Rural Municipality of St. Clements

East Selkirk Water Treatment Plant Annual Report for 2019

January 21st, 2020

Prepared by: Rural Municipality of St. Clements
1043 Kittson Road, East Selkirk
Manitoba, R0E 0M0

Municipal Services – RM of St. Clements Annual Water Report

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Municipal Services – RM of St. Clements Annual Water Report

1.0 Description of the Water System:

The St. Clements Water system provides potable drinking water since October 2012 to a population of approximately 675 residents plus commercial businesses and schools. Treated water produced from the East Selkirk Water Treatment Plant located in the village of East Selkirk meets all health and aesthetic objectives as stated in the Canadian Drinking Water Quality Guidelines.

1.1 Water Supply Source:

The St. Clements Water Treatment Plant (WTP) sources its supply with two pumps from the lower carbonate aquifer. These two well pumps can pump 13 liters per second at 30.5 meters TDH (Total Dynamic Head).

1.2 IntakeStructure:

The intake structure consists of two 250mm dia. Well with PVC plastic casing, approximately 65 meters deep.

1.3 Water Treatment process:

The St. Clements WTP is distributing water by passing through UV system (Trojan 2000 UV Model) for primary disinfection and by a 12% sodium hypochlorite solution injected into raw water (2 alternating units), with appropriate reservoir contact time for microbiological inactivation.

1.4 Distribution System:

Treated water from the reservoir is pumped throughout the St. Clements distribution system via 4 pumps. The distribution system has an approximate pipe length of 11.8 kilometers. Piping is comprised of HDPE (high density polyethylene). Water mains range between 150mm to 250mm diameter. System includes stand-by diesel-electric generator (with 200L fuel tank) that tests bi-weekly for 15mins, testing is normally performed during weekday daylight hours. C/W a magnetic flow meter at distribution header.

Pump condition points are as follows:

Well Pump WP1 & WP2: 13 L/s at 30.5 meters TDH (5.6 kilowatts)

Jockey Pump JP1: 2.5 L/s at 56 meters TDH (2.2 kilowatts)

Domestic Pump DP1 through DP3: 10.1 L/s at 56 meters TDH (11 kilowatts)

Emergency Pump EP1: 60 l/S at 56 meters TDH (45 kilowatts)

1.5 Storage Reservoir:

The WTP has a reinforced concrete reservoir, 1.0 meter above ground, and 3.6 meters below ground with a capacity of 600 cubic meters (2 – 250,000 cells). The Water Treatment Structure sits atop of the reservoir.

1.6 Number of connections, population served and types of water users:

The St. Clements distribution system is comprised of 275 service connections serving a population approximately 675 residents. These services are almost entirely residential. There are only a small number of minor commercial establishments and no industry. Two public schools are also serviced by the Water Treatment Plant. The Water Treatment Plant can accommodate approximately 600 service connections with the infill of existing areas and new developments.

1.7 Classification and Certification:

-Class 1 Water Treatment Facility, Class 1 Water Distribution.

-Certification level of Operators:

- Darren Otto; Licensed Operator Class 1
- Darcy Henderson; Licensed Operator Class 1
- Greg Elson; Licensed Operator Class 2

2.0 Disinfection System in Use:

The final step in the treatment of safe water is disinfection. Disinfection is the selective destruction or inactivation of potential disease causing organisms in water. As per the Drinking Water Safety Act the St. Clements water system must ensure that a disinfectant residual of at least:
0.5mg of free chlorine per liter of water is detectable at the point where water enters the distribution system, after a minimum contact time of 20 minutes.
0.1mg of free chlorine per liter of water is detectable at all times at any point in the distribution network.

2.1 Equipment redundancy and monitoring requirements:

As required by the Drinking Water Safety Act the St. Clements WTP ensures continuous disinfection is maintained at the plant by keeping in stock all spare parts required for the chlorinator. As additional backup, a complete spare chlorinator system is also kept at the plant.

