Klassen**

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

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

Date Prepared: March 2018

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1. Introduction:

The 2017 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 1600 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.

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.

Antiscalent 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 Treatment Plant is a Class 2 water treatment facility with a Class 1 water distribution system. The facility classifications are used to determine certification requirements for the water system operators. The full-time operator and relief operator have met the requirements for Class 1 Water Treatment and Class 1 Water Distribution certifications, and are working towards their Class 2 certification.

3. List of Water Quality Standards

The Province of Manitoba has adopted a number of water quality standards from the Health Canada *Guidelines for Canadian Drinking Water Quality*. 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 2017 for the South Central District Water System. Public water systems are required to monitor chlorine levels and undertake regular bacterial testing. The South Central District system met all requirements for water quality standards and monitoring requirements in 2017 and is fulfilling the requirements of their Operating Licence.

4. Water System Incidents and Corrective Actions

There were no major water system incidents in 2017. 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 2017.

7. Future System Expansion

There is a plan in place to install a generator with automatic transfer switch and new backup pump at the Manitou reservoir in 2018.

Appendix A

Results of Water Chemistry, Bacterial and Chlorine Residual Analysis

Chlorine Residual and TC/EC Analyses

Collection Date	Sample Identification	TC	EC	CL2 Free	CL2 Total
04-Jan-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	NDSF	NDSF	0.60	0.66
04-Jan-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	NDSF	NDSF	1.17	1.20
10-Jan-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
10-Jan-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.71	0.85
11-Jan-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.72	0.78
11-Jan-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.24	1.28
23-Jan-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.65	0.64
23-Jan-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.40	1.48
24-Jan-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	1	0	na	na
24-Jan-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.87
06-Feb-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.65	0.76
06-Feb-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.17	1.24
07-Feb-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
07-Feb-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.67	0.84
21-Feb-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.70	0.73
21-Feb-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.21	1.28
21-Feb-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
21-Feb-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.68	0.79
06-Mar-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.66	0.73
06-Mar-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.18	1.23
08-Mar-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
08-Mar-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.77	0.88
21-Mar-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.78
21-Mar-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.54	1.74
21-Mar-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
21-Mar-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.86
03-Apr-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.78	0.75
03-Apr-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.52	1.49
04-Apr-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
04-Apr-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.78	0.92
11-Apr-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
18-Apr-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
18-Apr-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.70	0.81
24-Apr-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.70	0.78
24-Apr-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.67	1.75

Chlorine Residual and TC/EC Analyses (continued)

Collection Date	Sample Identification	TC	EC	CL2 Free	CL2 Total
02-May-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
02-May-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.78	0.91
08-May-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.63	0.75
08-May-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.42	1.55
16-May-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
16-May-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.67	0.81
23-May-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.62	0.71
23-May-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.14	1.27
30-May-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
30-May-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.72	0.81
05-Jun-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.75	0.73
05-Jun-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.24	1.32
13-Jun-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
13-Jun-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.78	0.86
19-Jun-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.64	0.68
19-Jun-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.30	1.41
27-Jun-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
27-Jun-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.69	0.79
04-Jul-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.74	0.77
04-Jul-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.13	1.18
11-Jul-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.82	0.91
17-Jul-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.85	0.79
17-Jul-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.23	1.34
25-Jul-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
25-Jul-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.75	0.85
31-Jul-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.70	0.72
31-Jul-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.26	1.36
08-Aug-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
08-Aug-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.80	0.90
14-Aug-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.67	0.77
14-Aug-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.07	1.11
22-Aug-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
22-Aug-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.77	0.90
28-Aug-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.77
28-Aug-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.26	1.35
05-Sep-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
05-Sep-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.80	0.91
11-Sep-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.58	0.70

Chlorine Residual and TC/EC Analyses (continued)

Collection Date	Sample Identification	TC	EC	CL2 Free	CL2 Total
11-Sep-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.78	0.89
19-Sep-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
19-Sep-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.82	0.93
25-Sep-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.77
25-Sep-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.16	1.25
03-Oct-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
03-Oct-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.80	0.91
10-Oct-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.65	0.71
10-Oct-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.20	1.26
16-Oct-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
16-Oct-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.76	0.92
25-Oct-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.73	0.80
25-Oct-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.93	1.02
31-Oct-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
31-Oct-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.81	0.91
07-Nov-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.68	0.75
07-Nov-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.24	1.21
14-Nov-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
14-Nov-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.86	1.01
20-Nov-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.79	0.83
20-Nov-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	0.75	0.86
28-Nov-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
28-Nov-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.89	1.00
04-Dec-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.65	0.73
04-Dec-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.19	1.26
12-Dec-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
12-Dec-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.81	0.95
18-Dec-17	SOUTH CENTRAL REGIONAL - MANITOU INCOMING	0	0	0.69	0.77
18-Dec-17	SOUTH CENTRAL REGIONAL - MANITOU OUTGOING	0	0	1.01	1.12
27-Dec-17	SOUTH CENTRAL REGIONAL - PILOT MOUND RAW	0	0	na	na
27-Dec-17	SOUTH CENTRAL REGIONAL - PILOT MOUND TREATED	0	0	0.81	0.95