2.2 Disinfectant residual overall performance/results:

For 2019, the St. Clements Water System has met all regulatory requirements in regard to monitoring and reporting disinfection residuals leaving the water treatment plant and in the distribution system.

3.0 List of Water Quality Standards:

The Province of Manitoba had adopted a number of water quality standards from the Guidelines for Canadian Drinking Water Quality, developed by Health Canada. The Parameters are health-based and they express the maximum acceptable concentration for a groundwater supply source. Concentration values in excess constitute a health-related issue and require corrective actions. The 2019 results for the St. Clements Water System are summarized in the following table:

Parameter	Monitoring Requirements
Bacteriological (total coliform and E. coli)	Bi-weekly sampling program with each set of samples consisting of one raw, one treated and a minimum of one distribution sample. Consecutive sample sets to be separated by at least 12 days.
Free chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time.
Free chlorine (distribution system)	At the same time and location(s) as bacteriological distribution system sampling.
Total chlorine (treated water)	One sample per day of water entering the distribution system following at least 20 minutes of contact time.
Total chlorine (distribution system)	At the same times and location(s) as bacteriological distribution system sampling.
Ultraviolet Disinfection	Continuous monitoring of UV intensity level for each operating UV unit.
General chemistry	One raw and one treated water sample once every three years.
Nitrite and nitrate (treated water)	At a frequency specified by the Drinking Water Officer.
Lead	As per the instructions of the Drinking Water Officer.

*All lab testing done by ALS Environmental, summation available upon request.

4.0 Water System Incidents and Corrective Actions:

All/any Incidents and Corrective action reports were filed with Manitoba Sustainable Development as per the Guidelines for Canadian Drinking Water Quality.

5.0 Drinking Water Safety Orders on your System and Actions Taken in Response:

In 2019 no Drinking Water Safety Orders were issued for the RM of St. Clements Water System.

6.0 Boil Water Advisories Issued and Actions Taken in Response:

In 2019 no Boil Water Advisories were issued for the RM of St. Clements Water System.

7.0 Warnings or Charges Laid on the System in Accordance with The Drinking Water Safety Act:

In Accordance with the Drinking Water Safety Act, no warnings or charges were issued for the St. Clements Water System in 2019. See attached Annual Compliance Audit from Manitoba Sustainable Development.

8.0 Monthly Chlorination Report

Month	Average per month of Chlorine Residual in mg/L		Lowest Free Chlorine during month (mg/L)
	Free Chlorine	Total Chlorine	
January	1.10	1.19	0.71
February	1.13	1.29	0.59
March	1.28	1.44	0.99
April	1.12	1.33	0.82
May	0.96	1.21	0.58
June	0.95	1.32	0.72
July	1.06	1.44	0.87
August	0.98	1.32	0.81
September	0.96	1.28	0.70
October	0.99	1.38	0.88
November	1.03	1.41	0.88
December	1.03	1.38	0.81

***Supporting data can be made available upon request.**

9.0 Monthly Effluent Rate Report

Month	Amount (m3)
January	4,661
February	4,309
March	3,800
April	3,457
May	3,646
June	3,849
July	3,917
August	3,724
September	3,679
October	3,704
November	3,730
December	3,829
Total m3 this year	**46,305**
Average m3 per month	**3,859**

***Supporting data can be made available upon request.**

10.0 Annual Compliance Audit - Manitoba Sustainable Development

Manitoba
Conservation and Climate
Office of Drinking Water
1007 Century Street
Winnipeg MB, R3H 0W4
T 204-794-1435 F 204-945-1365
Avery.Keats@gov.mb.ca
http://www.manitoba.ca/drinkingwater

January 14, 2020 PWS: 57.25

Rural Municipality of St. Clements
c/o Greg Elson, Public Works Manager
Box 2 Group 35 RR1
East Selkirk, MB R0E 1M0

Via email Pwmanager@rmofstclements.com

2019 Annual Compliance Audit

Dear Greg Elson:

Please find enclosed the 2019 Annual Compliance Audit for the East Selkirk public water system (PWS). The report compares water system compliance to The Drinking Water Safety Act and its supporting regulations, and the terms and conditions of the water system's current operating licence (PWS-13-523).

Where non-compliance items are identified, the issues do not necessarily translate into increased public health risk. The Office of Drinking Water uses processes, including boil water advisories, to notify water users of a public health risk.

Please review the following terms and conditions of your operating licence to ensure ongoing compliance:

- Water quality sampling frequencies identified in *Table 2*.
- Water System Assessment (due date: March 1, 2024).

Facility Classification and Operator Certification
In 2020, Conservation and Climate will be enforcing on the Water and Wastewater Facility Operators Regulation MR. 77/2003 beginning with Public Water Systems classified at Level 3 and Level 4 Water Treatment Facilities and Water Distribution. The focus will be on operator certification and submission of an up-to-date Table of Organization.

Operational Guidelines
Water suppliers are reminded to immediately notify the Office of Drinking Water of any condition(s) that may affect the ability of the water system to produce or deliver safe drinking water. These conditions include:

- treatment upsets, bypass conditions, operation outside of licence conditions
- contamination of source or treated water

- a disinfection, filtration, or distribution system failure

Operational Guidelines to assist operators in meeting regulatory obligations for monitoring and reporting under The Drinking Water Safety Act, including Seasonal System and Emergency Reporting requirements, can be found on our website at: www.gov.mb.ca/drinkingwater.

Additional Information

Health Canada has updated National Guidelines, including algae (cyanobacteria toxins) manganese and lead. Owners and operators are encouraged to review Health Canada's guidelines and related chemistry results to determine what impact they may have on your water supply. You will receive notification of any changes to Health Canada's Guidelines for Canadian Drinking Water Quality and Manitoba Standards should they affect your water supply.

The 2019 Annual Compliance Audit is based on information submitted to this office. If you have questions regarding non-compliance items identified in this audit, please review your records prior to contacting this office. If your records conflict with the audit information, please call me at (204) 794-1435.

Sincerely,

Original copy signed by

Avery Keats
Regional Drinking Water Officer

Enclosures

11.0 Annual Compliance Report - Manitoba Sustainable Development

2019 Annual Compliance Audit

Water System: EAST SELKIRK - PWS
Code: 57.25
Water System Owner: Rural Municipality of St. Clements

Water System Operating Licence: PWS-13-523 Expiry Date: November 30, 2017

1) This report documents the East Selkirk Public Water System compliance for the period from January 1 to December 31, 2019.

2) Addendum A to this report provides specific information on the non-compliance incidents identified in the summary below.

3) Other than the information provided in attached Addendum A, the water supplier has complied with *The Drinking Water Safety Act,* its supporting regulations, and the terms and conditions of the water system's current operating licence

4) This report is based on information submitted by the water supplier, agents of the water supplier, and / or the Province of Manitoba.

Summary of Non-Compliance Incidents:

None reported

Addendum A: Record of Non-Compliance
Water System: EAST SELKIRK - PWS
Report period: January 1, 2019 to December 31, 2019.

Enforcement Action Taken

Date	Incident	Outcome
	None reported	

Disinfection Requirements

Date	Incident	Outcome
	None reported	

Bacteriological Requirements

Date	Incident	Outcome
	None reported	

Microbial Requirements

Date	Incident	Outcome
	None reported	

Turbidity Requirements

Date	Incident	Outcome
	None reported	

Chemical Requirements

Date	Incident	Outcome
	None reported	

Operational Requirements

Date	Incident	Outcome
	None reported	

Office of Drinking Water
ATTN: NANCY FITZGERALD
Box 6000,
75 - 7th Avenue
Gimli MB R0C 0M0