Notes:

CL2: Reported in units of mg/L

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

NDSF: No Data - Sample Received Frozen

Water Chemistry

ALS Environmental

ANALYTICAL REPORT

Physical Tests (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID	L1914601-1	L1914601-2
				Sampled Date	18-APR-17	18-APR-17
				Sampled Time	12:45	13:15
				Sample ID	SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Colour, True	CU	15	-		<5.0	<5.0
Conductivity	umhos/cm	-	-		552	217
Hardness (as CaCO3)	mg/L	-	-		287 HTC	83.2 HTC
Langelier Index (4 C)	No Unit	-	-		0.43	-0.35
Langelier Index (60 C)	No Unit	-	-		1.2	0.43
pH	pH units	7.00-10.5	-		7.79	7.89
Total Dissolved Solids	mg/L	500	-		362	128
Transmittance, UV (254 nm)	%T/cm	-	-		94.2	98.2
Turbidity	NTU	-	-		2.63	0.18

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Anions and Nutrients (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID	L1914601-1	L1914601-2
				Sampled Date	18-APR-17	18-APR-17
				Sampled Time	12:45	13:15
				Sample ID	SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-		274	106
Ammonia, Total (as N)	mg/L	-	-		0.135	<0.010
Bicarbonate (HCO3)	mg/L	-	-		335	129
Bromide (Br)	mg/L	-	-		<0.10	<0.10
Carbonate (CO3)	mg/L	-	-		<0.60	<0.60
Chloride (Cl)	mg/L	250	-		2.65	1.98
Fluoride (F)	mg/L	-	1.5		0.092	0.032
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 (SO4)	mg/L	500	-		34.6	9.90

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Organic / Inorganic Carbon (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID	L1914601-1	L1914601-2
				Sampled Date	18-APR-17	18-APR-17
				Sampled Time	12:45	13:15
				Sample ID	SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Dissolved Organic Carbon	mg/L	-	-		1.52	<0.50
Total Organic Carbon	mg/L	-	-		1.45	<0.50

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

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)

Total Metals (WATER)

				ALS ID	L1914601-1	L1914601-2
				Sampled Date	18-APR-17	18-APR-17
				Sampled Time	12:45	13:15
				Sample ID	SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL REGIONAL 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2			
Aluminum (Al)-Total	mg/L	0.1	-		<0.0050	<0.0050
Antimony (Sb)-Total	mg/L	-	0.006		<0.00020	<0.00020
Arsenic (As)-Total	mg/L	-	0.01		0.00193	0.00063
Barium (Ba)-Total	mg/L	-	1		0.103	0.0222
Beryllium (Be)-Total	mg/L	-	-		<0.00020	<0.00020
Bismuth (Bi)-Total	mg/L	-	-		<0.00020	<0.00020
Boron (B)-Total	mg/L	-	5		0.048	0.037
Cadmium (Cd)-Total	mg/L	-	0.005		<0.000010	<0.000010
Calcium (Ca)-Total	mg/L	-	-		78.4	22.5
Cesium (Cs)-Total	mg/L	-	-		<0.00010	<0.00010
Chromium (Cr)-Total	mg/L	-	0.05		<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	-	-		<0.00020	<0.00020
Copper (Cu)-Total	mg/L	1	-		<0.00020	0.00365
Iron (Fe)-Total	mg/L	0.3	-		0.347	<0.010
Lead (Pb)-Total	mg/L	-	0.01		<0.000090	<0.000090
Lithium (Li)-Total	mg/L	-	-		0.0204	0.0069
Magnesium (Mg)-Total	mg/L	-	-		22.1	6.54
Manganese (Mn)-Total	mg/L	0.05	-		0.463	0.00245
Molybdenum (Mo)-Total	mg/L	-	-		0.00091	<0.00020
Nickel (Ni)-Total	mg/L	-	-		<0.0020	<0.0020
Phosphorus (P)-Total	mg/L	-	-		<0.10	<0.10
Potassium (K)-Total	mg/L	-	-		2.92	1.15
Rubidium (Rb)-Total	mg/L	-	-		0.00150	0.00060
Selenium (Se)-Total	mg/L	-	0.05		<0.0010	<0.0010
Silicon (Si)-Total	mg/L	-	-		13.5	4.00
Silver (Ag)-Total	mg/L	-	-		<0.00010	<0.00010
Sodium (Na)-Total	mg/L	200	-		12.4	15.4
Strontium (Sr)-Total	mg/L	-	-		0.203	0.0579
Tellurium (Te)-Total	mg/L	-	-		<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-		<0.00010	<0.00010
Thorium (Th)-Total	mg/L	-	-		<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-		<0.00020	<0.00020
Titanium (Ti)-Total	mg/L	-	-		<0.00050	<0.00050

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

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)