Date Received: 11-JUN-18
Report Date: 27-JUN-18 13:42 (MT)
Version: FINAL

Client Phone: 204-641-3530

Certificate of Analysis

Lab Work Order #: L2109939

Project P.O. #:	NOT SUBMITTED
Job Reference:	EAST SELKIRK PWS 57.25
C of C Numbers:	
Legal Site Desc:	51416

Lee-Ann Hemphill B.Sc
Biology Manager

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ANALYTICAL REPORT

Physical Tests (WATER)

Analyte	Unit	Guide Limit #1	Guide Limit #2	ALS ID: L2109939-1 Sampled Date: 11-JUN-18 Sampled Time: 10:00 Sample ID: EAST SELKIRK 1 - RAW	ALS ID: L2109939-2 Sampled Date: 11-JUN-18 Sampled Time: 10:15 Sample ID: EAST SELKIRK 2 - TREATED
Colour, True	CU	15	-	<5.0	<5.0
Conductivity	umhos/cm	-	-	979	985
Hardness (as CaCO3)	mg/L	-	-	558 HTC	574 HTC
Langelier Index (4 C)	No Unit	-	-	0.66	0.74
Langelier Index (60 C)	No Unit	-	-	1.4	1.5
pH	pH units	7.00-10.5	-	7.79	7.87
Total Dissolved Solids	mg/L	500	-	604	618
Transmittance, UV (254 nm)	%T/cm	-	-	90.4	90.0
Turbidity	NTU	-	-	<0.10	<0.10

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#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: L2109939-1 Sampled Date: 11-JUN-18 Sampled Time: 10:00 Sample ID: EAST SELKIRK 1 - RAW	ALS ID: L2109939-2 Sampled Date: 11-JUN-18 Sampled Time: 10:15 Sample ID: EAST SELKIRK 2 - TREATED
Alkalinity, Total (as CaCO3)	mg/L	-	-	495	498
Ammonia, Total (as N)	mg/L	-	-	0.015	0.011
Bicarbonate (HCO3)	mg/L	-	-	603	607
Bromide (Br)	mg/L	-	-	0.026	0.022
Carbonate (CO3)	mg/L	-	-	<0.60	<0.60
Chloride (Cl)	mg/L	250	-	27.6	29.5
Fluoride (F)	mg/L	-	1.5	0.237	0.239
Hydroxide (OH)	mg/L	-	-	<0.34	<0.34
Iodide (I)	mg/L	-	-	<2.0	<2.0
Nitrate (as N)	mg/L	-	10	7.54	7.08
Nitrite (as N)	mg/L	-	1	<0.0020 DLM	0.0165
Total Kjeldahl Nitrogen	mg/L	-	-	0.49 TKNI	0.51 TKNI
Total Nitrogen	mg/L	-	-	0.49	0.51
Sulfate (SO4)	mg/L	500	-	51.8	54.2
Anion Sum	me/L	-	-	12.3	12.4
Cation Sum	me/L	-	-	12.1	12.5
Cation - Anion Balance	%	-	-	-1.0	0.4

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
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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

Organic / Inorganic Carbon (WATER)

				ALS ID	L2109939-1	L2109939-2
				Sampled Date	11-JUN-18	11-JUN-18
				Sampled Time	10:00	10:15
				Sample ID	EAST SELKIRK 1 - RAW	EAST SELKIRK 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2			
Dissolved Organic Carbon	mg/L	-	-		2.42	2.15
Total Inorganic Carbon	mg/L	-	-		99.8	98.9
Total Organic Carbon	mg/L	-	-		2.23	2.04