Total Metals (WATER)

				ALS ID	L1914601-1	L1914601-2
				Sampled Date	18-APR-17	18-APR-17
				Sampled Time	12:45	13:15
				Sample ID	SOUTH CENTRAL REGIONAL 1 - RAW	SOUTH CENTRAL 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		0.00190	0.00052
Vanadium (V)-Total	mg/L	-	-		<0.00020	<0.00020
Zinc (Zn)-Total	mg/L	5	-		<0.0020	<0.0020
Zirconium (Zr)-Total	mg/L	-	-		<0.00040	<0.00040

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Volatile Organic Compounds (WATER)

				ALS ID	L1914601-1
				Sampled Date	18-APR-17
				Sampled Time	12:45
				Sample ID	SOUTH CENTRAL REGIONAL 1 - RAW
Analyte	Unit	Guide Limit #1	Guide Limit #2		
Benzene	mg/L	-	0.005		<0.00050
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	-	-		<0.00050
Xylenes (Total)	mg/L	0.02	0.09		<0.00071
Surrogate: 4-Bromofluorobenzene (SS)	%	-	-		75.2
Surrogate: 1,4-Difluorobenzene (SS)	%	-	-		87.0

Federal Guidelines for Canadian Drinking Water Quality (MAR, 2015)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

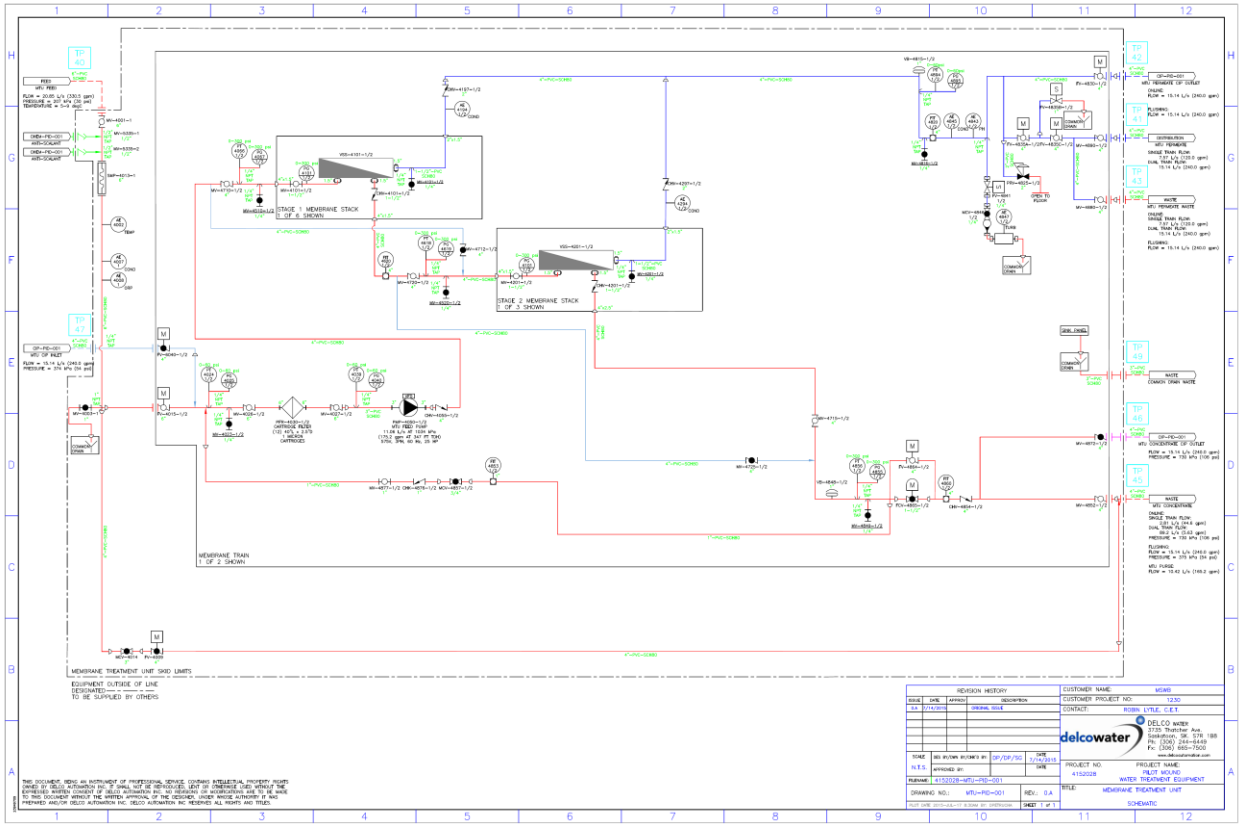
Detection Limit for result exceeds Guide Limit. Assessment against Guide Limit cannot be made.
Analytical result for this parameter exceeds Guide Limit listed on this report.
* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Appendix B

Water Treatment Plant Process Diagram

Process Schematic –

Membrane Filtration



Process Schematic –
Green Sand Filtration