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ALS Environmental

ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2109939-1	L2109939-2
				Sampled Date	11-JUN-18	11-JUN-18
				Sampled Time	10:00	10:15
				Sample ID	EAST SELKIRK 1 - RAW	EAST SELKIRK 2 - TREATED
Analyte	Unit	Guide Limit #1	Guide Limit #2			
Aluminum (Al)-Total	mg/L	0.1	-		0.0032	0.0139
Antimony (Sb)-Total	mg/L	-	0.006		<0.00010	0.00039
Arsenic (As)-Total	mg/L	-	0.01		0.00013	0.00019
Barium (Ba)-Total	mg/L	-	1		0.0583	0.0599
Beryllium (Be)-Total	mg/L	-	-		<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-		<0.000050	0.000081
Boron (B)-Total	mg/L	-	5		0.088	0.092
Cadmium (Cd)-Total	mg/L	-	0.005		0.0000071	0.0000195
Calcium (Ca)-Total	mg/L	-	-		82.7	81.8
Cesium (Cs)-Total	mg/L	-	-		<0.000010	<0.000010
Chromium (Cr)-Total	mg/L	-	0.05		<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-		<0.00010	0.00084
Copper (Cu)-Total	mg/L	1	2		0.00156	0.388
Iron (Fe)-Total	mg/L	0.3	-		<0.010	<0.010
Lead (Pb)-Total	mg/L	-	0.01		0.000145	0.00117
Lithium (Li)-Total	mg/L	-	-		0.0657	0.0685
Magnesium (Mg)-Total	mg/L	-	-		85.2	89.8
Manganese (Mn)-Total	mg/L	0.05	-		0.00047	0.00185
Molybdenum (Mo)-Total	mg/L	-	-		0.00175	0.00168
Nickel (Ni)-Total	mg/L	-	-		0.00119	1.08
Phosphorus (P)-Total	mg/L	-	-		<0.050	<0.050
Potassium (K)-Total	mg/L	-	-		4.25	4.52
Rubidium (Rb)-Total	mg/L	-	-		0.00173	0.00205
Selenium (Se)-Total	mg/L	-	0.05		0.00280	0.00324
Silicon (Si)-Total	mg/L	-	-		7.76	7.72
Silver (Ag)-Total	mg/L	-	-		<0.000010	0.000012
Sodium (Na)-Total	mg/L	200	-		18.6	21.8
Strontium (Sr)-Total	mg/L	-	-		0.472	0.455
Tellurium (Te)-Total	mg/L	-	-		<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	-	-		0.000011	0.000016
Thorium (Th)-Total	mg/L	-	-		<0.00010	<0.00010
Tin (Sn)-Total	mg/L	-	-		<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-		<0.00030	<0.00030

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ANALYTICAL REPORT

Total Metals (WATER)

				ALS ID	L2109939-1	L2109939-2
				Sampled Date	11-JUN-18	11-JUN-18
				Sampled Time	10:00	10:15
				Sample ID	EAST SELKIRK 1 - RAW	EAST SELKIRK 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		0.0125	0.0122
Vanadium (V)-Total	mg/L	-	-		<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	5	-		0.0059	0.162
Zirconium (Zr)-Total	mg/L	-	-		<0.000060	0.000137

Federal Guidelines for Canadian Drinking Water Quality (FEB, 2017)
#1: GCDWQ - Aesthetic Objective/Other Value
#2: GCDWQ - Maximum Acceptable Concentrations (MACs)

Volatile Organic Compounds (WATER)

				ALS ID	L2109939-1
				Sampled Date	11-JUN-18
				Sampled Time	10:00
				Sample ID	EAST SELKIRK 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
1,1,1,2-Tetrachloroethane	mg/L	-	-		<0.00050
1,1,2,2-Tetrachloroethane	mg/L	-	-		<0.00050
Tetrachloroethene	mg/L	-	0.01		<0.00050
Toluene	mg/L	0.024	0.06		<0.00050
1,1,1-Trichloroethane	mg/L	-	-		<0.00050
1,1,2-Trichloroethane	mg/L	-	-		<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		<0.00064

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END OF MANITOBA SUSTAINABLE DEVELOPMENT REPORT